California State University San Marcos Extended Learning Building

Initial Study / Mitigated Negative Declaration

March 2016

Prepared for

California State University San Marcos
Planning, Design and Construction
333 South Twin Oaks Valley Road
Craven Hall 5111
San Marcos, California 92096

Prepared by:

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Contents

Appendices

Figures

Tables

1.0 Mitigated Negative Declaration

Subject: California State University San Marcos Extended Learning Building

I. Project Description: The proposed project would construct a new Extended Learning (EL) Building on the California State University San Marcos (CSUSM) campus to support the growing needs of the EL Department by providing new instructional space for EL program courses, as well as co-locating other EL units to develop a more cohesive department. The new building would have a footprint of approximately 20,000 Square Feet (SF), include approximately 52,300 SF of useable space, and be three-stories (55 feet) in height. The new structure is planned to include offices, meeting/conference rooms, classrooms and lecture halls, computer labs, science labs, research space, and lab storage rooms. The proposed building's exterior design would be consistent with the existing materials, scale, and mass of surrounding campus buildings, including the adjacent Foundation Classroom Building (FCB). In the near-term, the project would serve the existing campus by relocating existing EL facilities. In the long-term (3-5 years), the proposed project would expand the EL Department and is anticipated to serve up to approximately 1,655 full-time equivalent students (FTES). The proposed project is consistent with the 1988 Master Plan for the CSUSM campus, which includes the provision of additional academic facilities on campus. The proposed project site is not included on any list of hazardous materials sites compiled pursuant to Government Code Section 65962.5.

II. Environmental Setting: See attached Initial Study.

III. Determination: The proposed project would result in potentially significant impacts associated with Aesthetics, Geology and Soils, Hydrology and Water Quality, Noise, Transportation/Traffic and Utilities and Service Systems. Mitigation measures would be implemented to reduce these impacts to a less than significant level.

IV. Documentation: The attached Initial Study documents the reasons to support the determination discussed above.

V. Mitigation Measures: See attached Mitigation Monitoring and Reporting Program.

VI. Public Review Distribution: The following individuals, organizations, and agencies received a copy or notice of the Draft Initial Study and Mitigated Negative Declaration and were invited to comment on its adequacy and sufficiency:

State of California
Department of Fish and Game, Region 5
Native American Heritage Commission
Department of Toxic Substances Control
Regional Water Quality Control Board, Region 9
Department of Transportation, District 11
State Clearinghouse

Local Agencies
City of San Marcos Development Services Department
San Marcos Fire Department
Vallecitos Water District
San Diego County Clerk's Office

Native American Bands
La Jolla Band of Mission Indians
Pala Band of Mission Indians
Pauma and Yuima Band of Mission Indians
Pechanga Band of Mission Indians
Rincon Band of Mission Indians
San Luis Rey Band of Mission Indians

Other
San Diego County Archaeological Society
San Diego Gas & Electric

VII. Results of Public Review:

( ) No comments were received during the public input period.

( ) Comments were received but did not address the Draft Mitigated Negative Declaration finding or the accuracy/completeness of the Initial Study. No response is necessary. The letters are attached.

( ) Comments addressing the findings of the Draft Mitigated Negative Declaration and/or accuracy or completeness of the Initial Study were received during the public input period. Responses were prepared to each letter. The letters and responses follow.

The Initial Study and Mitigated Negative Declaration are available for review on the CSUSM Planning, Design and Construction website at: www.csusm.edu/pdc.

Steve Ramirez

Steve Ramirez, Interim Director
Planning, Design & Construction
California State University San Marcos

3/30/2016
Date of Draft Report

Date of Final Report

2.0 Introduction

In conjunction with the existing 1988 Master Plan prepared by CRSS Architecture Group, CSUSM proposes to design and construct an approximately 52,300 SF EL Building and associated utilities infrastructure located in the southeastern portion of the CSUSM campus, east of Palm Canyon Drive, north of Parking Lots E and F, south of Parking Lot H.

2.1 California Environmental Quality Act Compliance

The California State University (CSU) Board of Trustees is the lead agency pursuant to the California Environmental Quality Act (CEQA) and is responsible for analyzing and approving the Mitigated Negative Declaration (MND) document for the proposed project. The Board of Trustees has determined that an MND is the appropriate environmental document to be prepared in compliance with CEQA. This finding is based on the Initial Study (IS) Checklist (Chapter 5.0) and Discussion of Environmental Impacts (Chapter 6.0). As provided for by CEQA Statute Section 21064.5, an MND may be prepared for a project subject to CEQA when the project will not result in significant environmental impacts that cannot be mitigated to a level below significance.

This IS/MND has been prepared by CSUSM, as the lead agency's agent, and in conformance with CEQA Guidelines Section 15070(a). The purpose of the IS/MND is to determine the potential significant impacts associated with the construction and operation of the proposed EL Building project on campus and incorporate mitigation measures into the project design as necessary to reduce or eliminate the significant or potentially significant effects.

2.2 Other Agencies That May Use the Mitigated Negative Declaration and Initial Study

This IS/MND is intended to be used by responsible and trustee agencies that may have review authority over the proposed project. CSUSM will obtain all permits as required by law. The Board of Trustees is the CEQA lead agency for the proposed project.

2.3 Public Review Process

In accordance with CEQA, a good faith effort has been made during preparation of this IS/MND to contact affected public agencies, organizations, and persons who may have an interest in the proposed project. In reviewing the Draft IS/MND, affected and interested parties should focus on the sufficiency of the document in identifying and analyzing the possible impacts on the environment and ways in which the significant effects of the proposed project would be avoided or mitigated.

The Draft IS/MND and associated appendices will be available for review on the CSUSM Planning, Design and Construction website at www.csusm.edu/pdc.

Comments made on the Draft IS/MND in writing during the 30-day comment period (March 30, 2016 and end on April 29, 2016) were responded to in the Responses to Public Comments section of the Final IS/MND. Written comments on the Draft IS/MND were submitted to:

Steve Ramirez, Interim Director
Planning, Design and Construction
California State University San Marcos
333 South Twin Oaks Valley Road, Craven Hall 5111
San Marcos, CA 92096-0001
Fax: (760) 750-4656

The Board of Trustees will consider the Final IS/MND and the comments thereto in determining whether to approve the proposed project. Board of Trustees meetings are held every two months at the CSU Chancellor's Office (401 Golden Shore, Long Beach, CA 90802). Please contact the CSU Capital Planning, Design and Construction office at (562) 951-4093 to confirm the date/time of the agenda item for the proposed project.

2.4 Incorporated by Reference

According to Section 15150 of the CEQA Guidelines, an MND may incorporate by reference all or portions of another document which is a matter of public record. The incorporated language shall be considered to be set forth in full as part of the text of the MND. Because the proposed project is identified in the 1988 Master Plan for the CSUSM campus, the 1988 Master Plan Environmental Impact Report (EIR) prepared by LSA Associates, Inc. is hereby incorporated by reference. Background information and analysis from the 1988 Master Plan EIR was referenced in the preparation of this IS/MND. The 1988 Master Plan EIR will be available for review at the same locations as the Draft IS/MND noted above.

3.0 Project Description

3.1 Project Location and Site

The CSUSM campus is located in the City of San Marcos in northern San Diego County, California (Figure 1). Regional access to the CSUSM campus is provided from State Route 78 (SR-78), which is situated approximately one-half mile north of the campus. The campus is bounded by Twin Oaks Valley Road to the west, Barham Drive to the north, La Moree Road and residential development to the east, and mountainous terrain to the south (Figure 2).

The proposed CSUSM EL Building project site footprint is approximately 20,000 square feet, located in the southeastern portion of the CSUSM campus, east of Palm Canyon Drive, north of Parking Lots E and F, south of Parking Lot H (Figure 3). The building would be directly adjacent to the existing Foundation Classroom Building (FCB). The existing project site is undeveloped but has been previously graded (Figure 4).

3.2 Purpose and Need

The purpose of the proposed project is to construct a new EL Building to expand the EL Department, provide new instructional space for EL program courses, as well as co-locate other EL units. The proposed project would support the growing needs of the EL Department and bring the organizational units reporting to it together to develop a more cohesive department. In addition, the proposed project would alleviate state funded classroom and lab spaces that are currently impacted by use for EL courses. Therefore, in addition to allowing the expansion of the EL Department, the proposed project would improve the campus utilization of state funded spaces.

3.3 Proposed Project

The proposed project would design and construct a new EL Building within the existing CSUSM campus development footprint. The proposed project would have a footprint of approximately 20,000 square feet (SF), include approximately 52,300 SF of useable space, and be three-stories in height. The new structure is planned to include offices, meeting/conference rooms, classrooms and lecture halls, computer labs, science labs, research space, and lab storage rooms, as shown in Table 1. It is anticipated that approximately 63,300 SF would ultimately be required to support the expanded EL Department. Approximately 11,000 SF of these uses would be permanently located in the FCB. It is unknown at this time which uses would be located in the FCB. Therefore, Table 1 includes all planned uses that may be located in the new EL Building. No physical changes to FCB would be required to accommodate the EL Department uses. Only internal design changes would occur.

The proposed building's exterior design would be consistent with the existing materials, scale, and mass of surrounding campus buildings, including the adjacent FCB. The existing EL Department serves approximately 940 full-time equivalent students (FTES) and utilizes the existing EL Department adjacent to the project site. At opening day, scheduled for the spring of 2019, the EL Department would add an additional 715 FTES and expand enrollment to a total of 1,655 FTES.

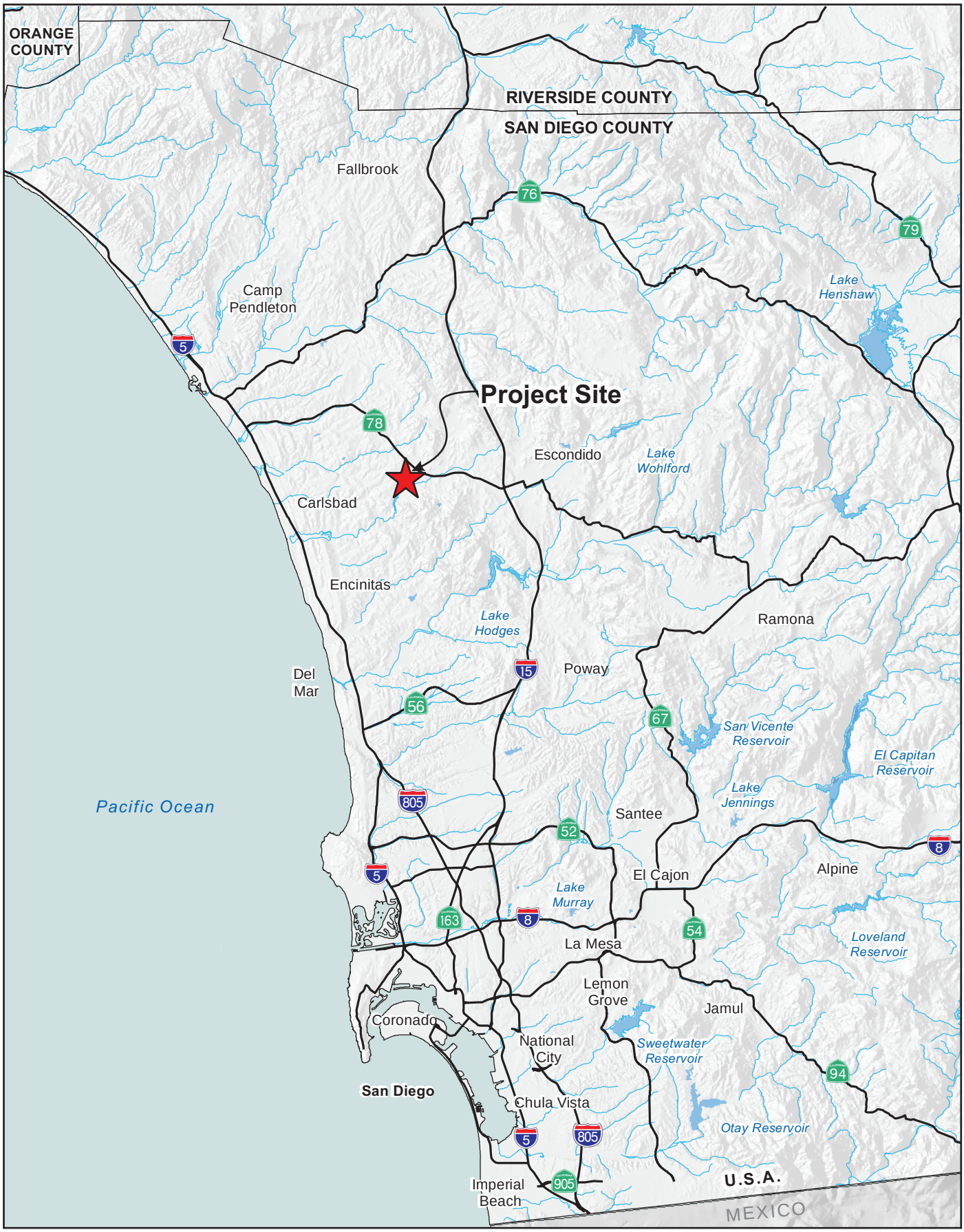
Table 1 Extended Learning Building Program Summary

Use	Current Space[1]		Future Space[2]	
	Number	ASF	Number	ASF
EL Dean and Finance Administration		**1,220**		
Offices	3	420		
Staff Stations	10	800		
EL Programming		**2,050**		
Staff Offices	4	440		
Staff Stations	16	1,280		
Meeting Rooms	3	330		
EL Student Services		**1.940**		
Staff Offices	3	330		
Staff Stations	16	1,280		
Meeting Rooms	3	330		
EL CRM and Marketing		**1,180**		
Staff Offices	2	220		
Staff Stations	12	960		
Instructional Space		**2,900**		**12,200**
Lecture Halls	3	2,900	6	6,720
Labs - Computer and Science			2	4,740
Faculty Office			4	440
Research Center and Lab Storage			2	300
American Language and Culture Institute		**3,364**		**7,873**
Offices	2	260	3	330
Stations	10	800	21	1,680
Lecture Halls	3	2,304	5	3,888
Lobby/Reception			1	100
Conference and Meeting Space			2	1,875
Global Programs and Services		**1,636**		**450**
Offices	4	480		
Staff Stations	2	160		
Lobby/Reception and Resource Area	1	996	1	150
Conference Room			1	300
Speech and Language Pathology		**620**		**820**
Faculty Offices	4	440	4	440
Staff Stations	1	80	1	80
Workroom and Conference Room	1	100	1	300
Masters in Social Work		**820**		**2,145**
Faculty Offices	6	660	12	1,320
Staff Stations	2	160	5	400
Conference Room			1	225
Simulation/Observation Room			2	200
Future Department				**1,945**
Faculty Offices			12	1,320
Staff Stations			5	400
Conference Room			1	225

ASF = Approximate Square Footage

[1] Current Space is the space needed to accommodate existing EL Department programs. Approximately 11,000 SF of these uses would be located in the FCB.

[2] Future space is the additional space required to allow the Extended Learning Program to grow.



Source: SanGIS, 2009; CASIL, 2009

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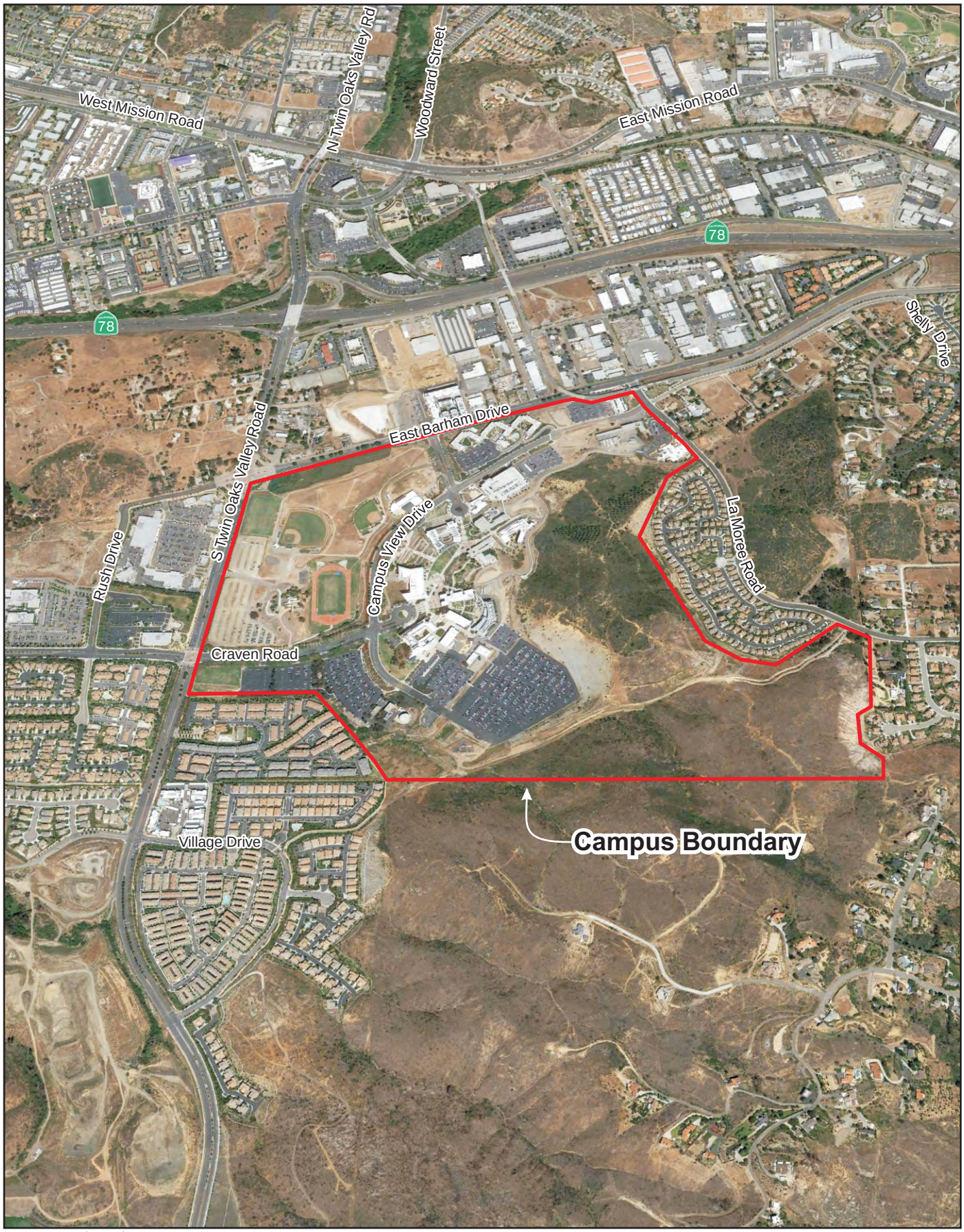
0 5 10
Miles

N

REGIONAL LOCATION
FIGURE 1



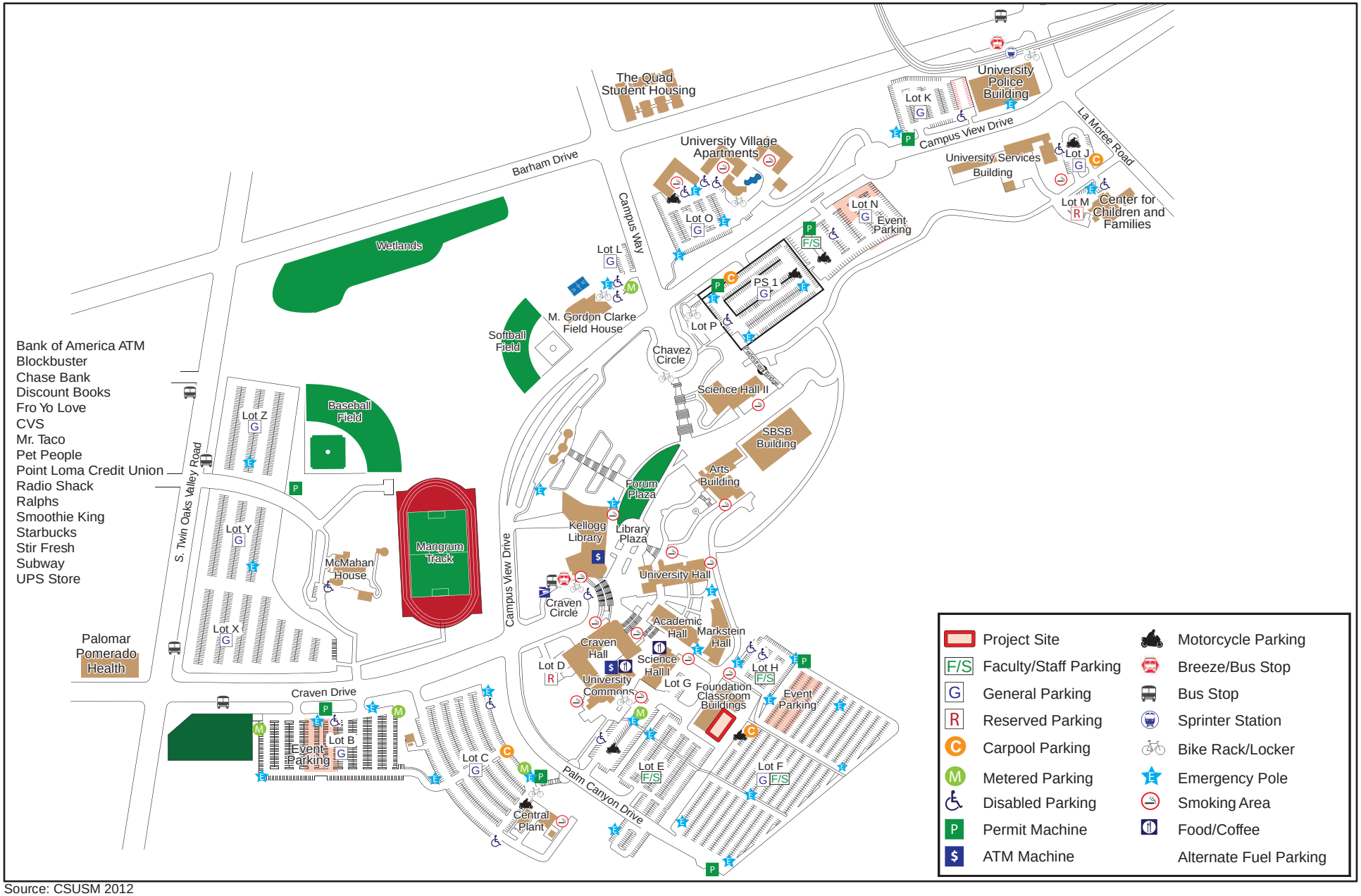
Source: Google Earth Pro 2015

ATKINS

0 500 1000
Feet

N

PROJECT VICINITY MAP
FIGURE 2



Source: CSUSM 2012

ATKINS

No Scale

N

CSUSM CAMPUS MAP
FIGURE 3

Source: Google Earth Pro 2015

ATKINS

0 75 150

Feet

N

PROPOSED PROJECT SITE
FIGURE 4

The EL Department is anticipated to serve up to approximately 1,655 FTES. This total FTE enrollment is included in the overall campus FTES enrollment growth projections and will not increase the master plan FTE cap of 25,000 at full build out (Table 2).

Table 2 Projected Enrolment

2015/2016 (Existing)	2016/2017	2017/2018	2018/2019 (Opening Day)
940	1,205	1,469	1,655

Source: CSUSM, 2015

Utilities

The project site is adjacent to the existing FCB and is currently served by water, sewer, storm drain, electricity, and communication infrastructure. The proposed project would possibly require the relocation of the existing water, sewer, storm drain, and gas lines under the proposed building pad. If relocation is required, these lines would be rerouted within new building footprint. In addition, the proposed building would include installation of a heating, ventilation, and air conditioning (HVAC) system all located within noise attenuating enclosures.

Circulation and Access

The main vehicular circulation for cars, buses, and service vehicles to the project site would be via Palm Canyon Drive, south of Craven Road. Parking Lots E, F, and H provide parking in the immediate vicinity of the proposed project.

Existing sidewalks provide pedestrian access from the FCB and Parking Lots E, F, and H. A bike rack and locker are currently available at the western end of Parking Lot E. In compliance with the Americans with Disabilities Act (ADA) of 1990, the proposed EL Building would be designed to be ADA-accessible.

3.4 Project Construction

Construction of the project would consist of site preparation and relocation of utilities, followed by construction of the proposed EL Building. The site was previously graded and any additional earthwork for the proposed project would be balanced on site. No excavated material would be transported off site.

Construction of the proposed project would take approximately 18 months and is anticipated to begin in the summer of 2017 and be completed in the spring 2019. Standard construction equipment would be required for project construction, including, but not limited to, backhoes, excavators, and loaders. It is anticipated that a daily average of 20 construction workers would be required on site. Access to the project site by construction equipment would be from Palm Canyon Drive, south of Craven Road. The construction staging area would be located within the surrounding parking lot. Construction hours would be limited to 7:00 a.m. to 4:00 p.m. Monday through Friday.

3.5 Discretionary Actions

The project is a "discretionary project," defined in Section 15357 of the CEQA Guidelines as "a project that requires the exercise of judgment or deliberation when the public agency or body decides to approve or disapprove a particular activity." The following discretionary action is associated with the project:

- CSU Board of Trustees – CSU Master Plan Revision, Project Approval (Schematic Plans), and others as may be necessary.

4.0 Findings

CSUSM finds that the proposed project would not have a significant adverse effect on the environment based on the Initial Study Checklist (Chapter 5.0) and the Discussion of Environmental Impacts (Chapter 6.0). Some potentially significant effects have been identified and mitigation measures have been incorporated into the project to ensure that these effects remain at less than significant levels, as summarized in the Mitigation Monitoring and Report Program (Chapter 7.0). Thus, an MND is proposed to satisfy the requirement of CEQA (PRC 2100 et. seq. 14 Cal Code Regs 1500 et. seq.). This conclusion is supported by the following:

No Significant Effect Finding

1. **Aesthetics:** The proposed project would not have a substantial adverse effect on a scenic vista or substantially degrade the existing visual character or quality of the CSUSM campus because the new EL Building would be a similar height or shorter than the majority of existing structures on campus. The new EL Building would be designed to be consistent with existing on campus uses and the applicable CSUSM design standards in addition to the incorporation of Mitigation Measure Aes-1. Therefore, impacts to aesthetics due to project implementation would be less than significant. See Section 6.1, Aesthetics, for additional information.
2. **Agriculture and Forestry Resources:** The CSUSM campus does not contain areas designated as Prime Farmland, Unique Farmland, or Farmland of Statewide Importance; land under a Williamson Act contract; or forest land or timberland. Therefore, no impacts to agriculture and forestry resources would occur due to project implementation. See Section 6.2, Agriculture and Forestry Resources, for additional information.
3. **Air Quality:** Emissions of criteria pollutants during construction and operation of the proposed project would be below the screening level significance thresholds. In addition, the proposed project would not expose sensitive receptors to substantial pollutant concentrations and would not create objectionable odors affecting a substantial number of people. Therefore, impacts to air quality due to project implementation would be less than significant. See Section 6.3, Air Quality, for additional information.
4. **Biological Resources:** The proposed project is located within a developed area of the CSUSM campus that is not contiguous with any natural habitat that supports sensitive species. The project site, which was previously graded and is currently undeveloped, does not contain any candidate, sensitive, or special status species; riparian habitat or other sensitive natural community; federally protected wetlands or potentially jurisdictional waters; resources that would contribute to the assembly or function of a wildlife corridor; or suitable habitat that would support a nursery site. No direct impacts would occur. Therefore, no significant impacts to biological resources would occur due to project implementation. See Section 6.4, Biological Resources, for additional information.
5. **Cultural Resources:** There are no previously recorded historical resources, archaeological resources, paleontological resources, or burial sites located on the project site. Therefore, no impacts to previously recorded cultural resources would occur due to project implementation. The project site is disturbed, as the site was previously graded. The site is underlain by previously graded and imported soil that was subject to cultural monitoring at the time the soil was used for site preparation. Therefore, the potential for unknown buried archaeological resources or human remains to occur is low. Therefore, impacts to unknown cultural resources due to project implementation would be less

than significant. Lastly, no requests for consultation under Assembly Bill (AB) 52 have been received to date. See Section 6.5, Cultural Resources, for additional information.

6. **Geology and Soils:** Due to the distance of the project site from the closest known active faults, implementation of appropriate engineering techniques, and adherence to applicable building codes, impacts associated with seismic hazards due to project implementation would be less than significant. Due to the geologic conditions found within the project site, impacts associated with liquefaction, landslides, and expansive soils would be less than significant. Implementation of best management practices (BMPs) would reduce project impacts associated with soil erosion or loss of topsoil to less than significant levels. Project implementation could result in a potentially significant impact due to groundwater. Mitigation has been identified that would reduce this impact to a less than significant level. See Section 6.6, Geology and Soils, for additional information.
7. **Greenhouse Gas Emissions:** Greenhouse gas (GHG) emissions generated during construction and operation of the proposed project would not exceed the identified significance thresholds. Therefore, impacts associated with GHG emissions due to project implementation would be less than significant. See Section 6.7, Greenhouse Gas Emissions, for additional information.
8. **Hazards and Hazardous Materials:** Due to compliance with applicable regulations for the handling of hazardous materials and spill cleanup procedures, impacts associated with hazardous materials due to project implementation would be less than significant. Project implementation could result in a potentially significant impact due to impairment of the delivery of emergency services. Mitigation has been identified that would reduce these impacts to a less than significant level. In addition, CSUSM would comply with applicable fire code regulations to minimize risks to people and structures in the event of a wildland fire. Therefore, impacts associated with fire hazards due to project implementation would be less than significant. See Section 6.8, Hazards and Hazardous Materials, for additional information.
9. **Hydrology and Water Quality:** Due to the implementation of BMPs impacts to water quality during construction would be less than significant. Project implementation could result in potentially significant impacts due to alterations to the existing drainage pattern of the project site. Mitigation has been identified that would reduce this impact to a less than significant level. In addition, the proposed project would not place housing or other structures within a 100-year flood hazard area or inundation area. Therefore, no impacts associated with flood hazards would occur due to project implementation. See Section 6.9, Hydrology and Water Quality, for additional information.
10. **Land Use and Planning:** The proposed project would not physically divide an established community. Furthermore, CSUSM is a part of the CSU system, an entity of the State of California, which is not subject to municipal plans, policies, and regulations, such as county and/or city general plans or local ordinances. Therefore, no impacts associated with land use and planning would occur due to project implementation. See Section 6.10, Land Use and Planning, for additional information.
11. **Mineral Resources:** The proposed project would not result in the loss of availability of mineral resources. Therefore, impacts to mineral resources due to project implementation would be less than significant. See Section 6.11, Mineral Resources, for additional information.
12. **Noise:** Project implementation could result in potentially significant impacts due to temporary increases in ambient noise levels during construction. Mitigation has been identified that would reduce this impact to a less than significant level. Construction-related vibration would not disrupt vibration-sensitive receptors. Operation of the proposed project would generate noise associated with normal building usage activities within an existing developed campus neighborhood and would

not cause a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project. Therefore, impacts associated with a permanent increase in ambient noise levels due to project implementation would be less than significant. See Section 6.12, Noise, for additional information.

13. **Population and Housing:** The purpose of the proposed project is to construct a new EL Building on the CSUSM campus that would be used by students, faculty, and staff for academic or related activities. In the near-term, the project would serve the existing campus by relocating existing projects. In the long-term (3-5 years), the proposed project would expand the EL Department and is anticipated to up to approximately 1,655 full-time equivalent students (FTES). The EL Building would not induce significant growth on campus or in the City of San Marcos. The proposed project would not displace any existing housing or people, necessitating the construction of replacement housing elsewhere. Therefore, impacts to population and housing would be less than significant due to project implementation. See Section 6.13, Population and Housing, for additional information.
14. **Public Services:** The proposed project would include the construction of one additional campus building within an existing developed campus and would not substantially increase the demand for fire or police protection services or expand their service areas. Therefore, impacts to fire and police services due to project implementation would be less than significant. In addition, the proposed project would not induce significant growth on campus or in the City of San Marcos. Therefore, impacts to schools, parks, or other public facilities would be less than significant due to project implementation. See Section 6.14, Public Services, for additional information.
15. **Recreation:** The proposed project would not induce significant growth on campus or in the City of San Marcos, and would not increase the demand or development of recreational facilities. Therefore, impacts to recreational facilities would be less than significant due to project implementation. See Section 6.15, Recreation, for additional information.
16. **Transportation and Traffic:** The proposed project would contribute additional vehicle trips to the local circulation system; however, operation would not exceed the established significance criteria for the existing plus project and near term plus project scenarios. Therefore, impacts to traffic due to project implementation would be less than significant. See Section 6.16, Transportation and Traffic, for additional information.
17. **Utilities and Service Systems:** The proposed project would include the relocation of water line and sewer line infrastructure to connect the new EL Building to the existing campus water distribution system and sanitary sewer system, respectively. In addition, the proposed project would possibly require the relocation of the storm drain system under the proposed building pad and rerouted within the new building footprint. The proposed project is anticipated to increase water demand but will still be supported by the Vallecitos Water District. Project generated solid waste can be supported by existing landfill capacities. The construction of utilities infrastructure could potentially cause significant environmental effects. Mitigation has been identified that would reduce these impacts to a less than significant level. See Section 6.17, Utilities and Service Systems, for additional information.
18. **Mandatory Findings of Significance:** The 1988 Master Plan EIR included a cumulative impacts analysis that documented the effects of the 1988 Master Plan in connection with other past, present, and probable future projects. The cumulative impacts analysis has been updated to reflect current cumulative project conditions. The proposed project would not result in a cumulatively considerable contribution to any significant cumulative impacts. See Section 6.18, Mandatory Findings of Significance, for additional information.

5.0 Environmental Initial Study Checklist

Project Title: California State University San Marcos Extended Learning Building

Lead Agency Name and Address:

California State University
401 Golden Shore
Long Beach, CA 90802

Lead Agency Contact Person and Phone Number:

Steve Ramirez, Interim Director
Phone: (760) 750-4659

Project Location:

CSUSM is located in the City of San Marcos in northern San Diego County, California. The project site is located in the southeastern portion of the CSUSM campus, east of Palm Canyon Drive, north of Parking Lots E and F, south of Parking Lot H

Project Sponsor's Name and Address:

California State University San Marcos
Planning, Design and Construction
333 South Twin Oaks Valley Road, Craven Hall 5111
San Marcos, CA 92096-0001

General Plan Designation:

Not Applicable – CSU system is exempt

Zoning:

Not Applicable – CSU system is exempt

Description of Project:

See Chapter 3.0, Project Description.

Surrounding Land Uses and Setting:

The project site is surrounded by other campus uses including the FCB to the immediate northwest and northeast, Parking Lot E to the southwest, and Parking Lot F to the southeast of the project site.

Required Approvals:

CSU Board of Trustees – CSU Master Plan Revision, Project Approval (Schematic Plans), and others as may be necessary.

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

☒ Aesthetics	☐ Agriculture & Forestry Resources	☐ Air Quality
☐ Biological Resources	☐ Cultural Resources	☒ Geology/Soils
☐ Greenhouse Gas Emissions	☒ Hazards & Hazardous Materials	☒ Hydrology/Water Quality
☐ Land Use/Planning	☐ Mineral Resources	☒ Noise
☐ Population/Housing	☐ Public Services	☐ Recreation
☒ Transportation/Traffic	☒ Utilities/Service Systems	
☒ Mandatory Findings of Significance		

Determination: On the basis of this initial evaluation:

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

☒ I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.

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

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

☐ I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.

Steve Ramirez

Steve Ramirez, Interim Director
Planning, Design & Construction
California State University San Marcos

3/30/2016
Date

Evaluation of Environmental Impacts:

1) A brief explanation is required for all answers except "No Impact" answers that are adequately supported by the information sources a lead agency cites in the parentheses following each question. A "No Impact" answer is adequately supported if the referenced information sources show that the impact simply does not apply to projects like the one involved (e.g., the project falls outside a fault rupture zone). A "No Impact" answer should be explained where it is based on project-specific 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, then the checklist answers must indicate whether the impact is Potentially Significant, Less Than Significant With Mitigation, or Less Than Significant. "Potentially Significant Impact" is appropriate if there is substantial evidence that an effect may be significant. If there are one or more "Potentially Significant Impact" entries when the 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," as described in (5) below, may be cross-referenced).
5) Earlier analyses may be used where, pursuant to tiering, an effect has been adequately analyzed in an earlier EIR or Negative Declaration. Section 15063(c)(3)(D). In this case, a brief discussion should identify the following:
    a) Earlier Analysis Used. Identify and state where these are available for review.
    b) Impacts Adequately Addressed. Identify which effects from the 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., campus master plans, 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 a less than significant level.

Environmental Issues: Refer to Chapter 6.0 for a brief explanation of the environmental impacts indicated below.

		Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
5.1	**Aesthetics**				
	Would the project:				
a)	Have a substantial adverse effect on a scenic vista?	☐	☐	☒	☐
b)	Substantially damage scenic resources including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	☐	☐	☐	☒
c)	Substantially degrade the existing visual character or quality of the site and its surroundings?	☐	☐	☒	☐
d)	Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	☐	☒	☐	☐
5.2	**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 Department 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?	☐	☐	☐	☒
b)	Conflict with existing zoning for agricultural use, or a Williamson Act contract?	☐	☐	☐	☒

		Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
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 4256), or timberland zoned Timberland Production (as defined by Government Code Section 51104(g))?	☐	☐	☐	☒
d)	Result in the loss of forest land or conversion of forest land to non-forest use?	☐	☐	☐	☒
e)	Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?	☐	☐	☐	☒

5.3 Air Quality

Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project:

a)	Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☒	☐
b)	Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	☐	☐	☒	☐
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)?	☐	☐	☒	☐
d)	Expose sensitive receptors to substantial pollutant concentrations?	☐	☐	☒	☐
e)	Create objectionable odors affecting a substantial number of people?	☐	☐	☒	☐

		Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
5.4	**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?	☐	☐	☐	☒
b)	Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or US Fish and Wildlife Service?	☐	☐	☐	☒
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?	☐	☐	☐	☒
d)	Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	☐	☐	☐	☒
e)	Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☐	☐	☒
f)	Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	☐	☐	☐	☒

		Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
5.5	**Cultural Resources**				
	Would the project:				
a)	Cause a substantial adverse change in the significance of a historical resource as defined in Section 15064.5?	☐	☐	☐	☒
b)	Cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5?	☐	☐	☒	☐
c)	Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☐	☐	☒
d)	Disturb any human remains, including those interred outside of formal cemeteries?	☐	☐	☒	☐
5.6	**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 on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	☐	☐	☒	☐
	ii) Strong seismic ground shaking?	☐	☐	☒	☐
	iii) Seismic-related ground failure, including liquefaction?	☐	☐	☒	☐
	iv) Landslides?	☐	☐	☒	☐
b)	Result in substantial soil erosion or the loss of topsoil?	☐	☐	☒	☐
c)	Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	☐	☒	☐	☐

		Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
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?	☐	☐	☒	☐
e)	Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?	☐	☐	☐	☒

5.7 Greenhouse Gas Emissions

Would the project:

a)	Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	☐	☐	☒	☐
b)	Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	☐	☐	☒	☐

5.8 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?	☐	☐	☒	☐
b)	Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	☐	☐	☒	☐
c)	Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☐	☐	☒
d)	Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	☐	☐	☒	☐

		Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
e)	For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☐	☒
f)	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?	☐	☐	☐	☒
g)	Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☒	☐	☐
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?	☐	☐	☒	☐

5.9 Hydrology and Water Quality

Would the project:

a)	Violate any water quality standards or waste discharge requirements?	☐	☐	☒	☐
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)?	☐	☐	☒	☐
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?	☐	☒	☐	☐
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?	☐	☒	☐	☐

		Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
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?	☐	☒	☐	☐
f)	Otherwise substantially degrade water quality?	☐	☐	☒	☐
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?	☐	☐	☐	☒
h)	Place within a 100-year flood hazard area structures which would impede or redirect flood flows?	☐	☐	☐	☒
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?	☐	☐	☐	☒
j)	Inundation by seiche, tsunami, or mudflow?	☐	☐	☒	☐

5.10 Land Use and Planning

Would the project:

a)	Physically divide an established community?	☐	☐	☐	☒
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?	☐	☐	☐	☒
c)	Conflict with any applicable habitat conservation plan or natural community conservation plan?	☐	☐	☐	☒

		Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
5.11	**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?	☐	☐	☐	☒
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?	☐	☐	☐	☒
5.12	**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?	☐	☒	☐	☐
b)	Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?	☐	☐	☒	☐
c)	A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	☒	☐
d)	A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☒	☐	☐
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?	☐	☐	☐	☒
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?	☐	☐	☐	☒

		Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact

5.13 Population and Housing

Would the project:

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

5.14 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?	☐	☐	☒	☐
	ii. Police protection?	☐	☐	☒	☐
	iii. Schools?	☐	☐	☒	☐
	iv. Parks?	☐	☐	☒	☐
	v. Other public facilities?	☐	☐	☒	☐

		Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
5.15	**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?	☐	☐	☐	☒
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?	☐	☐	☐	☒
5.16	**Transportation/Traffic**				
	Would the project:				
a)	Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?	☐	☐	☒	☐
b)	Conflict with an applicable congestion management program, including but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?	☐	☐	☒	☐
c)	Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that result in substantial safety risks?	☐	☐	☐	☒
d)	Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	☐	☐	☐	☒
e)	Result in inadequate emergency access?	☐	☒	☐	☐

		Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
f)	Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?	☐	☐	☒	☐

5.17 Utilities and Service Systems

Would the project:

a)	Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	☐	☐	☒	☐
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?	☐	☒	☐	☐
c)	Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☒	☐	☐
d)	Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?	☐	☐	☒	☐
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?	☐	☐	☒	☐
f)	Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	☐	☐	☒	☐
g)	Comply with federal, state, and local statutes and regulations related to solid waste?	☐	☐	☐	☒

5.18 Mandatory Findings of Significance

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

6.0 Discussion of Environmental Impacts

6.1 Aesthetics

Would the project:

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

Less Than Significant Impact

Scenic vistas in the City of San Marcos include views to and from undeveloped hillsides and prominent landforms, such as the San Marcos Mountains, Merriam Mountains, Mount Whitney, Cerro de La Posas, Double Peak, Owens Peak, and Franks Peak (City of San Marcos 2012). The proposed project consists of the construction of an approximately 52,300 SF, three-story building in the southeastern portion of the CSUSM campus. The new EL Building would be located in a developed area of the campus and would be a similar height to existing on campus structures, including Craven Hall and Science Hall I to the northwest and Academic Hall and Markstein Hall to the north. The proposed project would not result in the obstruction of views of scenic vistas on or off campus. Therefore, impacts to scenic vistas would be less than significant.

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

No Impact

Highways in the vicinity of the CSUSM campus include SR-78, located approximately one-half mile north of the campus, and Interstate 15 (I-15), which is located approximately four miles east of the campus. These facilities are not officially designated state scenic highways (California Department of Transportation [Caltrans] 2011). Furthermore, there are no unique trees or trees of significant stature, unique rock outcroppings, or historic buildings in the vicinity of SR-78 and/or I-15 that would be affected by the proposed project. Therefore, the proposed project would not substantially damage scenic resources within a state scenic highway. No impact would occur.

c) Substantially degrade the existing visual character or quality of the site and its surroundings?

Less Than Significant Impact

The proposed project consists of the construction of a new EL Building and associated utilities infrastructure at the site of existing undeveloped land that has been previously graded on the CSUSM campus. The project site is surrounded by campus buildings of similar size and associated collegiate uses. The new building would be designed to be consistent with existing surrounding uses, specifically the adjacent FCB, and the applicable CSUSM design standards. The construction of an additional planned campus building within an existing developed campus neighborhood would be consistent with the existing campus character and would not change the character or quality of views available from surrounding roadways or land uses on and off campus. Therefore, the proposed project would not degrade the existing visual character or quality of the site and impacts would be less than significant.

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

Less Than Significant Impact with Mitigation Incorporated

The proposed project would include daytime exterior lighting, and would incorporate sustainability design measures consistent with current CSUSM policies to reduce glare. It should be noted that there is substantial existing nighttime lighting on the CSUSM campus. Major campus roadways and walkways are well lit for the safety of students and faculty/staff members that may be driving or walking through the campus after dark. In addition, residential and commercial areas surrounding the campus to the west, north, and east also contribute to the existing ambient light in the campus vicinity. Thus, nighttime views from the campus are already limited due to existing urban light pollution. The proposed project would include nighttime exterior lighting, which would increase the overall ambient nighttime lighting on campus. New nighttime lighting would result in a potentially significant impact if it would create a nuisance by spilling over onto sensitive receptors or result in unnecessary illumination. Mitigation measure Aes-1 requires the incorporation of the design measures to ensure that the proposed project would not adversely affect day or nighttime views in the area. With incorporation of mitigation measure Aes-1, impacts associated with new sources of light or glare would be less than significant.

Aes-1 Prior to completion of working drawings, a lighting plan outlining design measures to minimize lighting impacts of the proposed project will be prepared, reviewed, and approved by CSUSM Planning, Design and Construction. Standards design measures will include shielding all direct lighting from residential areas, sensitive biological habitat, and other light sensitive receptors; directing lighting to the specific location intended for illumination, such as walkways; minimizing non-essential and stray light spillover; using low intensity lamps, except when high intensity illumination is required for safety purposes; and, as feasible, being consistent with the intent of Lighting Standards in Section 20.47.060 of the San Marcos Municipal Code to minimize light pollution impacts to Mount Palomar Observatory.

6.2 Agriculture and Forestry Resources

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?

No Impact

The CSUSM campus is designated as "Urban and Built-up Land" and "Other Land" on the San Diego County Important Farmland 2008 Map (California Department of Conservation 2010). These designations do not constitute Prime Farmland, Unique Farmland, or Farmland of Statewide Importance. Therefore, the proposed project would not convert farmland to non-agricultural uses. No impact would occur.

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

No Impact

CSUSM is a part of the CSU system, an entity of the State of California, which is not subject to municipal plans, policies, and regulations, such as county and/or city general plans or local ordinances. Thus, the CSUSM campus is exempt from local land use and zoning requirements. In addition, no portion of the CSUSM campus is under a Williamson Act contract as identified on the San Diego County Williamson Act

Lands 2012/2103 map (California Department of Conservation 2013) and no agricultural land exists on the project site or surrounding area. Therefore, the proposed project would not conflict with existing zoning or with a Williamson Act contract. No impact would occur.

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 4256), or timberland zoned Timberland Production (as defined by Government Code Section 51104(g))?

No Impact

The CSUSM campus is designated as "Urban" on the Fire and Resource Assessment Program (FRAP) State of California Land Cover map (California Department of Forestry and Fire Protection [Cal Fire] 2006), which identifies forest land and rangeland coverage in California. This designation does not constitute forest land or timberland. Therefore, the proposed project would not conflict with existing zoning, or cause rezoning of, forest land or timberland. No impact would occur.

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

No Impact

As discussed in Section 6.2(c) above, there are no areas designated as forest land on the CSUSM campus. Therefore, the proposed project would not result in the loss of forest land or conversion of forest land to non-forest use. No impact would occur.

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?

No Impact

As discussed in Sections 6.2(b) and (c) above, there are no areas designated as farmland or forest land on the CSUSM campus. Therefore, the proposed project would not result in conversion of farmland to non-agricultural use or conversion of forest land to non-forest use. No impact would occur.

6.3 Air Quality

An Air Quality and Greenhouse Gas Technical Report was prepared for the proposed project (Atkins 2016). This report is provided as Appendix A and is summarized in this section and in Section 6.7 below.

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

Less Than Significant Impact

The California State Implementation Plan (SIP) is the document that sets forth the State's strategies for attaining the National Ambient Air Quality Standards (NAAQS). The San Diego Air Pollution Control District (SDAPCD) is the agency responsible for preparing and implementing the portion of the California SIP applicable to the San Diego Air Basin (SDAB). Since the SDAB is designated as in basic non-attainment of the NAAQS and in non-attainment of the more stringent California State Ambient Air Quality Standards (AAQS) for ozone, the SDAPCD's Regional Air Quality Strategy (RAQS) outlines the plans and control measures designed to attain the AAQS for ozone. The California SIP and the SDAPCD RAQS were developed in conjunction with each other to reduce regional ozone emissions. The *Eight Hour Ozone Attainment Plan for San Diego County* was prepared by the SDAPCD in 2007, which identifies control measures to reduce emissions of ozone precursors (volatile organic compounds [VOCs] and nitrogen oxides [NOx]) and

complies with federal SIP requirements. In addition, the SDAB is currently designated as in nonattainment of respirable particulate matter (PM_{10}) and fine particulate matter ($PM_{2.5}$).

The SDAPCD relies on information from the California Air Resources Board (CARB) and San Diego Association of Governments (SANDAG), including projected growth in the County and mobile, area, and all other source emissions, in order to project future emissions and develop appropriate strategies for the reduction of source emissions through regulatory controls. The CARB mobile source emission projections and SANDAG growth projections are based on population and vehicle trends and land use plans developed by the cities and the County. As such, projects that propose development that is consistent with the growth anticipated by SANDAG would be consistent with the California SIP and the SDAPCD RAQS.

The proposed project would construct a new EL Building to expand the EL Department, provide new instructional space for EL program courses, as well as co-locate other EL units. In addition, the proposed project is consistent with the 1988 Master Plan for the CSUSM campus, which includes the provision of expanded EL Department facilities. Thus, the proposed project would be consistent with the California SIP and the SDAPCD RAQS because employment growth resulting from campus build-out of the 1988 Master Plan has been accounted for in SANDAG growth projections. Therefore, the proposed project would not conflict with or obstruct implementation of the applicable air quality plan. Impacts would be less than significant.

b) Violate any air quality standards or contribute substantially to an existing or projected air quality violation?

Less Than Significant Impact

The SDAPCD does not provide quantitative thresholds for determining the significance of construction or mobile source-related projects. However, the SDAPCD does specify Air Quality Impact Analysis (AQIA) trigger levels for new or modified stationary sources (SDAPCD Rules 20.2 and 20.3) If these incremental levels are exceeded, an AQIA must be performed. Although these trigger levels do not generally apply to general land development projects, for comparative purposes these levels may be used to evaluate the increased emissions from these projects. The screening level thresholds can be used to demonstrate that a project's total emissions would not result in a significant impact to regional air quality. Because the AQIA screening thresholds do not include VOCs, the screening level for VOCs used in this analysis are from the South Coast Air Quality Management District (SCAQMD), which generally has stricter emissions thresholds than SDAPCD. For $PM_{2.5}$, the EPA "Proposed Rule to Implement the Fine Particle National Ambient Air Quality Standards" published in 2005, which quantifies significant emissions as 10 tons per year, will be used as the screening level threshold. The trigger thresholds listed in Table 3 below are used in this analysis to determine whether the project has the potential to violate regional air quality standards.

Construction. Construction activities would result in temporary increases in air pollutant emissions. These emissions would be generated primarily from construction equipment exhaust, earth disturbance, construction worker vehicle trips, and heavy duty truck trips. Air pollutant and GHG emissions were estimated using the proposed project activity data and the emission factors included in the CalEEMod model (Version 2013.2.2), which takes into account the hours of operation, load factor and the emission factors for each piece of equipment. For detailed model assumptions and output, please see Appendix A.

CalEEMod defaults were assumed for construction vehicles, trips for material delivery, hours of operation for individual pieces of construction equipment, and construction equipment specifications.

Table 3 SDAPCD Air Pollutant Thresholds

Pollutant	Pounds Per Hour	Pounds Per Day	Tons Per Year
Carbon monoxide (CO)	100	550	100
Nitrogen Oxides (NO_x)	25	250	40
Respirable Particulate Matter (PM_{10})	--	100	15
Fine Particulate Matter ($PM_{2.5}$)	--	55(1)	10(1)
Oxides of Sulfur (SO_x)	25	250	40
Lead (Pb)	--	3.2	0.6
Volatile Organic Compounds (VOCs)	--	75(2)	13.7(2)

(1) EPA "Proposed Rule to Implement the Fine Particle National Ambient Air Quality Standards" published September 2005.

(2) Based on VOC threshold from SCAQMD.

Source: SDAPCD Rule 1501, 20.2 (d)(2), Table 20.2-1.

The criteria air pollutant emissions from construction of the project are summarized in Table 4. As shown in this table, construction emissions would not exceed the significance thresholds during any individual construction phase. All construction emissions are below the recommended federal and regional significance thresholds. As the pollutants generated by every construction phase of the proposed project are below the thresholds and pollutants disperse rapidly as distance increases, the proposed project will not make significant localized impacts during construction phases. Therefore, impacts to air quality due to construction emissions would be less than significant.

Table 4 Estimated Construction Maximum Air Pollutant Emissions

Phase	Maximum Daily Emissions (pounds/day)					
	VOC	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
Site Preparation	1	13	7	<1	1	1
Grading	1	11	9	<1	2	1
Building Construction	1	12	9	<1	1	1
Architectural Coating	28	2	2	<1	<1	<1
SDAPCD Threshold	**75**	**250**	**550**	**250**	**100**	**55**
Impact?	No	No	No	No	No	No

Source: CalEEMod Version 2013.2.2. See Attachment A for model output.

Operation. Once constructed, the proposed building would not include any stationary sources of criteria pollutants. However, the project would generate new vehicular trips to the new building. New vehicular trips would emit criteria pollutants. According to the traffic analysis for the project by Linscott, Law and Greenspan (2016) the project is calculated to generate 1,716 ADT and is expected to serve approximately 715 additional FTES for credited programs (Linscott, Law and Greenspan (LLG) Engineers 2016). The default CalEEMod trip length for university or college land use is assumed. Additionally, the project would result in emissions from area sources, including fuel combustion emissions from space and water heating; fuel combustion emissions from landscape maintenance equipment; and VOC emissions from periodic repainting of interior and exterior surfaces. Daily air pollutant emissions associated with operational area sources and vehicular sources were estimated using the CalEEMod model (Version 2013.2). For detailed model assumptions and output, refer to the Air Quality and Greenhouse Gas Emission Analysis (Atkins 2016) provided in Appendix A. Maximum daily operational criteria pollutant emissions are summarized in

Table 5. As shown in this table, operational emissions would be below the significance thresholds and impacts to air quality due to operational emissions would be less than significant.

Table 5 Estimated Operational Maximum Air Pollutant Emissions

Sector	Maximum Daily Emissions (pounds/day)					
	VOC	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
Area Sources (Consumer products, architectural coating, and landscape equipment)	1	<1	<1	0	<1	<1
Energy Use	<1	<1	<1	<1	<1	<1
On-road Vehicles	5	11	50	<1	9	3
Total	***7***	***11***	***51***	***<1***	***9***	***3***
SDAPCD Threshold	**75**	**250**	**550**	**250**	**100**	**55**
Impact?	No	No	No	No	No	No

Source: CalEEMod Version 2013.2.2. See Appendix A for model output.

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)?

Less Than Significant Impact

The geographic context for the analysis of cumulative impacts relative to criteria air pollutants is the SDAB. San Diego County is presently designated as being a non-attainment area for the federal ozone standard; specifically, San Diego County is classified as a marginal nonattainment area for the federal 2008 8-hr ozone standard. The County is also a non-attainment area for the CAAQS for ozone, $PM_{10,}$ and $PM_{2.5}$. Consequently, the pollutants of concern are PM_{10}, $PM_{2.5}$, and ozone precursors (VOC and NO_X). If a project exceeds the regional thresholds for PM_{10}, or $PM_{2.5}$, then it would contribute to a cumulatively considerable impact for those pollutants. If a project exceeds the regional threshold for VOC and NO_X, then it follows that the project would contribute to a cumulatively considerable impact for ozone.

As shown in Table 4, the project's construction-generated emissions would not exceed the applicable SDAPCD's regional thresholds of significance. As shown in Table 5, the project's operational emissions would not exceed the SDAPCD's regional thresholds of significance. Therefore, project construction and operation would not result in a significant cumulative criteria pollutant impact.

Additionally, it is assumed that a project that conforms to the applicable planning document for the lead agency and does not have emissions exceeding the significance thresholds would not result in a cumulatively considerable net increase to ozone. It is assumed that SDAPCD's Regional Attainment Strategy accounts for growth identified in planning documents that were adopted prior to development of the Regional Attainment Strategy. In other words, it is reasonable to conclude that if a project is consistent with the applicable general plan land use designation (or similar planning document), and if the general plan (or other plan) was adopted prior to the Regional Attainment Strategy, then the growth generated by the project would be consistent with the growth assumed within the Regional Attainment Strategy. The proposed project is consistent with the 1988 Master Plan for the CSUSM campus. The most recent Regional Attainment Strategy is the 2009 Regional Attainment Strategy Revision. Therefore, the project's emissions were accounted for in the SDACPD's Regional Air Quality Strategy. There is no applicable air quality plan for particulate matter; however, as shown in Table 5, the project would not exceed any significance threshold for any criteria pollutant during operation. Maximum daily emissions

would be less than 10 percent of the significance thresholds for particulate matter. Therefore, the proposed project would not result in a significant cumulative impact for criteria pollutants during operation.

d) Expose sensitive receptors to substantial pollutant concentrations?

Less Than Significant Impact

Air quality regulators typically define sensitive receptors as schools (preschool – 12th grade), hospitals, resident care facilities, day-care centers, or other facilities that may house individuals with health conditions that would be adversely affected by changes in air quality. The two primary emissions of concern regarding health effects for development projects are CO and diesel particulate matter (DPM).

CO Hot Spots. Areas with high vehicle density, such as congested intersections and parking garages, have the potential to create high concentrations of CO, known as CO hot spots. An air quality pollutant concentration impact is considered significant if CO emissions create a hot spot where either the state one-hour standard of 20 parts per million (ppm) or the federal/state eight-hour standard of 9.0 ppm are exceeded. This typically occurs at severely congested intersections (level of service [LOS] E or worse). As discussed in Section 6.3(b) above, the proposed project would generate 1,028 ADT. As discussed in Section 6.16(a), the proposed project would not cause any intersection to operate at an LOS E. Three intersections would operate at a LOS F in Year 2020 without implementation of the proposed project; however, the proposed project would not result in significant additional congestion at either intersection. Therefore, the proposed project would not result in increased exposure to any CO hot spot.

Diesel Particulate Matter. According to the San Diego County Guidelines for Determining Significance – Air Quality (County of San Diego 2007), DPM is the primary toxic air contaminant (TAC) of concern for typical land use projects that do not propose stationary sources of emissions regulated by the SDAPCD. Since the proposed project includes athletic and spectator uses that typically do not include stationary sources of emissions regulated by the SDAPCD, the primary sources of DPM would be the equipment operated during construction. As shown in Table 4 above, construction of the project would not result in PM emissions above the screening level threshold. In addition, because DPM is considered to have long-term health effects and construction would be a short-term event, emissions would not result in a significant long-term health risk to surrounding receptors.

Based on siting recommendations within the CARB's Air Quality and Land Use Handbook (CARB 2005), a detailed health risk assessment should be conducted for proposed sensitive receptors within 1,000 feet of a warehouse distribution center, within 300 feet of a large gas station, within 50 feet of a typical gas dispensing facility, or within 300 feet of a dry cleaning facility that uses perchloroethlyene (PCE), among other siting recommendations. In addition, the CARB recommends that a health risk assessment be prepared for any sensitive receptors proposed within 500 feet of a highway. However, the proposed project is not considered to be a sensitive receptor. In addition, there are no facilities in the vicinity of the project site that would emit toxic contaminants and the project site is more than 500 feet from a highway. Furthermore, the proposed project itself would not emit toxic air contaminants. Therefore, impacts to sensitive receptors would be less than significant.

e) Create objectionable odors affecting a substantial number of people?

Less Than Significant Impact

Construction of the proposed project could result in minor amounts of odor compounds associated with diesel heavy equipment exhaust. Potential receptors would include students and faculty/staff on campus.

However, pedestrians passing the site would be exposed to odors only briefly. Furthermore, all diesel equipment would not be operating simultaneously and construction activities would be temporary. Therefore, construction-related impacts associated with objectionable odors would be less than significant.

The CARB's Air Quality and Land Use Handbook (CARB 2005) includes a list of the most common sources of odor complaints received by local air districts. Typical sources of odor complaints include facilities such as sewage treatment plants, landfills, recycling facilities, petroleum refineries, and livestock operations. Operation of the proposed project would not involve activities that are typical sources of odor complaints. Therefore, operational impacts associated with objectionable odors would be less than significant.

6.4 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?

No Impact

The proposed project is surrounded by the developed CSUSM campus, including the FCB to the immediate northwest and northeast, Parking Lot E to the southwest, and Parking Lot F to the southeast. The project site, which was previously graded and is currently undeveloped, does not contain any candidate, sensitive, or special status plant or wildlife species or habitat. Therefore, the proposed project would not have a substantial adverse effect on any species identified as a candidate, sensitive, or special status species. No impact would occur.

b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or US Fish and Wildlife Service?

No Impact

The proposed project is located within a developed area of the CSUSM campus that is not contiguous with any sensitive habitat. The project site, which was previously graded and is currently undeveloped, does not contain any riparian habitat or other sensitive natural community. Therefore, the proposed project would not have a substantial adverse effect on any riparian habitat or other sensitive natural community. No impact would occur.

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?

No Impact

The proposed project site is located over 2,200 feet southeast from an area of emergent wetland habitat. The project site, which was previously graded and is currently undeveloped, does not contain any wetland habitat. Based on the relative distance and lack of wetlands on the project site, the proposed project would not have a substantial adverse effect on federally protected wetlands through direct removal, filling, hydrological interruption, or other means. No impact would occur.

d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?

No Impact

The proposed project is located within a developed area of the CSUSM campus. The project site, which was previously graded, does not contain any resources that would contribute to the assembly or function of a wildlife corridor and does not contain suitable habitat that would support a nursery site, such as trees. Therefore, the proposed project would not interfere substantially with the movement of any wildlife species or with established native resident migratory wildlife corridors, or impede the use of native wildlife nursery sites. No impact would occur.

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

No Impact

CSUSM is a part of the CSU system, an entity of the State of California, which is not subject to municipal plans, policies, and regulations, such as county and/or city general plans or local ordinances. However, the CSUSM campus does have a tree preservation policy. The purpose of the tree preservation policy is to protect existing trees against unnecessary cutting, breaking or skinning of roots, skinning or bruising of bark, smothering of trees by stockpiling construction materials or excavation materials within the drip line, excess foot or vehicle traffic, or parking vehicles within drip line. Two small non-native trees are located on the project site that would require removal and would not be subject to protection under the CSUSM tree preservation policy. No impact would occur.

f) Conflict with any applicable habitat conservation plan or natural community conservation plan?

No Impact

As discussed in Section 6.4(e) above, as a state entity, CSUSM is not subject to municipal plans, policies, and regulations. Although the CSUSM campus is located within the boundaries of the North County Multiple Habitat Conservation Program (MHCP) Plan and the Draft City of San Marcos Subarea Plan, the campus is not covered by these plans. Therefore, the proposed project would not conflict with any applicable habitat conservation plan or natural community conservation plan. No impact would occur.

6.5 Cultural Resources

Would the project:

a) Cause a substantial adverse change in the significance of a historical resource as defined in Section 15064.5?

No Impact

Based on a cultural resources records search and field investigation conducted for the CSUSM campus by ASM Affiliates, Inc. (January 2010), there are no existing significant historical resources on the campus. Therefore, the proposed project would not cause a substantial adverse change in the significance of a historical resource. No impact would occur.

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

Less Than Significant Impact

Based on a cultural resources records search and field investigation conducted for the CSUSM campus by ASM Affiliates (January 2010), there are no known existing significant archaeological resources on the campus and no previously recorded resources on the project site. Furthermore, the site has been subject to ground disturbance. Therefore, the potential for unknown buried archaeological resources to occur is low. Impacts to archaeological resources would be less than significant.

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

No Impact

According to the 1988 Master Plan EIR, a paleontological resources survey conducted by RMW Paleo Associates in 1987 determined that the CSUSM campus is underlain by sedimentary and igneous rocks (LSA Associates 1988). The sedimentary rocks are alluvial deposits that date less than 10,000 years old and are too young geologically to contain fossils. The igneous rocks or granitic rocks are much older, approximately 100 million years old; however, these rocks do not contain fossils because they were formed as molten rocks that were cooled deep within the earth. Because these geological formations do not contain fossils, no paleontological resources have been identified on campus. Therefore, the proposed project would not directly or indirectly destroy a unique paleontological resource or site or unique geologic feature. No impact would occur.

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

Less Than Significant Impact

No known burial sites have been identified on the CSUSM campus. Furthermore, the site has been subject to ground disturbance. The site was previously graded and is currently undeveloped. Therefore, the potential for unknown buried human remains to occur is low. Although unlikely, the discovery of unknown buried human remains during project construction is always a possibility. If human remains are encountered during construction, the find would be handled in accordance with California Health and Safety Code Section 7050.5, which states that no further disturbance shall occur until the County Coroner has made a determination of origin and disposition pursuant to California Public Resources Code Section 5097.98. The County Coroner must be notified of the find immediately. If the human remains are determined to be prehistoric, the Coroner will notify the Native American Heritage Commission (NAHC), which will determine and notify a Most Likely Descendent (MLD). The MLD shall complete the inspection of the site within 24 hours of notification, and may recommend scientific removal and nondestructive analysis of human remains and items associated with Native American burials. Compliance with California Health and Safety Code Section 7050.5 would prevent potentially significant impacts in the unlikely event that human remains are encountered during construction. Therefore, impacts associated with the disturbance of human remains would be less than significant.

6.6 Geology and Soils

Would the project:

a) Expose people or structures to potential substantial adverse effects, including the risk of loss, or injury, or death involving:

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

Less Than Significant Impact

According to the San Marcos General Plan Safety Element, the project site is not located on any known active, potentially active, or inactive fault traces as defined by the California Geological Survey (CGS 2010). Furthermore, the project site is not located within an Alquist-Priolo Earthquake Fault Zone (California Department of Conservation 2013). The closest known active faults are the Newport-Inglewood Fault and the Rose Canyon Fault, both located offshore approximately 12 miles west of the project site. Due to the distance of the project site from the closest known active faults, the potential for the proposed project to expose people or structures to substantial adverse effects from fault rupture is low. Therefore, impacts associated with rupture of a known fault would be less than significant.

ii) Strong seismic ground shaking?

Less Than Significant Impact

According to the 2012 Geocon Incorporated geotechnical investigation prepared for the CSUSM Student Health and Counseling Services Building (SHCSB), nine active faults are located within a 50-mile radius of the project site. Since the project site is located approximately 1,425 feet south from the SHCSB building, the proposed project would experience a similar intensity of seismic ground shaking. Earthquakes occurring on these faults would potentially generate strong seismic ground shaking at the project site. Table 6 lists the estimated maximum earthquake magnitude and the calculated peak ground acceleration at the project site for these regional active faults. As shown in Table 6, the Newport-Inglewood Fault represents the most dominant source of potential ground motion (acceleration) at the project site.

Table 6 Peak Ground Accelerations at Project Site from Regional Active Faults

Fault Name	Distance from Project Site (miles)	Maximum Earthquake Magnitude (M_w)	Peak Ground Acceleration (g)[1,2]		
			Boore-Atkinson 2008	Campbell-Bozorgnia 2008	Chiou-Youngs 2008
Newport-Inglewood	12	7.5	0.17	0.15	0.18
Rose Canyon	12	6.9	0.14	0.13	0.13
Elsinore	17	7.85	0.17	0.13	0.16
Coronado Bank	28	7.4	0.10	0.07	0.08
Palos Verdes Connected	28	7.7	0.11	0.08	0.10
Earthquake Valley	33	6.8	0.06	0.05	0.04
San Jacinto	42	7.88	0.08	0.06	0.08
San Joaquin Hills	44	7.1	0.06	0.06	0.05
Palos Verdes	45	7.3	0.06	0.05	0.04

(1) Peak ground acceleration was calculated using three models based on different acceleration-attenuation relationships.
(2) Ground acceleration is expressed in units of acceleration due to gravity (g).
Source: Geocon 2012

Pursuant to the Uniform Building Code (UBC) and the California Building Code (CBC), design and construction of the proposed project would be engineered to withstand the expected ground acceleration that may occur at the project site from regional active faults. Proper engineering and adherence to the UBC and CBC guidelines would minimize the risk to life and property from potential ground motion at the project site. Therefore, impacts associated with strong seismic ground shaking would be less than significant.

iii) Seismic-related ground failure, including liquefaction?

Less Than Significant Impact

Liquefaction is a phenomenon where loose, saturated, and relatively cohesionless soil deposits lose strength during strong ground motions. Primary factors controlling the development of liquefaction include intensity and duration of ground accelerations, characteristics of the subsurface soil, in situ stress conditions, and depth to groundwater. According to the San Marcos General Plan Safety Element, due to the dense nature of the granitic rock underlying the project site, the potential for liquefaction is considered very low. Therefore, impacts associated with seismic-related ground failure, including liquefaction, would be less than significant.

iv) Landslides?

Less Than Significant Impact

According to the 2012 San Marcos General Plan Safety Element, there is very low probability of landslides occurring on the project site. According to the field investigation conducted by Geocon (2012) for the CSUSM SHCSB site, located approximately 1,425 feet north from the project site, no landslides were encountered during previous or current SHCSB site investigations or grading activities and no landslides are known to exist on the SHCSB project site. The potential for landslides on the EL Building project site would be similar to the CSUSM SHCSB project site because they are not directly adjacent to any steep slopes. Therefore, impacts associated with landslides would be less than significant.

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

Less Than Significant Impact

The proposed project would involve site grading and excavations, which would result in disturbed soils and temporary stockpiles of excavated materials that would be exposed to erosion. However, voluntary compliance with the NPDES Construction General Permit, which requires the development of a Storm Water Pollution Prevention Plan (SWPPP), would minimize the potential for soil erosion and loss of top soil through the implementation of BMPs, such as the following:

- **Minimizing Disturbed Areas.** Clearing of land is limited to that which will be actively under construction in the near term, new land disturbance during the rainy season is minimized, and disturbance to sensitive areas or areas that would not be affected by construction is minimized.
- **Stabilizing Disturbed Areas.** Temporary stabilization of disturbed soils is provided whenever active construction is not occurring on a portion of the project site, and permanent stabilization is provided by finish grading and permanent landscaping.
- **Protecting Slopes and Channels.** Outside of the approved grading plan area, disturbance of natural channels is avoided, slopes and crossings are stabilized, and increases in runoff velocity caused by the project are managed to avoid erosion to slopes and channels.

- **Controlling the Site Perimeter**. Upstream runoff is diverted around or safely conveyed through the project site and is kept free of excessive sediment and other constituents.
- **Controlling Internal Erosion.** Sediment-laden waters from disturbed, active areas within the project site are detained.

Once construction is completed, any remaining disturbed soils would be stabilized with xeriscape landscaping techniques and no stockpiles would remain on the project site. Therefore, impacts associated with soil erosion and loss of topsoil would be less than significant.

c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse?

Less Than Significant Impact With Mitigation Incorporated

The project site was previously graded and is currently undeveloped. According to the San Marcos General Plan, CSUSM is underlain by hard granitic bedrock at the project site, which is considered suitable in their present condition for support of structures. Additionally, according to the San Marcos General Plan, the CSUSM campus is located upon soils that have low susceptibility of becoming unstable. Thus, the proposed project would not be located on a geologic unit or soil that is unstable. However, the proposed project would involve site grading, which would require backfill with on-site fill materials. Improperly backfilled excavations could potentially result in unstable soil conditions. However, backfill would be required to adhere to all applicable UBC and CBC guidelines, including guidelines for proper placement and compaction of backfill, which would minimize the risk of unstable soil conditions.

Soil stability can also be affected by near-surface groundwater. According to the geotechnical investigation prepared for the CSUSM SHCSB, a static, near-surface groundwater table and groundwater seepage were not observed during the field exploration within the CSUSM SHCSB project site (Geocon 2012), which is approximately 1,425 feet north to the project site. However, frequent occurrences of groundwater seepage, which are typically transmitted along fractures within the underlying granitic bedrock and associated with irrigation runoff and/or storm water at higher elevations, have been previously encountered throughout the development history of the CSUSM campus (Geocon 2012). As such, there is the potential that groundwater seepage conditions may develop within the project site. Saturated soils resulting from groundwater seepage could potentially become unstable. This represents a potentially significant impact; however, implementation of mitigation measure Geo-1 (detailed below) would reduce this impact to a less than significant level.

Geo-1 For any excavations within the project site where groundwater seepage has the potential to occur, shallow subdrains shall be installed in these locations to collect and convey the water to a suitable outlet. Subdrains shall be designed similar to previous subdrain designs on the CSUSM campus, and shall be installed either prior to or during construction of the proposed project.

d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1997), creating substantial risks to life or property?

Less Than Significant Impact

According to the San Marcos General Plan Safety Element, expansive soils in San Marcos are located within soils, alluvium, and bedrock formations that contain clay minerals, which is most commonly found in the Santiago Formation in the hillside areas and the upper reaches of canyons where colluviums are present

(San Marcos General Plan Safety Element 2012). Since the CSUSM campus is not located in these areas with high potential for expansive soils and the project site is underlain with granitic bedrock, the impacts from expansive soils would be less than significant.

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

No Impact

The CSUSM campus is provided with sanitary sewer service by the Vallecitos Water District (VWD). The proposed project would connect to the existing sanitary sewer system within the CSUSM campus and would not include the use of septic tanks or alternative waste disposal systems. No impact would occur.

6.7 Greenhouse Gas Emissions

An Air Quality and Greenhouse Gas Emissions Analysis was prepared for the proposed project by Atkins (2016). This report is provided as Appendix A and is summarized in this section and in Section 6.3 above.

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

Less Than Significant Impact

California Health and Safety Code Section 38505(g) defines GHGs to include the following compounds: carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), chlorofluorocarbons (CFCs), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6). The most common GHGs related to human activity are CO_2 (CO_2e = 1), CH_4 (CO_2e = 21), and N_2O (CO_2e = 310). As individual GHGs have varying heat-trapping properties and atmospheric lifetimes, GHG emissions are converted to carbon dioxide equivalent (CO_2e) units for comparison. Using CO_2e units is a consistent methodology for comparing GHG emissions because it normalizes various GHG emissions to a directly comparable measure. For instance, CH_4 is a GHG that is 21 times more potent than CO_2; therefore, one metric ton of CH_4 is equal to 21 metric tons (MT) CO_2e.

In 2006, the Global Warming Solutions Act (AB 32) established statutory limits on GHG emissions in California. Under AB 32, CARB has the primary responsibility for reducing GHG emissions. CARB works with the CCAT to coordinate statewide efforts and promote strategies that can be undertaken by many other California agencies. In addition, AB 32 requires the CARB to adopt rules and regulations that would achieve GHG emissions equivalents to statewide levels in 1990 by 2020.

In the absence of adopted state, CSU, or SDAPCD thresholds, the threshold of significance adopted by the County of San Diego in June 2012 was utilized to determine whether the GHG emissions from the proposed project may have a significant impact on the environment. The County of San Diego's Draft Guidelines for Determining Significance for Climate Change (County of San Diego 2012) are based on regional data and may be used by other lead agencies in the region. The purpose of the County's guidelines is to ensure that new development achieves its fair share of emissions reductions needed to meet the statewide AB 32 mandate. The County's guidelines establish a screening level threshold of 2,500 MT CO_2e. Projects that would emit less than 2,500 MT CO_2e are considered to have insignificant emissions and would not affect the region's ability to meet reduction goals. This screening level applies separately to both construction and operation. Therefore, projects that result in emissions that are below this screening level threshold would not result in significant GHG emissions and no further analysis is required.

Construction. Construction of the proposed project would generate GHG emissions from construction equipment, earth disturbances, construction worker vehicle trips, and heavy duty truck trips. GHG emissions were estimated using the worst-case activity data and the emission factors included in the CalEEMod model (Version 2013.2.1), which takes into account the hours of operation, load factor, and the emission factor for each piece of equipment. Worst-case annual construction-related GHG emissions associated with the proposed project are summarized in Table 7. For detailed model assumptions and outputs refer to the Air Quality and Greenhouse Gas Emission Analysis found in Appendix A. CalEEMod defaults were assumed for construction vehicle trips for material delivery, hours of operation for construction equipment, and construction equipment specifications. As shown in Table 7, construction-related GHG emissions would result in total GHG emissions of 231 MT CO_2e over 18 months. Annual GHG emissions would not exceed the 2,500 MT CO_2e threshold during construction. Therefore, a significant GHG emissions impact would not occur during construction of the proposed project. Thus, impacts due to construction-related GHG emissions would be less than significant.

Table 7 Estimated Construction-Related GHG Emissions

Construction Phase	GHG Emissions (MT CO_2e)
Site Preparation	20
Grading	25
Building Construction	180
Architectural Coating	6
Total	**231**
County GHG Threshold	**2,500**
Impact?	No

Source: CalEEMod Version 2013.2.1. See Appendix A for model output.

Operation. As discussed in Section 6.3 above, the proposed project would generate new vehicular trips for sport games and other events. The traffic impact analysis prepared for the project by Linscott, Law and Greenspan Engineers (2013) determined that proposed project would generate 1,028 ADT and is expected to serve approximately 715 additional Full Time Equivalent students for credited programs. The default CalEEMod trip length for university or college land use is assumed.

Additionally, the project would result in an increase in solid waste generation and increase the campus water and energy demand. The project's increase in solid waste, water, and energy demand is estimated using CalEEMod defaults for a university or college land use. The analysis assumes implementation of standard campus sustainability practices, including exceeding Title 24 energy standards by 26 percent, use of water efficient landscape irrigation and appliances, mandatory water use reductions (30 percent), and diversion of 75 percent of waste from landfills. CalEEMod estimates that the proposed project would result in an annual demand for 1,539,680 kBTU of natural gas, 476,714 kWh of electricity, 0.6 million gallons of potable water, and 20 tons of solid waste disposal.

Table 8 summarizes annual GHG emissions from operation of the new extended learning building. On-road vehicles make up the largest percentage of total GHG emissions (87 percent), followed by electricity (8 percent), natural gas (4 percent), solid waste and water use (less than 1 percent each). Landscaping contributes a negligible amount of GHG emissions. Annual GHG emissions would not exceed the 2,500 MT CO_2e threshold during operation. Therefore, a significant GHG emissions impact would not occur.

Table 8 Estimated Operational GHG Emissions

Sector	GHG Emissions (MT CO_2e)	Percent of Total GHG Emissions
On-road Vehicles	1,711	87
Electricity	156	8
Natural Gas	83	4
Solid Waste	9	<1
Water Use	7	<1
Landscaping	<1	<1
Total	**1,966**	**100**
County GHG Threshold	**2,500**	**--**
Impact?	No	--

Source: CalEEMod Version 2013.2.1. See Attachment A for model output.

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

Less Than Significant Impact

Refer to discussion in Section 6.7(a) above.

6.8 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?

Less Than Significant Impact

Construction of the proposed project would involve the transport of gasoline and other fuels associated with construction equipment. Operation of the proposed project would involve the use of household/industrial cleaning products, and air conditioning and heating unit chemicals. Mishandling of hazardous materials, such as improper storage or disposal, could potentially expose the public or the environment to hazardous materials. However, compliance with applicable California Department of Toxic Substances Control (DTSC) regulations for the handling of hazardous materials and spill cleanup procedures, such as the Resource Conservation and Recovery Act (RCRA) would prevent a significant hazard to the public and the environment. RCRA regulates hazardous material from "cradle to grave," where hazardous materials are tracked from point of generation until it is recycled, reused, or disposed. DTSC is responsible for implementing the RCRA program as well as California's own hazardous waste laws, which are collectively known as the Hazardous Waste Control Law. In addition, the new EL Building would adhere to current CSUSM policies and procedures for hazardous materials, such as appropriate staff training and proper labeling/storage of chemicals, further minimizing risks associated with the handling of hazardous materials. Therefore, impacts associated with the routine transport, use, or disposal of hazardous materials would be less than significant.

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

Less Than Significant Impact

Accidental leaks or spills of hazardous materials may occur during construction or operation of the proposed project, which could potentially expose the public or the environment to hazardous materials. However, compliance with applicable DTSC regulations for the handling of hazardous materials and spill cleanup procedures would prevent significant hazards to the public and the environment. In addition, pursuant to the California Hazardous Materials Release Response Plan and Inventory Law, CSUSM has prepared a Hazardous Materials Business Plan (HMBP), which addresses emergency and spill response procedures including, but not limited to, specific emergency response instructions, locations of personnel and equipment resources (i.e., telephone numbers, fire extinguishers, spill kits, safety showers/ eyewashes, first aid kits, etc.), and specialty hazard instructions. As a new CSUSM facility, the HMBP would be updated to include the proposed EL Building, further minimizing risks associated with the accidental release of hazardous materials. Therefore, impacts associated with reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment would be less than significant.

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

No Impact

There are no primary or secondary schools currently located or proposed to be built within one-quarter mile of the CSUSM campus. The closest school is San Marcos Elementary School, located approximately 1.3 miles northwest of the campus. Therefore, the proposed project would not emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school. No impact would occur.

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 create a significant hazard to the public or the environment?

Less Than Significant Impact with Mitigation Incorporated

The CSUSM campus is not listed as a hazardous materials site pursuant to Government Code Section 65962.5. However, according to the 1988 Master Plan EIR, the CSUSM campus previously supported a large poultry operation and agricultural uses, which may have involved in the use of organophosphorus and organochlorine pesticides. A Geotechnical investigation conducted for the University Student Union site (Geocon Incorporated 2010), north of the project site and in an area located in direct vicinity of historical poultry operations, included a limited environmental testing program to evaluate the potential presence and concentration of organophosphorus and organochlorine pesticides. Concentrations of organophosphorus and organochlorine pesticides were only detected at two of the test locations. The detected concentrations at these two test locations were well below regulatory thresholds that are protective of human health and safety, and below USEPA preliminary remediation goals for residential end land use. Furthermore, the location of the proposed project site is not in a location on campus with historical poultry operational uses, and soils on the project site consist of compacted fill. Due to the results of testing at the University Student Union site, the location of the project area in relation to the historical poultry operation, and the previous grading and development that occurred on the proposed project site, the proposed project is unlikely to contain hazardous materials that would create a significant hazard to

the public or the environment. Therefore, impacts associated with hazardous materials sites would be less than significant.

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

No Impact

The CSUSM campus is not located within two miles of a public use airport. The closest public airport is McClellan-Palomar Airport, located approximately seven miles west of the campus. According to the McClellan-Palomar Airport Land Use Compatibility Plan (San Diego County Regional Airport Authority [SDCRAA] 2004), the campus is not located within the Airport Influence Area, which is generally the area in which current and future airport-related noise, overflight, safety, and/or airspace protection factors may affect land uses or necessitate restrictions on the uses. Therefore, the proposed project would not result in a safety hazard associated with a public use airport for people residing or working on campus. No impact would occur.

f) For a project within the vicinity of a private airstrip, would the project result in safety hazard for people residing or working in the project area?

No Impact

The CSUSM campus is not located within the immediate vicinity of a private airstrip. The closest private airstrip is Pat Coyle Memorial Heliport, located approximately two miles northeast of the campus. Use of the heliport is intermittent and heliport operations would not create a safety hazard at the proposed project site due to the distance of the heliport to the campus. Therefore, the proposed project would not result in a safety hazard associated with a private airstrip for people residing or working on campus. No impact would occur.

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

Less Than Significant Impact with Mitigation Incorporated

The proposed project may require temporary lane closures on Palm Canyon Drive during construction. Under current CSUSM procedures, multiple emergency/evacuation routes are provided to ensure that temporary lane closures do not physically interfere with emergency access. However, temporary lane closures could potentially impair the delivery of emergency services if emergency responders are not aware of the temporary change in the campus circulation pattern. This is a potentially significant impact; however, implementation of mitigation measure Haz-1 (detailed below) would reduce impacts to a less than significant level.

Haz-1 For any temporary lane closure required during project construction, the construction contractor and/or the CSUSM Planning, Design and Construction staff shall notify the CSUSM University Police of the location and timing of the closure prior to the start of construction. If determined necessary by the CSUSM University Police, local emergency services, including the San Marcos Fire Department and appropriate ambulance services, shall also be notified.

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?

Less Than Significant Impact

The proposed project consists of the construction of a new building on an undeveloped portion of the CSUSM campus located adjacent to academic building (FCB). Undeveloped portions of the campus contain large areas of natural vegetation that are prone to the spread of wildland fires during the dry summer months, which would potentially expose people or structures on campus to risks associated with wildland fires. However, all campus development plans are reviewed by the State Fire Marshall to ensure compliance with the California Fire Code, including the installation of fire sprinklers, fire alarms, fire retardant construction materials, and other types of built-in fire protection measures, minimizing risks to people and structures in the event of a wildland fire. Furthermore, CSUSM would continue to adhere to fire clearance standards which prohibit the accumulation of unnecessary weeds, grass, and vegetation around buildings and structures in order to prevent fire hazards associated with overgrowth. Therefore, impacts associated with wildland fires would be less than significant.

6.9 Hydrology and Water Quality

Would the project:

a) Violate any water quality standards or waste discharge requirements?

Less Than Significant Impact

Construction. Construction of the proposed project would generate pollutants that could potentially degrade the surface water quality of downstream receiving waters. Sediment associated with earth-moving activities and exposed soil is the most common pollutant associated with construction sites. Other pollutants associated with construction include debris, trash, and other materials generated during construction activities; hydrocarbons from leaks or spills of fuels, oils, and other fluids associated with construction equipment; and paints, concrete slurries, asphalt materials, and other hazardous materials. Storm water and non-storm water runoff would potentially carry these pollutants off site and into the CSUSM campus drainage system, which discharges to downstream receiving waters that ultimately drain to the Pacific Ocean. However, the construction contractor would obtain voluntary coverage for the proposed project under the NPDES Construction General Permit, and to prepare and implement a SWPPP prior to construction. The SWPPP would identify site-specific BMPs to control erosion, sediment, and other potential construction-related pollutants, including, but not limited to, the following:

- Proper storage, use, and disposal of construction materials.
- Removal of sediment from surface runoff before it leaves the project site by silt fences or other similar devices around the site perimeter, with particular attention to protecting water bodies identified as impaired due to sediment on the Section 303(d) List of Water Quality Limited Segments, such as San Marcos Creek.
- Protection of all storm drain inlets on site or downstream of the project site to eliminate entry of sediment.
- Stabilization of cleared or graded slopes.
- Diversion of runoff from uphill areas around disturbed areas of the project site.

- Prevention of tracking soil off site through use of a gravel strip or wash facilities at exits from the project site.
- Protection or stabilization of stockpiled soils.

Compliance with the NPDES Construction General Permit would maintain downstream water quality in accordance with RWQCB standards, such that construction of the proposed project would not violate any water quality standards or waste discharge requirements. Therefore, construction-related impacts to water quality would be less than significant.

Operation. Operation of the proposed project would generate pollutants that could potentially degrade the surface water quality of downstream receiving waters. Table 9 summarizes the potential pollutants associated with operational activities at the new EL Building. Storm water and non-storm water runoff would potentially carry these pollutants off site and into the CSUSM campus drainage system, which discharges to downstream receiving waters that ultimately drain to the Pacific Ocean.

Table 9 Potential Pollutants Generated by Extended Learning Building Operational Activities

Activity/Source	Pollutants of Concern
Building maintenance (washing, graffiti abatement)	Wash water, paint chips, cleaning products, dirt and sediment
Grounds maintenance	Organic pollutants, trash, debris, cleaning compounds, diesel, paint, hazardous materials
Impervious areas	Increased flows, pollutant loadings - oil and grease, sediment, heavy metals
Public buildings	Trash, debris, litter, organic materials and substances
Roof runoff	Particulate matter and associated pollutants
Sewer line blockages	Raw sewage spills
Sewer line seepage	Raw sewage spills, leaks
Trash storage areas	Organic materials, hazardous materials, litter, debris
Utility line maintenance and repairs (water/ irrigation/ sewer)	Chloramines, chlorine, sediment, adhesive cements, primers & fire protection systems

Source: Atkins & LaRoc Environmental 2015

The 2015 CSUSM SWMP identifies post-construction design standards and BMPs for facilities operation and maintenance to mitigate impacts to downstream water quality due to pollutants associated with operational activities on campus (Atkins & LaRoc Environmental 2015). The 2015 SWMP complies with the Countywide Model SUSMP developed by the San Diego Stormwater Committees for the Phase I MS4 Permit. The SUSMP requirements are applicable to most other development in region but not directly applicable to CSUSM as a state facility that is independent of local land use and development requirements generally governed by local jurisdictions. The 2015 SWMP implements the most current MS4 permit requirements. Therefore, impacts to water quality from operation of the proposed project would be less than significant.

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)?

Less than Significant Impact

The CSUSM campus is provided water service by the VWD. The proposed project would use water supplied by the VWD via the existing on-campus water distribution system and would not include the use of groundwater supplies. Thus, the proposed project would not substantially deplete groundwater supplies.

The project site was previously graded and is currently undeveloped. The proposed project would construct a new building on the project site, which would increase the amount of impervious surfaces. However, since the CSUSM campus is developed, the slight increase in impervious surfaces would be insignificant and would not interfere substantially with groundwater recharge. Furthermore, the area is not known to support significant groundwater resources used by local agriculture, industry, or residences. Therefore, impacts to groundwater would be less than significant.

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?

Less Than Significant Impact with Mitigation Incorporated

Construction. Construction of the proposed project would temporarily alter the localized drainage pattern at the project site due to ground disturbing activities, such as grading and excavation, construction of new building foundations, and trenching for utilities. Such alterations in the drainage pattern may temporarily result in erosion or siltation and/or increase the rate or amount of surface runoff if substantial drainage is rerouted. However, voluntary compliance with the NPDES Construction General Permit, which requires the development of a SWPPP, would minimize the potential for erosion or siltation and flooding through the implementation of BMPs, such as those listed in Section 6.6(b). Therefore, impacts associated with temporary drainage alterations during construction would be less than significant.

Post-Construction. Once construction is completed, any remaining disturbed soils would be stabilized with xeriscape landscaping methods to prevent erosion and siltation at the project site. However, the proposed project would increase the amount of impervious surfaces at the project site and would alter the localized drainage pattern at the project site, which may increase the rate or amount of surface runoff and/or exceed the capacity of existing storm drain systems, thereby increasing the potential for flooding. This represents a potentially significant impact; however, implementation of mitigation measure Hyd-1 (detailed below) would reduce impacts to a less than significant level by establishing a performance standard for future flows and requiring a drainage study prepared by a registered engineer.

Hyd-1 Prior to occupancy of the proposed EL Building, a registered engineer shall perform a drainage study for the proposed project commissioned by the CSUSM Planning, Design and Construction or Facility Services departments that complies with the following conditions:

i. Site design that controls runoff discharge volumes and durations shall be utilized where applicable.

ii. Measures that protect slopes and channels such as energy dissipaters, vegetation, and slope/channel stabilizers shall be applied where appropriate.

iii. The development shall maintain the peak runoff for the 10-year and 6-hour storm event. If determined necessary by the registered engineer, in coordination with CSUSM, maintenance of peak runoff for a larger storm may be required.

Design measures shall be consistent with the 1988 Master Plan (CRSS Architecture Group) and 2015 SWMP (Atkins & LaRoc Environmental), in operation prior to occupancy of the new EL Building, and regularly maintained by CSUSM. In addition, the proposed project shall comply with the provisions of California Government Code 54999 related to funding for capital improvements.

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?

Less Than Significant with Mitigation Incorporated

Refer to discussion in Section 6.9(c) above.

e) Create or contribute runoff water which would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff?

Less Than Significant with Mitigation Incorporated

Refer to discussion in Sections 6.9(a) and 6.9(c) above.

f) Otherwise substantially degrade water quality?

Less Than Significant Impact

Refer to discussion in Section 6.9(a) above.

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?

No Impact

The proposed project is the construction of a new EL Building. The CSUSM campus is located in Flood Zone X, which is outside of the 100-year and 500-year flood hazard areas (FEMA 2012). Therefore, the proposed project would not place any structures within a 100-year flood hazard area. No impact would occur.

h) Place within a 100-year flood hazard area structures which would impede or redirect flood flows?

No Impact

Refer to the discussion in Section 6.9(g) above.

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?

No Impact

The CSUSM campus is located within the San Marcos Creek watershed. San Marcos Creek has been impounded at its lower end to create Lake San Marcos; however, the Lake San Marcos dam is located downstream, approximately 2.5 miles west of the campus. There are no dams located upstream of the campus. As such, the project site is not located within a dam inundation area for dam failure (SanGIS

2012). Therefore, the proposed project would not expose people or structures to a significant risk of loss, injury, or death involving flooding, including as a result of the failure of a levee or dam. No impact would occur.

j) Expose people or structures to inundation by seiche, tsunami, or mudflow?

Less Than Significant Impact

A seiche is a wave on the surface of a lake or landlocked bay that is caused by atmospheric or seismic disturbances. The closest lakes are Discovery Lake and South Lake, located approximately one mile southwest of the CSUSM campus. Due to the small size of these lakes and their distance from the project site, the proposed project would not expose people or structures to inundation by seiche.

A tsunami is a very large ocean wave caused by an underwater earthquake or volcanic eruption. The CSUSM campus is located approximately nine miles inland from the Pacific Ocean and lies at an average elevation of approximately 700 feet above mean sea level. Due to the elevation of the project site and its distance from the ocean, the proposed project would not expose people or structures to inundation by tsunami.

Mudflows are shallow water-saturated landslides that travel rapidly down slopes carrying rocks, brush, and other debris. Typically, mudflows occur during or soon after periods of heavy rainfall on slopes that contain loose soil or debris. The CSUSM campus is located adjacent to a ridge; however, and the grade is relatively shallow and the hillside is covered with native vegetation, which increases slope stability. Thus, it is unlikely that the project site would be subject to inundation by a mudflow. Impacts associated with mudflows would be less than significant.

6.10 Land Use and Planning

Would the project:

a) Physically divide an established community?

No Impact

The proposed project consists of the construction of a new EL Building and relocation of utilities infrastructure within the CSUSM campus, and would not include any off-campus development that would encroach on the surrounding San Marcos community. As such, the proposed project would not physically divide an established community. No impact would occur.

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?

No Impact

CSUSM is a part of the CSU system, an entity of the State of California, which is not subject to municipal plans, policies, and regulations, such as county and/or city general plans or local ordinances. Thus, the CSUSM campus is not part of or subject to the City of San Marcos General Plan. The applicable land use plan is the 1988 Master Plan for the CSUSM campus prepared by CRSS Architecture Group, which contains specific guiding principles for planning and design of the neighborhoods, buildings, parking areas, stradas, plazas, courtyards, arcades, and landscaping on campus. The 1998 Master Plan intentionally groups similar land uses together, such as locating on-campus residentially-scaled development near surrounding

residential development to act as buffers. The proposed project is consistent with the 1988 Master Plan for the CSUSM campus, which includes the provision of additional academic facilities on campus. Therefore, the proposed project would not conflict with any applicable land use plan, policy, or regulation. No impact would occur.

c) Conflict with any applicable habitat conservation plan or natural community conservation plan?

No Impact

As discussed in Section 6.10(b) above, as a state entity, CSUSM is not subject to municipal plans, policies, and regulations. Thus, although the CSUSM campus is located within the boundaries of the North County MHCP Plan and the Draft City of San Marcos Subarea Plan, the campus is not covered by or subject to these plans. No impact would occur.

6.11 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?

No Impact

The CSUSM campus, which is underlain by tonalite deposits, has been classified by the California Geological Survey as Mineral Resource Zone 2 (MRZ-2; CGS 2010). The MRZ-2 classification denotes areas underlain by mineral deposits where geologic data show that potentially significant mineral resources are present, and any planned development must consider access to the deposits for purposes of extraction. Almost one third of the campus (92 acres) is considered to be unbuildable because of the steeply sloping terrain, associated access difficulties, and cost of construction. These unbuildable areas in the eastern and southern portions of campus, which also contain the most significant amount of tonalite resources on campus, would allow for conservation of and access to these mineral resources for potential future extraction. Construction within the proposed project site would not obstruct access to, or future potential mineral extraction in, these areas. Therefore, No impact would occur.

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?

No Impact

CSUSM is a part of the CSU system, an entity of the State of California, which is not subject to municipal plans, policies, and regulations, such as county and/or city general plans or local ordinances. Irrespective of this exception, the City of San Marcos General Plan does not recognize any locally important mineral resources recovery sites within the City of San Marcos, including the CSUSM campus (City of San Marcos 2012). No impact would occur.

6.12 Noise

Would the project:

a) Expose persons to or generate noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?

Less Than Significant with Mitigation Incorporated

See the discussions provided in Sections 6.12(c) and 6.12(d) below.

b) Expose persons to or generate excessive groundborne vibration or groundborne noise levels?

Less Than Significant Impact

Construction of the proposed project would generate temporary groundborne vibration and groundborne noise caused by construction activities and equipment. Vibration-sensitive instruments and operations may require special consideration during construction. Since the criteria for vibration-sensitive instruments and operations are generally not defined and are often case specific, the criteria must be determined based on manufacturer specifications and recommendations by the equipment user. As a guide, major construction activities within 200 feet would be potentially disruptive to vibration-sensitive instruments and operations (Caltrans 2002). The proposed project may result in groundborne vibration generated by heavy earthmoving equipment associated with proposed project construction. The closest facility with vibration-sensitive instruments is Science Hall I, which is located approximately 255 feet northwest of the project site. Operation of the proposed project would not involve any activities that generate substantial groundborne vibration or groundborne noise. Therefore, vibration from construction would not result in a significant impact to any vibration-sensitive receptors.

c) Cause a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?

Less Than Significant Impact

Construction of the proposed project would generate temporary increases in ambient noise levels, as discussed in Section 6.12(d) below. Operation of the proposed project would generate noise associated with normal building usage activities such as human conversation, opening and closing of doors and windows, and HVAC equipment. Since the project site is located near campus buildings of similar size and associated collegiate uses, the increased operational noise associated with one additional campus building within an existing developed campus neighborhood would not cause a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project.

The project would also have the potential to increase traffic noise on surrounding roadways. As discussed in greater detail in Section 16 (Transportation and Traffic) the proposed project would generate 1,028 average daily trips (ADT). Existing traffic noise levels were modeled using standard noise modeling equations adapted from the Federal Highway Administration (FHWA) noise prediction model. This model takes into account traffic volumes, vehicle mix, vehicle speed, and roadway configuration. Table 10 compares existing and future noise levels with and without the project on the primary roadways that would serve the project. Traffic volumes are provided in the traffic analysis prepared for the project (LLG Engineers 2016). As shown in Table 10, the proposed project would result in an increase in the traffic noise level of 0.1 db or less on modeled roadway segments when compared to existing or future conditions without the project. This level of increase is which is not discernible to the human ear. Therefore, impacts associated with a permanent increase in ambient noise levels would be less than significant.

Table 10 Existing and Future Traffic Noise Levels (dBA CNEL)

Roadway Segment	Existing Scenario		Cumulative Scenario (2020)	
	Existing	Existing + Project	No Project	With Project
Twin Oaks Valley Road				
North of Barham Dr. / Discovery St.	76.7	76.8	77.9	78.0
Barham Dr. / Discovery St. to Craven Rd.	72.7	72.8	74.8	74.9
Barham Drive				
Twin Oaks Valley Rd. to Campus Way	69.6	69.6	71.6	71.6
Campus Way to Industrial St.	69.4	69.5	71.6	71.6

Note: All noise levels at 50 feet from the roadway centerline.
Source: LLG Engineers 2016 (traffic data). See Appendix B for noise inputs.

d) Cause a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?

Less Than Significant with Mitigation Incorporated

Construction of the proposed project would generate temporary increases in ambient noise levels caused by construction activities and equipment. Construction-related noise levels would vary depending on the distance between the source and receptors, as well as the type of equipment used, how it is operated, and how well the equipment is maintained. The proposed project would implement conventional construction techniques and standard equipment, such as scrapers, graders, backhoes, loaders, tractors, cranes, and miscellaneous trucks. Noise levels of typical construction equipment range from 60 to 90 dBA Leq at 50 feet from the source (FHWA 2006). Noise from construction equipment, which has point source acoustical characteristics, typically attenuates at a rate of 6 dBA per doubling of distance from the source (assuming propagation of sound waves via direct line-of-sight and with no ground interaction).

Noise-sensitive receptors include on-campus academic uses (libraries, administrative offices, and classrooms). Due to the proximity of the academic buildings (Foundation Classroom Buildings, Craven Hall, Academic Hall, Markstein Hall, and Science Hall I) to the project site, students and faculty/staff members using or residing in these facilities would be exposed to elevated noise levels during construction that may disrupt communication and routine activities

As CSUSM has no adopted noise standards, the noise standards from the City of San Marcos Noise Ordinance (San Marcos Municipal Code Chapter 10.24) are used as significance thresholds for the purposes of this analysis. Based on the City's standards for short-term or intermittent noise sources, construction-related exterior noise levels that exceed a one-hour average of 60 dBA Leq at academic (libraries, administrative offices, and classrooms) and commercial uses, 55 dBA Leq at residential uses would result in a significant impact. Average noise levels would typically be less than peak noise levels because construction equipment operates in alternating cycles of power (i.e., full power and low power) and rotates/moves around the project site exposing different sides (i.e., louder side and quieter side) to receptors, especially during clearing and grading activities. For the proposed project, it is assumed that the average construction-related exterior noise levels would potentially exceed the significance thresholds for academic, commercial, and residential uses. This represents a potentially significant impact; however, implementation of mitigation measure Noi-1 (detailed below) would reduce this impact to a less than significant level. Furthermore, disturbances to nighttime noise-sensitive receptors would be avoided because construction activities would occur between the hours of 7:00 a.m. and 4:00 p.m., Monday

through Friday. Potential construction activities occurring outside of these times (or on legal holidays) would be limited to emergency conditions or situations where advance approval is received by CSUSM.

Noi-1 The construction contractor shall implement the following measures during construction to minimize temporary increases in ambient noise levels caused by construction activities and equipment. Measures to reduce construction-related noise shall include, but not be limited to, the following:

i. Properly outfit and maintain construction equipment with manufacturer-recommended noise-reduction devices.

ii. Operate all diesel equipment with closed engine doors and equip with factory-recommended mufflers.

iii. Use electrical power to operate air compressors and similar power tools.

iv. Employ additional noise attenuation techniques, as needed, to reduce excessive noise levels. Such techniques shall include, but not be limited to, the construction of temporary sound barriers or sound blankets between the project site and nearby noise-sensitive receptors.

v. Post a sign on campus informing all workers and subcontractors of the time restrictions for construction activities. The sign should also include the CSUSM telephone numbers where complaints associated with construction-related noise can be submitted.

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?

No Impact

The CSUSM campus is not located within two miles of a public use airport. The closest public airport is McClellan-Palomar Airport, located approximately seven miles west of the campus. According to the McClellan-Palomar Airport Land Use Compatibility Plan (SDCRAA 2004), the campus is not located within the airport influence area and lies outside of the 60-dB CNEL airport noise contour. Therefore, the proposed project would not expose people at the new EL Building to excessive noise levels associated with a public airport or public use airport. No impact would occur.

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?

No Impact

There are no private airstrips located in the immediate vicinity of the CSUSM campus. The closest private airstrip is Pat Coyle Memorial Heliport, located approximately two miles northeast of the campus. Use of the heliport is intermittent and noise from heliport operations would not be audible on campus due to the distance. Therefore, the proposed project would not expose people at the new EL Building to excessive noise levels associated with a private airstrip. No impact would occur.

6.13 Population and Housing

Would the project:

a) Induce substantial 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)?

No Impact

The purpose of the proposed project is to construct a new EL Building on the CSUSM campus. In the near-term, the project would serve the existing campus by relocating existing projects. In the long-term (3-5 years), the proposed project would expand the EL Department and is anticipated to serve is anticipated to serve up to approximately 1,655 full-time equivalent students (FTES). The project does not propose housing or businesses, or the extension of roads or other infrastructure which could induce growth. Therefore, No impact would occur.

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

No Impact

The project site is currently undeveloped. Therefore, development of the proposed EL Building on the project site would not displace any existing housing. No impact would occur.

c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?

No Impact

The project site is currently undeveloped. Therefore, development of the proposed EL Building on the project site would not displace any people. No impact would occur.

6.14 Public Services

Would the project:

a) Result in substantial adverse physical impacts associated with the provision of or 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 public services:

i) Fire Protection?

Less Than Significant Impact

The SMFD currently provides fire protection services for the CSUSM campus. The proposed project would result in the construction of a new EL Building next to the existing FCB, which would require fire protection services from the SMFD. The existing FCB is currently served by the SMFD. The EL Building would be used by students, faculty, and staff for academic or related activities. The construction of the EL Building is consistent with the 1988 Master Plan, which identifies the provision of additional academic facilities on campus. Thus, the proposed project has been planned for the past 25 years and would comply with all applicable state fire codes. Therefore, impacts to fire protection would be less than significant.

ii) Police Protection?

Less Than Significant Impact

The CSUSM Police Department provides police protection and public safety services for the CSUSM campus. The proposed project would result in the construction of a new EL Building next to the existing FCB, which would require police protection and public safety services from the CSUSM Police Department. However, as discussed in Section 6.13(a) above, the proposed project would not induce significant population growth on campus or in the City of San Marcos. The EL Building would be used by students, faculty, and staff for academic or related activities. The construction of the EL Building is consistent with the 1988 Master Plan, which identifies the provision of additional academic facilities on campus. Thus, the proposed project has been planned for the past 25 years. Impacts to police protection would be less than significant.

iii) Schools?

Less Than Significant Impact

The proposed project would result in the construction of a new EL Building on the CSUSM campus. As discussed in Section 6.13(a) above, the proposed project would not induce significant growth on campus or in the City of San Marcos. Therefore, impacts to the demand for school services or facilities would be less than significant.

iv) Parks?

Less Than Significant Impact

The proposed project would result in the construction of a new EL Building on the CSUSM campus. As discussed in Section 6.13(a) above, the proposed project would not induce significant growth on campus or in the City of San Marcos. Therefore, impacts to the demand for off-campus park services or facilities would be less than significant.

v) Other public facilities?

Less Than Significant Impact

The proposed project would result in the construction of a new EL Building on the CSUSM campus. As discussed in Section 6.13(a) above, the proposed project would not induce significant growth on campus or in the City of San Marcos. Therefore, impacts to the demand for other public services or facilities, such as libraries, would be less than significant.

6.15 Recreation

Would the project:

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

No Impact

The proposed project would result in the construction of a new EL Building on the CSUSM campus. As discussed in Section 6.13(a) above, the proposed project would not induce significant growth on campus or in the City of San Marcos. Therefore, no impact to off-campus recreational facilities would occur.

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

No Impact

The proposed project would result in the construction of a new EL Building on the CSUSM campus and would be used by students, faculty, and staff for academic or related activities. Therefore, the proposed project would not include or require the development of recreational facilities. No impact would occur.

6.16 Transportation/Traffic

A Traffic Impact Analysis report was prepared for the proposed project (LLG Engineers 2016). This report is provided as Appendix C and is summarized in this section below.

Would the project:

a) Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?

Less Than Significant Impact

The proposed project site footprint is approximately 20,000 SF, located in the southeastern portion of the CSUSM campus, east of Palm Canyon Drive, directly adjacent to the existing FCB. The proposed new 52,300 SF structure is planned to include offices, meeting/conference rooms, classrooms, lecture halls, computer labs, science labs, research space, and lab storage rooms among other amenities. The project is expected to serve approximately 715 additional FTE students at opening day, in addition to the existing 940 FTES, for credited programs. Due to the existing development on the CSUSM campus, the campus already generates traffic on surrounding roadways. Implementation of the proposed project would contribute additional traffic to these roadways during project operations. The traffic impact analysis includes documentation of existing conditions, analyses of cumulative traffic conditions, and identification of project-related impacts at the following intersections and street segments:

Intersections:

1. Barham Drive / Twin Oaks Valley Road
2. Barham Drive / Campus Way
3. Barham Drive / Industrial Street
4. Craven Road / Twin Oaks Valley Road

Street Segments:

1. Twin Oaks Valley Road
   - North of Barham Drive / Discovery Street
   - Barham Drive / Discovery Street to Craven Road
2. Barham Drive
   - Twin Oaks Valley Road to Campus Way
   - Campus Way to Industrial Street

Analysis Approach and Methodology

Level of service (LOS) is the term used to denote the different operating conditions which occur on a given roadway segment under various traffic volume loads. It is a qualitative measure used to describe a quantitative analysis taking into account factors such as roadway geometries, signal phasing, speed, travel delay, freedom to maneuver, and safety. Level of service provides an index to the operational qualities of a roadway segment or an intersection. Level of service designations range from A to F, with LOS A representing the best operating conditions and LOS F representing the worst operating conditions. Level

of service designation is reported differently for signalized and unsignalized intersections, as well as for roadway segments.

Intersections

Signalized intersections were analyzed under AM and PM peak hour conditions. Average vehicle delay was determined utilizing the methodology found in Chapter 18 of the 2010 Highway Capacity Manual (HCM), with the assistance of the Synchro (version 9) computer software. The delay values (represented in seconds) were qualified with a corresponding intersection Level of Service (LOS). A more detailed explanation of the methodology are attached in Appendix C.

Unsignalized intersections were analyzed under AM and PM peak hour conditions. Average vehicle delay and Levels of Service (LOS) was determined based upon the procedures found in Chapter 19 and Chapter 20 of the 2010 Highway Capacity Manual (HCM), with the assistance of the Synchro (version 9) computer software. A more detailed explanation of the methodology are attached in Appendix C.

Street Segments

Street segment analysis is based upon the comparison of daily traffic volumes (ADTs) to the City of San Marcos Roadway Classification, Level of Service, and ADT table. This table provides segment capacities for different street classifications, based on traffic volumes and roadway characteristics. The City of San Marcos Roadway Classification, Level of Service, and ADT table is attached in Appendix C.

Significance Criteria

A project is considered to have a significant impact if the new project traffic has decreased the operations of surrounding roadways by a defined threshold. The defined thresholds shown in Table 11 below for roadway segments and intersections are based on San Diego Traffic Engineers' Council (SANTEC) significance criteria. If the project exceeds the thresholds in Table 11, then the project may be considered to have a significant project impact. A feasible mitigation measure will need to be identified to return the impact within the thresholds (pre-project + allowable increase) or the impact will be considered significant and unmitigated.

The impact is designated either a "direct" or "cumulative" impact. "Direct" traffic impacts are those projected to occur at the time a proposed development becomes operational, including other developments not presently operational but which are anticipated to be operational at that time (near term). "Cumulative" traffic impacts are those projected to occur at some point after a proposed development becomes operational, such as during subsequent phases of a project and when additional proposed developments in the area become operational (short-term cumulative) or when affected community plan area reaches full planned buildout (long-term cumulative). For intersections and roadway segments affected by a project, level of service (LOS) D or better is considered acceptable under both direct and cumulative conditions.

If the project exceeds the thresholds in Table 11, then the project may be considered to have a significant "direct" or "cumulative" project impact. A significant impact can also occur if a project causes the Level of Service to degrade from D to E, even if the allowable increases in Table 11 are not exceeded. A feasible mitigation measure will need to be identified to return the impact within SANTEC thresholds, or the impact will be considered significant and unmitigated.

Table 11 Traffic Impact Significant Thresholds

Level of Service with Project[1]	Allowable Increase Due to Project Impacts[2]		
	Roadway Segments		Intersections
	V/C	Speed (mph)	Delay (sec.)
D, E & F	0.02	1	2

V/C = Volume to Capacity Ratio
Speed = Arterial speed measured in miles per hour
Delay = Average stopped delay per vehicle measured in seconds for intersections, or minutes for ramp meters.
LOS = Level of Service
(1) All level of service measurements are based upon HCM procedures for peak-hour conditions. However, V/C ratios for Roadway Segments may be estimated on an ADT/24-hour traffic volume basis. The acceptable LOS for roadways, and intersections is generally "D" ("C" for undeveloped or not densely developed locations per jurisdiction definitions).
(2) If a proposed project's traffic causes the values shown in the table to be exceeded, the impacts are deemed to be significant. These impact changes may be measured from appropriate computer programs or expanded manual spreadsheets. The project applicant shall then identify feasible mitigations (within the Traffic Impact Study [TIS] report) that will maintain the traffic facility at an acceptable LOS. If the LOS with the proposed project becomes unacceptable (see note (1) above), the project applicant shall be responsible for mitigating significant impact changes.
Source: LLG Engineers 2016

Existing Traffic Volumes

The most recent available average daily traffic volumes (ADTs) were generated from LLG counts conducted in October 2015 with the exception of one count conducted in April 2015. Counts at the study area intersections, including bicycle and pedestrian counts conducted between the hours of 7:00-9:00 AM and 4:00-6:00 PM, were obtained from previous studies in the project area including counts that were done in 2013. A growth factor of 4% was applied to the traffic volumes from 2013 based on growth trends seen from counts conducted in recent years around the area. The results of the existing conditions are shown in Table 12. All study intersections and street segments currently operate at acceptable LOS C or better.

Table 12 Existing Traffic Volumes

Street Segment	ADT	Date	Source
Twin Oaks Valley Road			
North of Barham Dr. / Discovery St.	45,946	October 2015	LLG
Barham Dr. / Discovery St. to Craven Rd.	32,796	October 2015	LLG
Barham Drive			
Twin Oaks Valley Rd. to Campus Way	45,000	October 2015	LLG
Campus Way to Industrial St.	45,500	April 2015	LLG

Trip Generation and Distribution

The trip generation rates for the CSUSM Extended Learning Building were obtained from SANDAG's (Not So) Brief Guide of Vehicular Traffic Generation Rates for the San Diego Region, April 2002. The standard university rate was utilized as it best reflects the proposed land use. The project is expected to serve approximately 715 additional FTE students on opening day (spring of 2018). Table 13 tabulates the project traffic generation. The project is calculated to generate 1,716 ADT with 138 inbound / 34 outbound trips during the AM peak hour and 46 inbound / 108 outbound trips during the PM peak hour.

The project traffic was distributed and assigned to the street system based on the project's proximity to state highways and arterials. Figure 5 shows the project traffic distribution.

Table 13 Project Trip Generation

Land Use	Size	Daily Trip Ends (ADTs)		AM Peak Hour					PM Peak Hour				
		Rate[1]	Volume	% of ADT	In:Out Split	Volume In	Volume Out	Volume Total	% of ADT	In:Out Split	Volume In	Volume Out	Volume Total
Extended Learning Building	715 FTE	2.4 /FTE	1,716	10%	80:20	138	34	172	9%	30:70	46	108	154
Total		—	1,716	—	—	138	34	172	—	—	46	108	154

[1] Rate is based on SANDAG's (Not So) Brief Guide of Vehicular Traffic Generation Rates for the San Diego Region, April 2002.
Source: LLG Engineers 2016

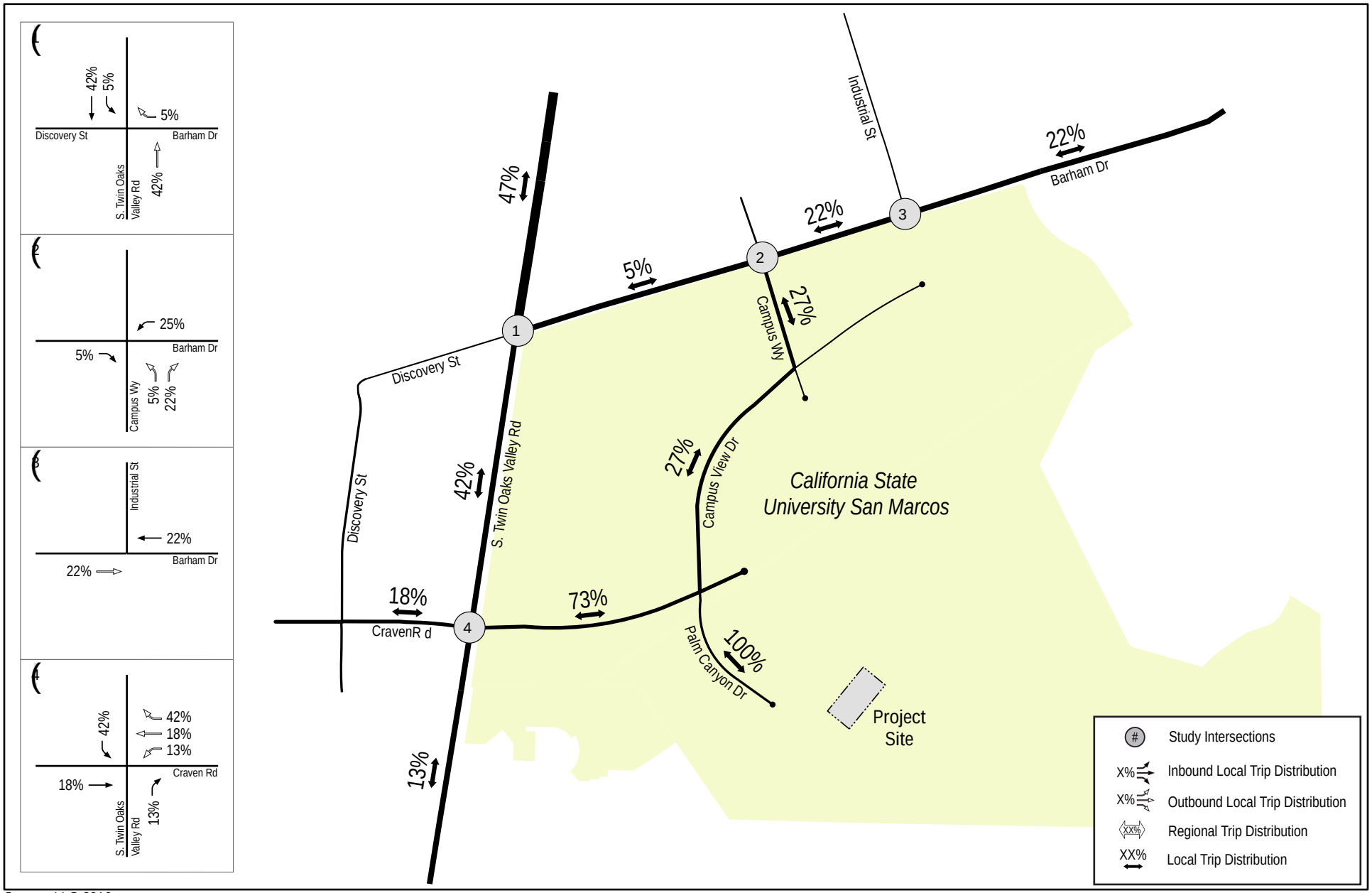
Existing Plus Project Conditions

The existing plus project scenario is a hypothetical scenario that assumes completion of the project and full absorption of the project traffic on the surrounding street network at the current time. Project-related peak hour trips were added to the existing peak hour volumes to evaluate existing plus project conditions. An intersection LOS analysis was conducted for AM/PM peak hours. The results of the intersection analysis are shown in Table 14, and the results of the street segment analysis are shown in Table 15. As shown in Table 14, with the addition of the project traffic all study intersection and street segments would continue to operate at acceptable LOS D or better. Based on the SANTEC significance criteria, the project impact would be less than significant.

Table 14 Existing Plus Project Intersection Operations

Intersection	Control Type	Peak Hour	Existing		Existing + Project		Delay Δ[3]	Impact Type
			Delay[1]	LOS[2]	Delay[1]	LOS[2]		
Barham Drive / Twin Oaks Valley Road	Signal	AM	34.0	C	34.2	C	0.2	None
		PM	46.6	D	48.1	D	1.5	
Barham Drive / Campus Way	Signal	AM	31.4	C	32.4	C	1.0	None
		PM	37.4	D	37.9	D	0.5	
Barham Drive / Industrial Street	OWSC[4]	AM	13.8	B	14.1	B	0.3	None
		PM	16.5	C	16.8	C	1.3	
Craven Road / Twin Oaks Valley Road	Signal	AM	32.4	C	34.1	C	1.7	None
		PM	40.7	D	42.2	D	1.5	

[1] Average delay expressed in seconds per vehicle.
[2] Level of Service.
[3] Δ denotes the increase in delay due to project.
[4] OWSC = One-Way Stop Controlled intersection. Minor street left turn delay is reported.
Source: LLG Engineers 2016



Source: LLG 2016

ATKINS

No Scale

PROJECT TRIP DISTRIBUTION
FIGURE 5

Table 15 Existing Plus Project Street Segment Operations

Street Segment	Existing Capacity (LOS E)[1]	Existing			Existing + Project			Δ[5]	Impact Type
		ADT[2]	LOS[3]	V/C[4]	ADT[2]	LOS[3]	V/C[4]		
Twin Oaks Valley Road									
North of Barham Dr. / Discovery St.	70,000	45,946	C	0.656	46,753	C	0.668	0.012	None
Barham Dr. / Discovery St. to Craven Rd.	60,000	32,796	B	0.547	33,517	B	0.559	0.012	None
Barham Drive									
Twin Oaks Valley Rd. to Campus Way	45,000	18,209	B	0.405	18,295	B	0.407	0.002	None
Campus Way to Industrial St.	45,500	17,606	B	0.391	17,984	B	0.400	0.009	None

(1) Capacities based on City of San Marcos' Roadway Classification table.
(2) Average Daily Traffic.
(3) Level of Service.
(4) Volume to Capacity ratio.
(5) Denotes increase in delay due to project traffic
Source: LLG Engineers 2016

Near-Term Conditions

The near-term conditions scenario looks at the project impact contribution with other cumulative projects within the project area. Based on research and discussions with City staff, cumulative projects were identified, shown in Table 9-1 in Appendix C. Land use assumptions contained in the Near-term SANDAG Series 11 North County Model within the project area were reviewed and the cumulative projects which were not already included in the model were added. In order to account for other unforeseen cumulative projects and regional traffic growth, traffic forecasts from the SANDAG Series 11 North County Model for the Years 2010 and 2020 were also utilized to forecast cumulative projects traffic volumes.

The results of this intersection analysis are shown in Table 16, and the results of the street segment analysis are shown in Table 17. The near-term conditions with the project resulted in all study area intersections calculated to continue to operate at LOS D or better, except for the following:

- Barham Drive / Twin Oaks Valley Road (LOS F during the AM and PM peak hours.
- Craven Road / Twin Oaks Valley Road (LOS F during the PM peak hour).

All study area street segments calculated to operate at LOS D or better except for the following:

- Twin Oaks Valley Road: North of Barham Drive / Discovery Street

Based on CSUSM's SANTEC significance criteria no significant impacts were identified under Existing + Cumulative Projects + Project conditions.

Therefore, the proposed project would not cause additional intersections and street sections to operate at an unacceptable LOS consistent with SANTEC significance criteria and no significant impact would occur from the proposed project. No mitigation measures are required.

Summary

Per SANTEC significance thresholds and the analysis methodology presented in this report, Project related traffic is not calculated to contribute to significant direct or cumulative impacts within the study area. Therefore, no mitigation measures are required.

Table 16 Near-Term Intersection Operations

Intersection	Control Type	Day	Near-Term		Near-Term+ Project		Delay Δ[3]	Impact Type
			Delay[1]	LOS[2]	Delay[1]	LOS[2]		
Barham Drive / Twin Oaks Valley Road	Signal	AM	**127.3**	**F**	**129.1**	**F**	1.8	None
		PM	**167.9**	**F**	**169.3**	**F**	1.4	
Barham Drive / Campus Way	Signal	AM	44.4	D	45.4	D	1.0	None
		PM	53.3	D	54.5	D	1.2	
Barham Drive / Industrial Street	OWSC d	AM	33.3	D	35.1	D	1.8	None
		PM	33.4	D	34.8	D	1.4	
Craven Road / Twin Oaks Valley Road	Signal	AM	48.7	D	50.6	D	1.9	None
		PM	**95.6**	**F**	**97.2**	**F**	1.6	

(1) Average delay expressed in seconds per vehicle.
(2) Level of Service.
(3) Δ denotes the increase in delay due to Project.
(4) OWSC – One-Way Stop Controlled intersection. Minor street left turn delay is reported.

Source: LLG Engineers 2016

SIGNALIZED DELAY/LOS THRESHOLDS	
Delay	LOS
0.0 ≤ 10.0	A
10.1 to 20.0	B
20.1 to 35.0	C
35.1 to 55.0	D
55.1 to 80.0	E
≥ 80.1	F

UNSIGNALIZED DELAY/LOS THRESHOLDS	
Delay	LOS
0.0 ≤ 10.0	A
10.1 to 15.0	B
15.1 to 25.0	C
25.1 to 35.0	D
35.1 to 50.0	E
≥ 50.1	F

Table 17 Near-Term Street Segment Operations

Street Segment	Existing Capacity (LOS E)[1]	Near-Term			Near-Term+ Project			Δ[5]	Impact Type
		ADT[2]	LOS[3]	V/C[4]	ADT[2]	LOS[3]	V/C[4]		
Twin Oaks Valley Road									
North of Barham Dr. / Discovery St.	70,000	60,500	D	0.864	61,307	E	0.876	0.012	None
Barham Dr. / Discovery St. to Craven Rd.	60,000	53,100	D	0.885	53,821	D	0.897	0.012	None
Barham Drive									
Twin Oaks Valley Rd. to Campus Way	45,000	29,050	C	0.646	29,136	C	0.647	0.001	None
Campus Way to Industrial St.	45,500	28,850	C	0.641	29,228	C	0.650	0.009	None

(1) Capacities based on City of San Marcos' Roadway Classification table.
(2) Average Daily Traffic.
(3) Level of Service.
(4) Volume to Capacity ratio.
(5) Δ denotes an increase in delay due to Project traffic. .

Source: LLG Engineers 2016

b) Conflict with an applicable congestion management program, including but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?

Less than Significant Impact

Designated congestion management program (CMP) roadways that serve the CSUSM campus and surrounding City of San Marcos include I-15, SR-78, Palomar Airport Road/San Marcos Boulevard (I-5 to SR-78), and Olivenhain Road/Rancho Santa Fe Road (El Camino Real to SR-78), as identified in the Final 2008 Congestion Management Program Update (SANDAG 2008). As discussed above in Section 6.16(a), the proposed project would not have a significant effect on traffic conditions on the surrounding local circulation system that serves the CSUSM campus and, therefore, would also not significantly impact CMP roadways. Therefore, the proposed project would not conflict with an applicable CMP and impacts would be less than significant.

c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that result in substantial safety risks?

No Impact

The closest public airport is McClellan-Palomar Airport, located approximately seven miles west of the CSUSM campus. According to the McClellan-Palomar Airport Land Use Compatibility Plan (SDCRAA 2004), the campus is not located within the airport influence area of the airport, which is generally the area in which current and future airport-related noise, overflight, safety, and/or airspace protection factors may affect land uses or necessitate restrictions on the uses. Therefore, the proposed project would not result in a change in air traffic patterns. No impact would occur.

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

No Impact

The proposed project would be designed to be consistent with existing surrounding uses and the applicable CSUSM design standards. Furthermore, the proposed project does not include modifications to the existing campus circulation system. Therefore, the proposed project would not substantially increase hazards due to a design feature or incompatible uses. No impact would occur.

e) Result in inadequate emergency access?

Less Than Significant Impact with Mitigation Incorporated

The proposed project may require a temporary lane closure on Campus Way during construction. Under current CSUSM procedures, multiple emergency/evacuation routes are provided to ensure that temporary lane closures do not physically interfere with emergency access. However, temporary lane closures could potentially result in inadequate emergency access if emergency responders are not aware of the changes to the campus circulation patterns. This represents a potentially significant impact; however, implementation of mitigation measure Haz-1 (detailed in Section 6.8(g) above) would reduce impacts to a less than significant level.

f) Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?

Less Than Significant Impact

The existing campus circulation system has been designed to connect the campus by multi-modal techniques both internally (pedestrian pathways and campus shuttle) and externally (SPRINTER light railway and BREEZE bus). Furthermore, the proposed project does not include any modifications to the existing campus circulation system. Therefore, the proposed project would not conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities. A less than significant impact would occur.

6.17 Utilities and Service Systems

Would the project:

a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?

Less Than Significant Impact

The VWD provides wastewater treatment services to the CSUSM campus. In accordance with the Waste Discharge Requirements for all Sewage Collection Agencies in the San Diego Region, the VWD sanitary sewer system has coverage under the Statewide General Waste Discharge Requirements for Sanitary Sewer Systems. The proposed project would include construction of a sewer line to connect the new EL Building to the existing campus sanitary sewer system. The new EL Building would discharge only domestic wastewater to the sanitary sewer system, in compliance with the waste discharge requirements. Therefore, impacts associated with wastewater treatment would be less than significant.

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?

Less Than Significant with Mitigation Incorporated

The proposed project would possibly require the relocation or connection to underground utilities under the proposed building pad to connect the new EL Building to the existing campus water distribution system and sanitary sewer system, respectively, which could potentially cause significant environmental effects. Since relocation and/or connection to existing utilities is part of the proposed project proposed utility improvements have been taken into consideration throughout the discussion of environmental impacts. As discussed in Sections 6.1 – 6.17, all potential impacts would either be less than significant or reduced to a less than significant level with implementation of mitigation measures as described in the Mitigation Monitoring and Reporting Program in Chapter 7.0.

c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?

Less Than Significant with Mitigation Incorporated

The proposed project would possibly require the relocation of the existing storm drain under the proposed building pad, which could potentially cause significant environmental effects. Since relocation of utilities infrastructure is part of the proposed project the proposed storm drain improvements have been taken into consideration throughout the discussion of environmental impacts. As discussed in Sections 6.1 –

6.17, all potential impacts would either be less than significant or reduced to a less than significant level with implementation of mitigation measures as described in the Mitigation Monitoring and Reporting Program in Chapter 7.0.

d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?

Less Than Significant Impact

The VWD provides water service to the CSUSM campus. Currently, the VWD obtains 100 percent of its water supplies from the San Diego County Water Authority, which in turn obtains most of its water from the Metropolitan Water District of Southern California, which obtains its water from northern California via the California State Water Project and from the Colorado River via the Colorado River Aqueduct.

The proposed project is consistent with the 1988 Master Plan for the CSUSM campus, which includes the provision of additional academic facilities on campus. The VWD Master Plan (PBS&J 2010) has evaluated existing and future water demands, including the projected water demand associated with the 1988 Master Plan, to ensure that it has sufficient water supplies to serve its commitments. However, this increase in campus water demand has been accounted for in the 2010 VWD Master Plan as part of the projected water demand associated with the 1988 Master Plan and would not cause the VWD to exceed its available water supplies. Thus, the VWD would have sufficient water supplies available to serve the project from existing entitlements and resources. Therefore, impacts to the VWD's water supply would be less than significant.

e) Result in determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?

Less Than Significant Impact

The VWD provides wastewater treatment services to the CSUSM campus. Wastewater generated on campus is conveyed via the VWD sanitary sewer system to the Encina Water Pollution Control Facility (EWPCF) for treatment and disposal. According to the VWD Master Plan (PBS&J 2010), the VWD's treatment capacity rights at the EWPCF are 7.54 million gallons per day (MGD) of liquids and 10.47 MGD of solids, and the VWD's existing average wastewater flow to the EWPCF is approximately 4.88 MGD. The nominal increase in campus wastewater flow associated with the proposed project, based on generation rates of be 1000 gallons per day/acre, represents less than 1 percent of treatment capacity at the EWPCF, and would not cause the VWD to exceed its treatment capacity rights at the EWPCF. Thus, the VWD has adequate capacity to serve the project's projected demand in addition to its existing commitments. Therefore, impacts to the VWD's wastewater treatment capacity would be less than significant.

f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?

Less Than Significant Impact

There are currently four active landfills and one approved planned landfill within the County of San Diego (not including military landfills), as summarized in Table 18.

Table 18 Permitted Solid Waste Facilities in the County of San Diego

Facility Name	Maximum Permitted Capacity (cubic yards)	Estimated Remaining Capacity (cubic yards)	Maximum Permitted Throughput (tons/day)	Estimated Closure Date
Borrego Landfill	844,000	478,836	50	10/31/2030
Otay Landfill	61,154,000	24,514,904	5,830	02/28/2028
Sycamore Sanitary Landfill	48,124,462	47,388,428	3,965	12/31/2031
West Miramar Sanitary Landfill	87,760,000	16,473,000	8,000	01/31/2017
Gregory Canyon Landfill (future)	57,000,000	57,000,000	5,000	12/31/2034

Source: California Department of Resources Recycling and Recovery (CalRecycle) 2016

Construction of the proposed project would generate a limited amount of solid waste because no excavated fill would be exported from the project site. Operation of the proposed project would result in a slight increase in the amount of solid waste generation on the CSUSM campus. It is anticipated the proposed project would increase annual solid waste generation by 1 pound/student/day on campus which is less than 1 ton per day (CalRecycle 2016). This minor increase in campus solid waste generation would not cause the County's landfills to exceed their maximum permitted throughputs. Thus, the County's landfills have sufficient permitted capacity to accommodate the project's solid waste disposal needs. Therefore, impacts would be less than significant.

g) Comply with federal, state, and local statutes and regulations related to solid waste?

No Impact

In accordance with the California Integrated Waste Management Act of 1989 (AB 939), CSUSM has achieved the target recycling and waste diversion rate of at least 50 percent. The CSUSM Facility Services Department has established a "Green Team" that seeks ways to divert solid waste generated on the CSUSM campus from the landfills. The team identifies opportunities and implements programs to increase the campus's involvement in waste diversion. Recycling containers are placed next to trash cans throughout the campus, and every classroom and office is supplied with blue recycling containers. CSUSM also recycles green waste from campus landscaping. The new EL Building will be incorporated into the campus program to divert 75 percent of solid waste from landfill disposal. Therefore, the proposed project would comply with federal, state, and local statutes and regulations related to solid waste. No impact would occur.

6.18 Mandatory Findings of Significance

Would the project:

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

Less Than Significant Impact

As discussed in Section 6.5 (Cultural Resources) above, the proposed project would result in no impacts to historical resources, known archaeological resources, and paleontological resources. Furthermore, due to the ground disturbance at the project site, which was previously graded and is currently undeveloped, the potential for unknown buried archaeological resources or human remains to occur is low. Therefore, the proposed project would not eliminate important examples of the major periods of California history or prehistory. Impacts would be less than significant.

b) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?

Less Than Significant Impact with Mitigation Incorporated

A cumulative impacts analysis documenting the additive effect of all projects in the same geographic region as the CSUSM campus was completed as part of the 1988 Master Plan EIR. This previous cumulative impacts analysis documented the effects of the 1988 Master Plan in connection with other past, present, and probable future projects, and was discussed in the context of the greater Heart of the City Specific Plan build-out scenario. According to the 1988 Master Plan EIR, build-out of the Heart of the City Specific Plan in conjunction with other cumulative projects would contribute to a change in regional character; demand on the regional circulation system; increase in future noise levels along most roadways; cumulative degradation of regional air quality; reduction in the amount of native habitat in the County; loss of cultural resources; impact on runoff rates/volumes, erosion, water quality, and sedimentation; cumulative impact on the area's geologic features; and incremental impact on all public services and utilities. The previous cumulative impacts analysis included the proposed project as part of the 1988 Master Plan. The following cumulative impacts analysis has been updated to reflect the current cumulative project conditions. Table 19 provides a list of all the past, present, and probable future projects within the CSUSM campus and the City of San Marcos.

The cumulative impacts analysis determines whether the proposed project's incremental effects would be cumulatively considerable when viewed in connection with the effects of past, present, or probable future projects. A cumulative impact is not considered significant if the effect would be essentially the same whether or not the proposed project is implemented. In discussing the cumulative impacts, the following questions will be answered for each environmental topic:

- Overall, will there be a significant cumulative impact?
- If it is determined that a significant cumulative impact exists, would the proposed project's contribution to this significant impact be cumulatively considerable?

Table 19 Cumulative Projects

Project	Location/Description/Status	Potential Cumulative Issues of Relevance
CSUSM Campus Development		
1. CSUSM Physical Master Plan Update	LOCATION: CSUSM campus DESCRIPTION: Plan for the development of academic, housing, parking, operational, and student support facilities to support an increase in student enrollment from approximately 7,526 to 25,000 students by year 2030. STATUS: Construction schedule of Master Plan projects is unknown.	Aesthetics, Air Quality, Geology/Soils, Hazards/ Hazardous Materials, Hydrology/Water Quality, Noise, Traffic/Transportation
City of San Marcos Development		
2. Palomar College Master Plan	LOCATION: Northwest of Las Posas and Mission Road. DESCRIPTION: Proposes to accommodate 1,615 additional students at Palomar College. STATUS: Construction of individual projects underway.	Air Quality, Greenhouse Gas Emissions, Hydrology/Water Quality, Noise, Traffic/Transportation
3. Windy Pointe Development/ University of St. Augustine	LOCATION: 700 Windy Point Drive, (11.88 acres, west side). DESCRIPTION: Physical therapy graduate school campus. STATUS: Three buildings are completed on the west side. Approval for one additional building consisting of administrative offices and classroom are being processed on the east side. Building plans under review.	Air Quality, Greenhouse Gas Emissions, Hydrology/Water Quality, Noise, Traffic/Transportation
4. JR Legacy II, LLC/Global Carte, LLC	LOCATION: Southwest corner of Montiel Road & Leora Lane. DESCRIPTION: 128 room hotel with pool, fitness center, meeting space, restaurant & 152 parking spaces STATUS: Application has been submitted and is under review.	Air Quality, Greenhouse Gas Emissions, Hydrology/Water Quality, Noise, Traffic/Transportation
5. North County Shooting Center, Inc.	LOCATION: 1440 Descanso Avenue. DESCRIPTION: Indoor gun range with retail. STATUS: Application has been submitted. Environmental document is out for review, 12/3/15 – 12/23/15.	Air Quality, Greenhouse Gas Emissions, Hydrology/Water Quality, Noise, Traffic/Transportation
6. Venturepoint Development	LOCATION: 1020-1080 West San Marcos Boulevard. DESCRIPTION: New 6,199-square-foot Buffalo Wild Wings restaurant building at Old California Restaurant Row. STATUS: Under construction.	Air Quality, Greenhouse Gas Emissions, Hydrology/Water Quality, Noise, Traffic/Transportation
7. Old Creek Ranch	LOCATION: San Elijo Road east of Rancho Santa Fe Road. DESCRIPTION: 416 total acres. 401 single-family homes, 1,123 multi-family, 10.3 acres light industrial, 181 acres open space STATUS: All residential products are completed. The last remaining development opportunity is light industrial on the north side of San Elijo Road adjacent to Carlsbad.	Air Quality, Greenhouse Gas Emissions, Hydrology/Water Quality, Noise, Traffic/Transportation
8. Richard Woolsey	LOCATION: Montiel Road (cul de sac, off of Palomar Drive) DESCRIPTION: Divide parcels into 3 single family lots STATUS: Application has been submitted and is under review.	Air Quality, Greenhouse Gas Emissions, Hydrology/Water Quality, Noise, Traffic/Transportation
9. Brookfield Residential Properties	LOCATION: Twin Oaks Valley Road, south of Craven (Hanson Rancho Coronado site). DESCRIPTION: 346 detached 2-story single family homes, public/private streets, public park & open space. STATUS: City Council approved the proposed project 12/8/15.	Aesthetics, Air Quality, Geology/Soils, Hazards/ Hazardous Materials, Biological Resources Hydrology/Water Quality, Noise, Traffic/Transportation
10. Murai-Sab, LLC (Colrich)	LOCATION: West side of the northerly terminus of Las Posas Road. DESCRIPTION: Proposed adoption of a new Specific Plan, Tentative Subdivision Map for an 89-unit single family residential subdivision, General Plan Amendment to deviate from the park acreage requirement, Grading Variance to allow for slopes higher than 20' and a CUP for rock crusher use during project grading. STATUS: Application under review and is deemed incomplete.	Aesthetics, Air Quality, Geology/Soils, Hazards/ Hazardous Materials, Biological Resources Hydrology/Water Quality, Noise, Traffic/Transportation
11. Urban Villages San Marcos, LLC "Mason Ale Works"	LOCATION: Redel Road. DESCRIPTION: Re-use existing building for URGE Restaurant/Brewery, approximately 21,000 square feet with a 5,000-square-foot outside area. STATUS: Application has been submitted. Building plans under review.	Air Quality, Greenhouse Gas Emissions, Hydrology/Water Quality, Noise, Traffic/Transportation

Project	Location/Description/Status	Potential Cumulative Issues of Relevance
12. Corner at 2 Oaks (Replaces Projects Marketplace at Twin Oaks," and "Civic Center Marketplace")	LOCATION: Southwest corner of Twin Oaks Valley Road and San Marcos Boulevard. DESCRIPTION: Phase 1 was approved for a Class "A" office building, retail, restaurant, and a 118 room hotel. STATUS: Building plans approved and issued for construction.	Air Quality, Greenhouse Gas Emissions, Hydrology/Water Quality, Noise, Traffic/Transportation
13. University District Specific Plan ("North City")	LOCATION: Generally bounded by State Route 78, Industrial Street, Barham Drive/Discovery Street and San Marcos Creek. DESCRIPTION: 2,600 multi-family residential units, 800 student housing units, hotel use (450 rooms), 652,000 square feet of general office, 300,000 square feet of medical office, 700,000 square feet of commercial/mixed-use, 30,000 square feet of civic/community use. STATUS: Construction of individual projects underway.	Aesthetics, Air Quality, Geology/Soils, Hazards/ Hazardous Materials, Biological Resources Hydrology/Water Quality, Noise, Traffic/Transportation
14. San Marcos Creek ("Creek District") Specific Plan	LOCATION: Generally between Discovery Street and San Marcos Boulevard. DESCRIPTION: Mixed-use development consisting of 1,265,000 square feet of retail, 589,000 square feet of office and 2,300 dwelling units. STATUS: Construction of individual projects underway.	Aesthetics, Air Quality, Geology/Soils, Hazards/ Hazardous Materials, Biological Resources Hydrology/Water Quality, Noise, Traffic/Transportation
15. San Elijo Hills	LOCATION: San Elijo Road, east of Rancho Santa Fe Road and the "Old Creek Ranch" Specific Plan. DESCRIPTION: 3,398 total dwelling units. STATUS: Construction of individual projects underway.	Aesthetics, Air Quality, Geology/Soils, Hazards/ Hazardous Materials, Biological Resources Hydrology/Water Quality, Noise, Traffic/Transportation
16. Pacific Commercial	LOCATION: Northeast corner of Grand Avenue and Pacific Street. DESCRIPTION: 31,776-square-foot commercial center on a 2.77-acre lot. STATUS: Application under review. Environmental document has been prepared.	Aesthetics, Air Quality, Geology/Soils, Hazards/ Hazardous Materials, Biological Resources Hydrology/Water Quality, Noise, Traffic/Transportation
17. Pacific Industrial No. 1	LOCATION: Pacific Street, north of Grand Avenue. DESCRIPTION: 22,160-square-foot industrial building. STATUS: Site is being graded.	Air Quality, Greenhouse Gas Emissions, Hydrology/Water Quality, Noise, Traffic/Transportation
18. San Marcos Highlands	LOCATION: Termination of Las Posas Road. DESCRIPTION: Proposed Specific Plan Amendment/Tentative Map for a 189-unit subdivision/Conditional Use Permit for rock crusher and Ridgeline Development Permit to review for those lots within the Ridgeline Overlay Zone. STATUS: Application under review. Environmental Impact Report has been prepared and released. Public Review period is 6/23/15 – 8/24/15.	Aesthetics, Air Quality, Geology/Soils, Hazards/ Hazardous Materials, Biological Resources Hydrology/Water Quality, Noise, Traffic/Transportation
19. Palomar Station	LOCATION: South of Mission Road, east of Las Posas Road, and north and south of Armorlite Drive. DESCRIPTION: Mixed-use development consisting of 370 condominiums, 44,000 square feet of commercial, 5,400 square feet live/work, 5,000 square feet of restaurant/food court uses, and 70,000 square feet of recreation space on 14.32 acres. STATUS: All residential permits issued. All residential phases are completed with final occupancies.	Air Quality, Noise, Traffic/Transportation
20. Davia Village ("MARC San Marcos")	LOCATION: 1001 Armorlite Drive, east of Palomar Station. DESCRIPTION: Mixed-Use Project - 4 stories, 416 residential apartments, commercial retail - 15,000 square feet. STATUS: Project includes a park per the 2012 General Plan Update. The City Council approved the project. Final project plans are being processed. Three of six buildings are under construction.	Air Quality, Greenhouse Gas Emissions, Hydrology/Water Quality, Noise, Traffic/Transportation

Project	Location/Description/Status	Potential Cumulative Issues of Relevance
21. Shane Park Plaza	LOCATION: 200-300 block of Rancho Santa Fe Road. DESCRIPTION: Neighborhood shopping center (6,138 square feet retail and 19 apartments). STATUS: Under construction.	Air Quality, Greenhouse Gas Emissions, Hydrology/Water Quality, Noise, Traffic/Transportation
22. UK Investments, LLC	LOCATION: 794-796 North Alda Drive. DESCRIPTION: 35-unit multi-family apartments. STATUS: Application under review.	Air Quality, Greenhouse Gas Emissions, Hydrology/Water Quality, Noise, Traffic/Transportation
23. "Mission 316" (Norman SM Project Owner, LLC)	LOCATION: 316 East Mission Road. DESCRIPTION: 92 for-sale condominiums STATUS: City Council approved project in December 2014. Grading is underway and building plans under review.	Air Quality, Greenhouse Gas Emissions, Hydrology/Water Quality, Noise, Traffic/Transportation
24. The Orlando Company (Vidler Estates)	LOCATION: 824 North Twin Oaks Valley Road DESCRIPTION: 19-lot subdivision STATUS: Public workshop held in December 2014. Planning Commission recommended approval to City Council on March 16, 2015 and City Council approved project on April 28, 2015.	Air Quality, Greenhouse Gas Emissions, Hydrology/Water Quality, Noise, Traffic/Transportation
25. San Marcos 13, LLC	LOCATION: South of Oleander Avenue and east of Poinsettia Avenue. DESCRIPTION: Subdivide 2.95 acres, two parcels, into 14 single-family lots. STATUS: Processing grading plans.	Air Quality, Greenhouse Gas Emissions, Hydrology/Water Quality, Noise
26. Hallmark Communities (Borden Road 22)	LOCATION: 1200 Block of Borden Road. DESCRIPTION: 22-unit detached single-family home subdivision STATUS: Tentative Subdivision Map approved. Final Map, Grading and Street Improvement Plans were submitted and are currently under review.	Air Quality, Greenhouse Gas Emissions, Hydrology/Water Quality, Noise, Traffic/Transportation
27. Heritage Ranch	LOCATION: Richland Road. DESCRIPTION: Subdivision consisting of 16 one-acre lots. STATUS: Tentative Subdivision Map approved; Need final map approval. A one-year tentative subdivision map extension was approved by the Planning Commission. State of California has issued automatic time extensions. Will expire June 2016.	Air Quality, Greenhouse Gas Emissions, Hydrology/Water Quality, Noise
28. Kachay Homes	LOCATION: Application has been submitted and is under review. DESCRIPTION: 8 single-family homes on one-acre lots STATUS: Needs final map approval. State of California has issued automatic time extension to the Tentative Subdivision Map. Map will expire April 2016.	Air Quality, Greenhouse Gas Emissions, Hydrology/Water Quality, Noise
29. City Ventures	LOCATION: 302 North Pacific Street. DESCRIPTION: Mixed-use, 74 residential townhomes and three live/work units. STATUS: Application has been submitted and is under review.	Air Quality, Greenhouse Gas Emissions, Hydrology/Water Quality, Noise, Traffic/Transportation
30. Villa Serena	LOCATION: 339 and 340 Marcos Street. DESCRIPTION: New, 3-story, 148 affordable apartments, a community center and associated single-story parking structures. STATUS: Application has been submitted and is under review.	Air Quality, Greenhouse Gas Emissions, Hydrology/Water Quality, Noise, Traffic/Transportation
31. Sandy Lanes Estates	LOCATION: Sandy Lane. DESCRIPTION: Subdivide vacant 8.19 acres into 9 residential lots. STATUS: Application has been submitted and is under review.	Air Quality, Greenhouse Gas Emissions, Hydrology/Water Quality, Noise
32. SJ Asset Management	LOCATION: Woodward Street, north of Borden Road. DESCRIPTION: 50-unit senior housing project. STATUS: Application has been submitted and is under review.	Air Quality, Greenhouse Gas Emissions, Hydrology/Water Quality, Noise, Traffic/Transportation

(1) Source: CSUSM 2016

(2) Source: City of San Marcos 2016, LLG Engineers 2016

The following cumulative impacts analysis is organized by each environmental topic discussed in Sections 5.1 through 5.17 above. A description of the area of influence for cumulative impacts with respect to each environmental topic is provided at the beginning of each topical discussion, followed by an analysis of the proposed project's potential cumulative effects. Cumulative impacts to resources for which the proposed project was determined to have "No Impact" are not included in the cumulative analysis because no incremental effect would occur as a result of the proposed project. Therefore, Agricultural and Forestry Resources, Biological Resources, and Land Use and Planning, Mineral Resources, Population and Housing, and Recreation are not discussed any further in this section.

Aesthetics

The area of projects that would be considered for the cumulative analysis of aesthetics is defined as the viewshed of the proposed project. Thus, cumulative projects would be limited to development on the CSUSM campus and the immediate campus vicinity that could potentially obstruct or alter the viewshed, which include the proposed CSUSM Physical Master Plan Update. The Physical Master Plan proposes substantial new development on campus. Although the development proposed by this project is consistent with existing land uses, cumulative development would have the potential to obstruct views of scenic vistas to and from campus, alter the visual character of the area, and/or create new sources of substantial light and glare. Thus, there would be a potentially significant cumulative impact to aesthetics. However, the new EL Building would be located in a developed area of the campus and would be a similar height to existing on campus structures, including Craven Hall and Science Hall I to the northwest and Academic Hall and Markstein Hall to the north. The proposed project would not result in the obstruction of views of scenic vistas on or off campus. Therefore, the proposed project would not obstruct views of scenic vistas on or off campus. In addition, the proposed project would be designed to be consistent with existing surrounding uses and the applicable CSUSM design standards. Furthermore, with implementation of the mitigation measure Aes-1, a lighting plan outlining design measures to minimize lighting impacts of the proposed project would be prepared, reviewed, and approved by CSUSM Planning, Design and Construction staff prior to the start of construction to ensure that the proposed lighting would not adversely affect nighttime views in the area. Therefore, the proposed project would not result in a cumulatively considerable contribution to the significant cumulative impact to aesthetics.

Air Quality

Refer to discussion in Section 6.3(c) above for an analysis of cumulative air quality impacts. As discussed in this section, although the project area is in basic non-attainment of the NAAQS for ozone and in non-attainment of the state AAQS for ozone, PM_{10}, and $PM_{2.5}$, the construction and operational emissions from the proposed project in combination with other cumulative projects would not result in a cumulatively considerable contribution to the significant cumulative impact to air quality.

Cultural Resources

The area of projects that would be considered for the cumulative analysis of cultural resources is defined as the CSUSM campus and surrounding City of San Marcos. If known cultural resources are identified on any of the cumulative project sites, those individual cumulative projects would be required to mitigate potentially significant impacts in accordance with CEQA. Because several cumulative projects are proposed in previously undeveloped areas, the discovery of unknown buried cultural resources would be a possibility. Due to the scarcity and sensitivity of such resources, there would be a potentially significant cumulative impact to cultural resources associated with these cumulative projects. However, since no known cultural resources occur on or in the vicinity of the project site, the proposed project would result in no impacts to known cultural resources. Furthermore, due to the high level of ground disturbance at

the project site, which was previously graded, the potential for unknown buried cultural resources to occur is low. Therefore, the proposed project would not result in a cumulatively considerable contribution to the significant cumulative impact to cultural resources.

Geology and Soils

The geographic context for the cumulative analysis of geology and soils is generally site-specific, rather than cumulative, in nature because each site has unique geologic considerations that would be subject to uniform site development and construction standards. In this way, potential cumulative impacts resulting from seismic and geologic hazards would be minimized on a site-by-site basis to the extent that modern construction methods and code requirements provide. The structural design for all cumulative projects would be required to comply with all applicable public health, safety, and building design codes and regulations to reduce seismic and geologic hazards to an acceptable level. In addition, individual projects would be required to mitigate potentially significant impacts to geology and soils to the extent feasible, similar to the proposed project. Thus, because compliance with all applicable codes and regulations would be required for all cumulative projects, a significant cumulative impact associated with geology and soils would not occur. Therefore, an analysis of the proposed project's incremental contribution to a significant cumulative impact is not required.

Greenhouse Gas Emissions

Individual projects of any size are generally of insufficient magnitude by themselves to influence climate change or result in a substantial contribution to the global GHG inventory. Thus, GHG impacts are recognized as exclusively cumulative impacts; there are no non-cumulative GHG emissions impacts from a climate change perspective (CAPCOA 2008). Accordingly, the discussion of the proposed project's GHG emissions in Section 6.7(a) above under construction and operation addresses the project's cumulative impacts related to GHG emissions. The proposed project would not result in a cumulatively considerable contribution to the significant cumulative impact associated with GHG emissions.

Hazards and Hazardous Materials

The area of projects that would be considered for the cumulative analysis of hazards and hazardous materials is defined as the immediate vicinity of the proposed project site. For the most part, hazards and hazardous materials impacts, such as those associated with the handling of hazardous materials, are site-specific and would not combine with impacts from other projects to result in cumulative impacts, with the exception of wildland fire risk and campus emergency access. The CSUSM Physical Master Plan project proposes substantial new development on the CSUSM campus, which would have the potential to increase the exposure of people and structures on campus to risks associated with wildland fires. Thus, there would be a potentially significant cumulative impact associated with hazards and hazardous materials. However, all campus development plans are reviewed by the State Fire Marshal to ensure compliance with the California Fire Code, including the installation of fire sprinklers, fire alarms, fire retardant construction materials, and other types of built-in fire protection measures, minimizing risks to people and structures in the event of a wildland fire. Furthermore, CSUSM would adhere to fire clearance standards which prohibit the accumulation of unnecessary weeds, grass, and vegetation around buildings and structures in order to prevent fire hazards associated with overgrowth. Implementation of mitigation measure Haz-1 would maintain adequate campus emergency access during construction of the project. Therefore, the proposed project would not result in a cumulatively considerable contribution to the significant cumulative impact associated with wildland fires.

Hydrology and Water Quality

The geographic context for the cumulative analysis of hydrology and water quality encompasses the San Marcos Creek watershed, within which the proposed project and CSUSM campus are located.

Water Quality. Pollutants generated by urban land uses have the potential to degrade the surface water quality of receiving waters. Development projects in the City of San Marcos are subject to the standards of the City's SUSMP and NPDES permit regulations, which require that source control and nonpoint source BMPs be employed to control potential effects on water quality and that stormwater quality control devices be incorporated into project design to collect sediment and other pollutants. In order to obtain project approval, all cumulative projects under the jurisdiction of the City of San Marcos would be required comply with the applicable mandated measures to control pollution. Although development projects on the CSUSM campus are not required to comply with the City's SUSMP, cumulative projects on campus would comply with the CSUSM SWMP (Atkins 2012), which identifies post-construction design standards and BMPs for facilities operation and maintenance to mitigate impacts to downstream water quality due to pollutants associated with operational activities on campus. Furthermore, implementation of mitigation measure Hyd-1 will update the CSUSM SWMP to be consistent with the county-wide SUSMP, which would provide water quality protection to the same standards as other developments within the region. Thus, cumulative project compliance with the City's SUSMP or CSUSM SWMP, and NPDES permits, would maintain water quality in accordance with RWQCB standards, and a significant cumulative impact to water quality would not occur. Therefore, an analysis of the proposed project's incremental contribution to a significant cumulative impact is not required.

Hydrology. Several cumulative projects within the City of San Marcos are proposed in previously undeveloped areas. These developments would have the potential to increase impervious surfaces and substantially alter the existing drainage patterns on and surrounding their project sites. Thus, there would be a potentially significant cumulative impact to hydrology. However, due to compliance with the NPDES Construction General Permit, construction-related impacts associated with temporary drainage alterations would be less than significant. Therefore, the proposed project would not result in a cumulatively considerable contribution to the significant cumulative impact to hydrology.

Noise

Noise, by definition, is a localized phenomenon and is progressively reduced as the distance from the source increases. Generally, noise levels decrease by approximately 6 dB for every doubling of distance from the source. Therefore, the area of projects that would be considered for the cumulative analysis of noise is defined as the immediate vicinity of the proposed project, which would only include cumulative projects on the CSUSM campus. At this time, there are no planned projects on campus that would overlap with construction of the proposed project. Thus, these cumulative projects would not contribute to a significant cumulative impact associated with construction-related noise. Furthermore, implementation of mitigation measure Noi-1 would reduce the construction-related noise impacts of the proposed project to a less than significant level.

Cumulative projects on campus would generate operational noise associated with normal building usage activities such as human conversation, opening and closing of doors and windows, and HVAC equipment. Since the campus is already highly developed with buildings of similar size and associated collegiate uses, operational noise associated with cumulative development projects would not cause a substantial increase in ambient noise levels. Thus, a significant cumulative impact associated with operational noise would not occur.

As shown in Table 10, implementation of cumulative projects would result in 1 to 2 dBA CNEL increases in noise level by Year 2020 on roadways serving the project site. However, the proposed project would not result in any discernable increase in noise level on any study area roadway segment. Therefore, the proposed project would not result in a cumulatively considerable contribution to future increases in traffic noise.

Public Services

The area of projects that would be considered for the cumulative analysis of public services is defined as the CSUSM campus and surrounding City of San Marcos. Future development in the City of San Marcos would increase the number of buildings that would require service by the San Marcos fire and police departments. In addition, cumulative projects where new residential development is proposed would increase the population of the City of San Marcos and increase the demand for schools and other public services. Thus, there would be a potentially significant cumulative impact to public services. However, the proposed project would not substantially increase the demand for fire or police protection services or expand their existing on-campus service areas. In addition, the proposed project would not induce growth on campus or in the City of San Marcos, so it would not increase the demand for schools, parks, or other public facilities. Therefore, the proposed project would not result in a cumulatively considerable contribution to the significant cumulative impacts to public services.

Transportation/Traffic

The area of projects that would be considered for the cumulative analysis of transportation/traffic is defined as the CSUSM campus and surrounding City of San Marcos. Construction of several cumulative projects could occur simultaneously with construction of the proposed project. Heavy truck trips and construction worker vehicle trips generated by the cumulative projects have the potential to utilize the same routes simultaneously. Thus, there would be a potentially significant cumulative impact associated with construction-related traffic. However, construction of the proposed project would require minimal construction worker trips and heavy truck trips per day during the construction phase. Furthermore, heavy truck trips would be spread throughout the day and would only travel via City streets for the short distance (approximately 0.6 miles) between SR-78 and the campus. Therefore, the proposed project would not result in a cumulatively considerable contribution to the significant cumulative impact associated with construction-related traffic.

Cumulative projects would generate new vehicle trips in the City of San Marcos that would have the potential to exceed the current capacity of the City's circulation system. For example, the proposed CSUSM Physical Master Plan is a large project that would result in new vehicle trips on the streets surrounding the CSUSM campus. Thus, a potentially significant cumulative impact associated with operational traffic would occur. However, as discussed under Section 6.16(a), the proposed project would not exceed the significance criteria for impacts to roadways segments and intersections under the 2020 year with project scenario and would not cause an intersection to operate at a LOS E or worse. Therefore, the proposed project would not result in a cumulatively considerable contribution to the significant cumulative impact associated with operational traffic.

Utilities and Service Systems

The geographic context for the cumulative analysis of utilities and service systems encompasses the service area of each specific utility district. The increased use of public utilities associated with cumulative projects would add to the incremental demand for these utilities. If the cumulative projects exceed the growth projections that were utilized by the public utility districts to plan for the capacity of their systems, the public utilities providers may not have adequate infrastructure or funding in place to serve the

cumulative projects. Thus, there would be a potentially significant impact to public utilities and service systems. However, the proposed project is consistent with the 1988 Master Plan for the CSUSM campus, which includes the expansion of EL services on campus. Since all of the public utility providers have updated their master plans since 1988, these planning documents have accounted for the campus growth proposed in the adopted 1988 Master Plan. Thus, the proposed project would not exceed the capacity of the public utility districts that serve the campus. Therefore, the proposed project would not result in a cumulatively considerable contribution to the significant cumulative impact to public utilities and service systems.

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

Less Than Significant Impact with Mitigation Incorporated

The proposed project would not result in environmental effects which would cause substantial adverse effects on human beings, either directly or indirectly, because all potential impacts would either be less than significant or reduced to a less than significant level with implementation of mitigation measures, as discussed in Sections 6.1 through 6.17 above. These mitigation measures are summarized in the Mitigation Monitoring and Reporting Program provided in Chapter 7.0.

7.0 Mitigation Monitoring and Reporting Program

Mitigation Measure	Time Frame of Mitigation				Monitoring Reporting Agency	Time Frame for Verification Frequency to		Date of	
	Planning	Pre Constr.	During Constr.	Post Constr.		Monitor	Report	Completion	Verification
Aesthetics									
Aes-1 Prior to completion of working drawings, a lighting plan outlining design measures to minimize lighting impacts of the proposed project will be prepared, reviewed, and approved by CSUSM Planning, Design and Construction. Standards design measures will include shielding all direct lighting from residential areas, sensitive biological habitat, and other light sensitive receptors; directing lighting to the specific location intended for illumination, such as walkways; minimizing non-essential and stray light spillover; using low intensity lamps, except when high intensity illumination is required for safety purposes; and, as feasible, complying with the intent of Lighting Standards in Section 20.47.060 of the San Marcos Municipal Code to minimize light pollution impacts to Mount Palomar Observatory.		✓		✓	CSUSM				
Geology and Soils									
Geo-1 For any excavations within the project site where groundwater seepage has the potential to occur, shallow subdrains shall be installed in these locations to collect and convey the water to a suitable outlet. Subdrains shall be designed similar to previous subdrain designs on the CSUSM campus, and shall be installed either prior to or during construction of the proposed project.		✓	✓		CSUSM				
Hazards and Hazardous Materials									
Haz-1 For any temporary lane closure required during project construction, the construction contractor and/or the CSUSM Planning, Design and Construction staff shall notify the CSUSM University Police of the location and timing of the closure prior to the start of construction. If determined necessary by the CSUSM University Police, local emergency services, including the San Marcos Fire Department and appropriate ambulance services, shall also be notified.		✓			CSUSM				

Mitigation Measure	Time Frame of Mitigation				Monitoring Reporting Agency	Time Frame for Verification Frequency to		Date of	
	Planning	Pre Constr.	During Constr.	Post Constr.		Monitor	Report	Completion	Verification
Hydrology and Water Quality									
Hyd-2 Prior to occupancy of the proposed EL Building, a registered engineer shall perform a drainage study for the proposed project commissioned by the CSUSM Planning, Design and Construction or Facility Services departments that complies with the following conditions: i. Site design that controls runoff discharge volumes and durations shall be utilized where applicable. ii. Measures that protect slopes and channels such as energy dissipaters, vegetation, and slope/channel stabilizers shall be applied where appropriate. iii. The development shall maintain the peak runoff for the 10-year and 6-hour storm event. If determined necessary by the registered engineer, in coordination with CSUSM, maintenance of peak runoff for a larger storm may be required. Design measures shall be consistent with the 1988 Master Plan (CRSS Architecture Group) and 2012 SWMP (Atkins), in operation prior to occupancy of the new gymnasium, and regularly maintained by CSUSM. In addition, the proposed project shall comply with the provisions of California Government Code 54999 related to funding for capital improvements.	✓	✓	✓	✓	CSUSM				
Noise									
Noi-1 The construction contractor shall implement the following measures during construction to minimize temporary increases in ambient noise levels caused by construction activities and equipment. Measures to reduce construction-related noise shall include, but not be limited to, the following: i. Properly outfit and maintain construction equipment with manufacturer-recommended noise-reduction devices. ii. Operate all diesel equipment with closed engine doors and equip with factory-recommended mufflers. iii. Use electrical power to operate air compressors and similar power tools. iv. Employ additional noise attenuation techniques, as needed, to reduce excessive noise levels. Such techniques shall include, but not be limited to, the construction of temporary sound barriers or sound blankets between the project site and nearby noise-sensitive receptors. v. Post a sign on campus informing all workers and subcontractors of the time restrictions for construction activities. The sign should also include the CSUSM telephone numbers where complaints associated with construction-related noise can be submitted.			✓		CSUSM				

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9.0 Report Preparers

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Appendix A
Air Quality and Greenhouse Gas Technical Report

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March 22, 2016

Steve Ramirez
Interim Director, Planning Design and Construction
California State University San Marcos
333 Twin Oaks Valley Road
San Marcos, California 92096

Subject: **Air Quality and Greenhouse Gas Emissions Analysis**
California State University San Marcos Extended Learning Building Project
California State University San Marcos, San Diego County, California

Dear Mr. Ramirez:

This letter report provides an air quality and greenhouse gas (GHG) emissions analysis for the California State University San Marcos (CSUSM) Extended Learning (EL) Building Project (project). This report is prepared in compliance with the California Environmental Quality Act (CEQA), San Diego Air Pollution Control District (SDAPCD)'s guidance, and San Diego County's guidance.

PROJECT DESCRIPTION

The proposed CSUSM EL Building project site is located in the southeastern portion of the CSUSM campus, east of Palm Canyon Drive, north of Parking Lots E and F, south of Parking Lot H. The proposed project would construct a building directly adjacent to the existing Foundation Classroom Building (FCB). The project site is approximately 20,000 square feet in size and is currently undeveloped, but has been previously graded.

The proposed project would construct a new EL Building to expand the EL Department, provide new instructional space for EL program courses, as well as co-locate other EL units. The proposed project would alleviate crowding of state funded classroom and lab spaces that are currently impacted by use for EL courses. Therefore, in addition to allowing the expansion of the EL Department, the proposed project would improve the campus utilization of state funded spaces.

The proposed project would have a footprint of approximately 20,000 square feet (SF), include approximately 52,300 SF of useable space, and be three-stories (55 feet) in height. The new structure is planned to include offices, meeting/conference rooms, classrooms and lecture halls, computer labs, science labs, research space, and lab storage rooms.

The proposed building's exterior design would be consistent with the existing materials, scale, and mass of surrounding campus buildings, including the adjacent FCB. In the near-term, the project would serve the existing campus by relocating existing projects. In the long-term (3-5 years), the proposed project would expand the EL Department and is anticipated to serve up to approximately 1,655 full-time equivalent students (FTES) by 2020/2021, which includes 428 new FTES.

Construction of the proposed project would take approximately 18 months, with construction beginning in the summer of 2017 and completed in the spring 2019. Construction would consist of site preparation and relocation of utilities (2 months), grading of the site (2 months), construction of the proposed EL Building (12 months), and architectural coating (2 months). The site was previously graded and any additional earthwork for the proposed project would be balanced on site. No excavated material would be transported off site. Standard construction equipment would be required for project construction, including, but not limited to, backhoes, excavators, and loaders. It is anticipated that a daily average of 20 construction workers would be required on site. Access to the project site by construction equipment would be from Palm Canyon Drive, south of Craven Road. The construction staging area would be located within the surrounding parking lot. Construction hours would be limited to 7:00 a.m. to 4:00 p.m. Monday through Friday.

REGULATORY SETTING

Criteria Air Pollutants

Air pollutants are regulated at the national, state, and air basin level; each agency has a different level of regulatory responsibility. The U.S. Environmental Protection Agency (EPA) regulates at the national level. The California Air Resources Board (ARB) regulates at the state level. The SDAPCD regulates at the air basin level. The project is located within the San Diego Air Basin (SDAB).

The Clean Air Act (CAA) of 1970 required the U.S. EPA to establish National Ambient Air Quality Standards (NAAQS), also known as federal standards. There are federal standards for the following six air pollutants, which were identified from provisions of the Clean Air Act of 1970: ozone, nitrogen dioxide (NO_2), lead, particulate matter (PM_{10} and $PM_{2.5}$), carbon monoxide (CO), and sulfur dioxide (SO_2).

The six air pollutants identified above are also known as 'criteria pollutants'. The federal standards were set to protect public health, including that of sensitive individuals; thus, the standards continue to change as more medical research is available regarding the health effects of the criteria pollutants.

States retain the option to adopt more stringent standards or to include other specific pollutants. The 1990 CAA Amendments require that each state have an air pollution control plan called the State Implementation Plan (SIP). The SIP includes strategies and control measures to attain the NAAQS by deadlines established by the CAA. The CAA Amendments dictate that states containing areas violating the NAAQS revise their SIPs to include extra control measures to reduce air pollution. The EPA reviews the SIPs to determine whether the plans would conform to the 1990 CAA Amendments and achieve the air quality goals.

The EPA has designates air basins (or portions thereof) as being in "attainment," "nonattainment," or "unclassified" for each criteria air pollutant, based on whether or not the NAAQS have been achieved. If an area is designated unclassified, it is because inadequate air quality data were available as a basis for a nonattainment or attainment designation. The EPA classifies the SDAB as in attainment for CO, NO_2, SO_2, lead, PM_{10}, and $PM_{2.5}$ with respect to federal air quality standards. The SDAB is currently in basic nonattainment for the federal 8-hour ozone standard. The *Eight Hour Ozone Attainment Plan for San Diego County* was prepared by the SDAPCD in 2007, which identifies control measures to reduce emissions of ozone precursors and complies with federal SIP requirements.

The state of California has established standards for criteria pollutants that are generally stricter than federal standards. The ARB administers the California Ambient Air Quality Standards (CAAQS) for the 10 air pollutants designated in the California Clean Air Act. The 10 state air pollutants are the six federal standards listed above, as well as visibility-reducing particulates, hydrogen sulfide, sulfates, and vinyl chloride. The SDAB is currently in nonattainment status for the ozone, PM_{10} and $PM_{2.5}$ CAAQS.

Greenhouse Gas Emissions

Assembly Bill 32, the California Global Warming Solutions Act of 2006

AB 32, the California Global Warming Solutions Act of 2006, requires California to reduce statewide GHG emissions to 1990 levels by 2020. AB 32 directs the ARB to develop and implement regulations that reduce statewide GHG emissions. The Climate Change Scoping Plan (Scoping Plan) was approved by ARB in December 2008, and it outlines the state's plan to achieve the GHG reductions required in AB 32. The Scoping Plan contains the primary strategies California will implement to achieve a reduction of 169 million metric tons of carbon dioxide equivalent (MT CO_2e), or reduce the state's projected 2020 emission levels by approximately 28 percent.

In the Scoping Plan, ARB encourages local governments to adopt a reduction goal for municipal operations emissions and move toward establishing similar goals for community emissions that parallel the state commitment to reduce GHGs. Although the specific role local governments will play in meeting the state's AB 32 goals is still being defined, they will nonetheless be key players in implementing GHG reduction strategies. The first adopted version of ARB's Scoping Plan recommended that local governments achieve a 15-percent reduction below 2005 levels by 2020, which aligns with the state's goal of not exceeding 1990 emissions levels by 2020. However, the First Update to the Climate Change Scoping Plan (2013 Update) does not contain a recommended reduction level or percent for local government's municipal operations. The ARB is moving forward with a second update to the Scoping Plan.

Executive Order S-3-05

California Governor Arnold Schwarzenegger announced on June 1, 2005, through Executive Order S-3-05, the following GHG emission reduction targets:

- By 2010, reduce GHG emissions to 2000 levels
- By 2020, reduce GHG emissions to 1990 levels
- By 2050, reduce GHG emissions to 80 percent below 1990 levels

The first California Climate Action Team (CCAT) Report to the Governor in 2006 contained recommendations and strategies to help ensure the targets in Executive Order S-3-05 are met. The latest CCAT Biennial Report was released in December 2010.

Executive Order B-30-15

On April 29, 2015, California Governor Jerry Brown announced Executive Order B-30-15, which contains the following GHG emissions target:

- By 2030, California shall reduce GHG emissions to 40 percent below 1990 levels

The emission reduction target of 40 percent below 1990 levels by 2030 is an interim-year goal to provide substantial progress toward the ultimate goal of reducing emissions by 80 percent below 1990 levels by 2050.

AIR AND GREENHOUSE GAS POLLUTANT DESCRIPTIONS

Criteria Air Pollutants

Presented below is a description of each of the criteria air pollutants and their known health effects. This section only provides descriptions for criteria air pollutants with the potential to be emitted by the proposed project.

Carbon Monoxide is an odorless, colorless, and toxic gas. Exposure can result in headaches, dizziness, disorientation, nausea, fatigue, or death. The major sources of carbon monoxide in the SDAB are on-road vehicles, aircraft, and off-road vehicles and equipment.

Sulfur Dioxide is a colorless, pungent gas. Long-term exposure to high levels of SO_2 can cause irritation of existing cardiovascular disease, respiratory illness, and changes in the defenses in the lungs. When people with asthma are exposed to high levels of SO_2 for short periods of time during moderate activity, effects may include wheezing, chest tightness, or shortness of breath.

Particulate Matter consists of finely divided solids or liquids such as soot, dust, aerosols, fumes, and mists. Course particulate matter (PM_{10}) include that portion of the particulate matter with an aerodynamic diameter of 10 microns or less. Fine particulate matter ($PM_{2.5}$) has an aerodynamic diameter of 2.5 microns or less. Particulate discharge into the atmosphere results primarily from industrial, agricultural, construction, and transportation activities. Both PM_{10} and $PM_{2.5}$ may adversely affect the human respiratory system, especially in those people who are naturally sensitive or susceptible to breathing problems.

Ozone is formed when ozone precursor pollutants volatile organic compounds (VOC) and oxides of nitrogen (NO_X) react with sunlight. Along with ozone, VOC emissions are also transformed into organic aerosols in the atmosphere, which contribute to higher PM_{10} levels and lower visibility. Higher concentrations of VOC are suspected to cause eye, nose, and throat irritation; headaches; loss of coordination; nausea; and damage to the liver, kidneys, and central nervous system (EPA 1999). NO_X acts as an acute respiratory irritant and increases susceptibility to respiratory pathogens.

Lead is also a criteria pollutant. However, the proposed project does not include any components that would result in emissions of lead, such as industrial processes; therefore, lead is not discussed in this analysis.

Greenhouse Gases

Climate change refers to any substantial change in measures of climate (such as temperature, precipitation, or wind) lasting for decades or longer. GHGs are gases that trap heat in the atmosphere, analogous to the way a greenhouse retains heat. The accumulation of GHGs in the atmosphere regulates the earth's temperature. Without the natural heat-trapping effects of GHGs, the earth's temperature would be about 34 degrees Celsius cooler (California Climate Action Team [CCAT] 2007). California Health and Safety Code Section 38505(g) defines GHGs to include the following compounds: carbon dioxide

(CO_2), methane (CH_4), nitrous oxide (N_2O), chlorofluorocarbons (CFCs), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6).

CO_2 enters the atmosphere through the burning of fossil fuels, solid waste, trees and wood products, and as a result of other chemical reactions such as through the manufacturing of cement. Globally, the largest source of CO_2 emissions is the combustion of fossil fuels in power plants, automobiles, industrial facilities, and other similar sources (EPA 2013). CH_4 is emitted from a variety of both natural and human-related sources, including fossil fuel production, animal husbandry, rice cultivation, biomass burning, and waste management (EPA 2011). N_2O is emitted during agricultural and industrial activities, as well as during combustion of fossil fuels and solid waste (EPA 2010). HFCs, PFCs, and SF_6 are synthetic, powerful GHGs that are emitted from a variety of industrial processes, and the production of chlorodifluoromethane (HCFC-22). The proposed project would not include any industrial processes and HCFC-22 has been mostly phased out of use in the U.S. under the Montreal Protocol (UNEP 2012); therefore, HFCs, PFCs, and SF_6 are not included in this analysis.

Individual GHGs have varying heat-trapping properties and atmospheric lifetimes. Each GHG is compared to CO_2 with respect to its ability to trap infrared radiation, its atmospheric lifetime, and its chemical structure. The CO_2 equivalent (CO_2e) is a consistent methodology for comparing GHG emissions since it normalizes various GHG emissions to a consistent measure. For example, CH_4 is a GHG that is 21 times more potent than CO_2; therefore, one metric ton of CH_4 is equal to 21 metric tons (MT) CO_2e. Table 1 identifies the CO_2e and atmospheric lifetimes of basic GHGs.

Table 1 Carbon Dioxide Equivalents and Atmospheric Lifetimes of Basic GHGs

GHG	Formula	Carbon Dioxide Equivalent (CO_2e)	Atmospheric lifetime (years)
Carbon dioxide	CO_2	1	50-200
Methane	CH_4	21	12
Nitrous oxide	N_2O	310	120

Source: EPA 2013

STANDARDS OF SIGNIFICANCE

Criteria Air Pollutants

The SDAPCD does not provide quantitative thresholds for determining the significance of construction or mobile source-related projects. However, the SDAPCD does specify Air Quality Impact Analysis (AQIA) trigger levels for new or modified stationary sources (SDAPCD Rules 20.2 and 20.3) If these incremental levels are exceeded, an AQIA must be performed. Although these trigger levels do not generally apply to general land development projects, for comparative purposes these levels may be used to evaluate the increased emissions from these projects. The screening level thresholds can be used to demonstrate that a project's total emissions would not result in a significant impact to regional air quality. Because the AQIA screening thresholds do not include VOC, the screening level for VOC used in this analysis are from the South Coast Air Quality Management District (SCAQMD), which generally has stricter emissions thresholds than SDAPCD. For $PM_{2.5}$, the EPA "Proposed Rule to Implement the Fine Particle National Ambient Air Quality Standards" published in 2005, which quantifies significant emissions as 10 tons per year, will be used as the screening level threshold. The trigger thresholds listed in Table 2 below are used

in this analysis to determine whether the project has the potential to violate regional air quality standards or result in a cumulatively considerable increase of criteria pollutant for which the project area is designated nonattainment.

Table 2 SDAPCD Air Pollutant Thresholds

Pollutant	Pounds Per Hour	Pounds Per Day	Tons Per Year
Carbon monoxide (CO)	100	550	100
Nitrogen Oxides (NO_x	25	250	40
Respirable Particulate Matter (PM_{10}	--	100	15
Fine Particulate Matter ($PM_{2.5}$)	--	55[(1)]	10[(1)]
Oxides of Sulfur (SO_x)	25	250	40
Lead (Pb)	--	3.2	0.6
Volatile Organic Compounds (VOC)	--	75[(2)]	13.7[(2)]

(1) EPA "Proposed Rule to Implement the Fine Particle National Ambient Air Quality Standards" published September 2005.
(2) Based on VOC threshold from SCAQMD.
Source: SDAPCD Rule 1501, 20.2 (d)(2), Table 20.2-1.

Greenhouse Gas Emissions

The CEQA Guidelines do not identify a quantitative threshold of significance for GHG emissions. Instead, the Guidelines leave the determination of the significance of GHG emissions up to the lead agency and authorize the lead agency to consider thresholds of significance previously adopted or recommended by other public agencies or recommended by experts (CEQA Guidelines §§ 15064.4(a), 15064.7(c).)

Specifically, CEQA Guidelines § 15064.7(c) states, "[w]hen adopting thresholds of significance, a lead agency may consider thresholds of significance previously adopted or recommended by other public agencies or recommended by experts, provided the decision of the lead agency to adopt such thresholds is supported by substantial evidence."

There are no quantitative GHG thresholds of significance adopted by the State, CSU, or SDAPCD. Therefore, this document uses the threshold of significance adopted by the County of San Diego in June 2012 to determine whether the GHG emissions from the proposed project may have a significant impact on the environment. The County's Guidelines for Determining Significance for Climate Change are based on regional data and therefore may be used by lead agencies in the region other than the County of San Diego. The purpose of the guidelines is to ensure that new development in San Diego County achieves its fair share of emissions reductions needed to meet the statewide AB 32 mandate.

The County's guidelines establish a screening level threshold of 2,500 MT CO_2e per year. This screening level applies separately to both construction and operation. Projects that would emit less than 2,500 MT CO_2e per year are considered to have insignificant emissions and would not affect the region's ability to meet reduction goals. Therefore, projects that result in emissions that are below this screening level threshold would not result in significant GHG emissions and no further analysis is required.

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CONSTRUCTION IMPACTS

Construction activities would result in temporary increases in air pollutant emissions. These emissions would be generated primarily from construction equipment exhaust, earth disturbance, construction worker vehicle trips, and heavy duty truck trips. Air pollutant and GHG emissions were estimated using the proposed project activity data and the emission factors included in the CalEEMod model (Version 2013.2.2), which takes into account the hours of operation, load factor and the emission factors for each piece of equipment. For detailed model assumptions and output, please see Attachment A.

Refer to the project description for a discussion of construction assumptions. CalEEMod defaults were assumed for construction vehicles, trips for material delivery, hours of operation for individual pieces of construction equipment, and construction equipment specifications.

Criteria Air Pollutants

The criteria air pollutant emissions from construction of the project are summarized in Table 3. As shown in Table 3, construction emissions would not exceed the significance thresholds during any individual construction phase. All construction emissions are below the recommended federal and regional significance thresholds. The estimated construction-generated air pollutants are substantially less than the thresholds of significance. Therefore, the proposed project would not result in a significant regional air quality impact during construction phases.

Table 3 Estimated Construction Maximum Air Pollutant Emissions

Phase	Maximum Daily Emissions (pounds/day)					
	VOC	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
Site Preparation	1	13	7	<1	1	1
Grading	1	11	9	<1	2	1
Building Construction	1	12	9	<1	1	1
Architectural Coating	28	2	2	<1	<1	<1
SDAPCD Threshold	**75**	**250**	**550**	**250**	**100**	**55**
Impact?	No	No	No	No	No	No

Source: CalEEMod Version 2013.2.2. See Attachment A for model output.

Greenhouse Gas Emissions

The GHG emissions that would result from project construction are summarized in Table 4. Construction of the new EL building would result in total GHG emissions of 231 MT CO_2e over 18 months. Annual GHG emissions would not exceed the 2,500 MT CO_2e threshold during construction. Therefore, a significant GHG emissions impact would not occur during construction.

Table 4 Estimated Construction GHG Emissions

Construction Phase	GHG Emissions (MT CO_2e)
Site Preparation	20
Grading	25
Building Construction	180
Architectural Coating	6
Total	**231**
County GHG Threshold	**2,500**
Impact?	No

Source: CalEEMod Version 2013.2.2. See Attachment A for model output.

OPERATION IMPACTS

Criteria Air Pollutants

Once constructed, the proposed building would not include any new stationary sources of criteria pollutants. However, the project would generate new vehicular trips to the new building. New vehicular trips would emit criteria pollutants. The traffic impact analysis prepared for the project by Linscott, Law and Greenspan (2016) determined that proposed project would generate 1,716 average daily trips and is expected to serve approximately 428 additional FTES for credited programs (1655 total FTES) at opening day. The default CalEEMod trip length for university or college land use is assumed.

Additionally, the project would result in emissions from area sources, including fuel combustion emissions from space and water heating; fuel combustion emissions from landscape maintenance equipment; and VOC emissions from periodic repainting of interior and exterior surfaces. Maximum daily operational criteria pollutant emissions are summarized in Table 5. As shown in Table 5, operational emissions would be below the significance thresholds.

Table 5 Estimated Operational Maximum Air Pollutant Emissions

Sector	Daily Emissions (pounds/day)					
	VOC	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
Area Sources (Consumer products, architectural coating, and landscape equipment)	1	<1	<1	0	<1	<1
Energy Use	<1	<1	<1	<1	<1	<1
On-road Vehicles	5	11	50	<1	9	3
Maximum Daily Emissions	***7***	***11***	***51***	***<1***	***9***	***3***
SDAPCD Threshold	**75**	**250**	**550**	**250**	**100**	**55**
Is there a Significant Impact?	No	No	No	No	No	No

Source: CalEEMod Version 2013.2.2. See Attachment A for model output.

Greenhouse Gas Emissions

As discussed above, the proposed project would generate new vehicle trips to the new building. Additionally, the project would result in an increase in solid waste generation and increase the campus water and energy demand. The project's increase in solid waste, water, and energy demand is estimated

using CalEEMod defaults for a university or college land use. The analysis assumes implementation of standard campus sustainability practices, including exceeding Title 24 energy standards by 26 percent, use of water efficient landscape irrigation and appliances, mandatory water use reductions (30 percent), and diversion of 75 percent of waste from landfills. CalEEMod estimates that the proposed project would result in an annual demand for 1,539,680 thousand British thermal units (kBTU) of natural gas, 476,714 kilowatt hours (kWh) of electricity, 0.6 million gallons of potable water, and 20 tons of solid waste disposal.

Table 6 summarizes annual GHG emissions from operation of the new extended learning building. On-road vehicles make up the largest percentage of total GHG emissions (87 percent), followed by electricity (8 percent), natural gas (4 percent), solid waste and water use (less than 1 percent each). Landscaping contributes a negligible amount of GHG emissions. Annual GHG emissions would not exceed the 2,500 MT CO_2e threshold during operation. Therefore, a significant GHG emissions impact would not occur.

Table 6 Estimated Operational GHG Emissions

Sector	GHG Emissions (MT CO_2e)	Percent of Total GHG Emissions
On-road Vehicles	1,711	87
Electricity	156	8
Natural Gas	83	4
Solid Waste	9	<1
Water Use	7	<1
Landscaping	<1	<1
Total	**1,966**	**100**
County GHG Threshold	**2,500**	**--**
Impact?	No	--

Source: CalEEMod Version 2013.2.2. See Attachment A for model output.

CUMULATIVE IMPACTS

Criteria Air Pollutants

The geographic context for the analysis of cumulative impacts relative to criteria air pollutants is the SDAB. San Diego County is presently designated as being a non-attainment area for the federal ozone standard; specifically, San Diego County is classified as a marginal nonattainment area for the federal 2008 8-hr ozone standard. The County is also a non-attainment area for the CAAQS for ozone, $PM_{10,}$ and $PM_{2.5}$. Consequently, the pollutants of concern are PM_{10}, $PM_{2.5}$, and ozone precursors (VOC and NO_X). If a project exceeds the regional thresholds for PM_{10}, or $PM_{2.5}$, then it would contribute to a cumulatively considerable impact for those pollutants. If a project exceeds the regional threshold for VOC and NO_X, then it follows that the project would contribute to a cumulatively considerable impact for ozone.

As shown in Table 3, the project's construction-generated emissions would not exceed the applicable SDAPCD's regional thresholds of significance. As shown in Table 5, the project's operational emissions would not exceed the SDAPCD's regional thresholds of significance. Therefore, project construction and operation would not result in a significant cumulative criteria pollutant impact.

Additionally, it is assumed that a project that conforms to the applicable planning document for the lead agency and does not have emissions exceeding the significance thresholds would not result in a cumulatively considerable net increase to ozone. It is assumed that SDAPCD's Regional Attainment Strategy accounts for growth identified in planning documents that were adopted prior to development of the Regional Attainment Strategy. In other words, it is reasonable to conclude that if a project is consistent with the applicable general plan land use designation (or similar planning document), and if the general plan (or other plan) was adopted prior to the Regional Attainment Strategy, then the growth generated by the project would be consistent with the growth assumed within the Regional Attainment Strategy. The proposed project is consistent with the 1988 Master Plan for the CSUSM campus. The most recent Regional Attainment Strategy is the 2009 Regional Attainment Strategy Revision. Therefore, the project's emissions were accounted for in the SDACPD's Regional Air Quality Strategy. There is no applicable air quality plan for particulate matter; however, as shown in Table 5, the project would not exceed any significance threshold for any criteria pollutant during operation. Maximum daily emissions would be less than 10 percent of the significance thresholds for particulate matter. Therefore, the proposed project would not result in a significant cumulative impact for criteria pollutants during operation.

Greenhouse Gas Emissions

Individual projects of any size are generally of insufficient magnitude by themselves to influence climate change or result in a substantial contribution to the global GHG inventory. Thus, GHG impacts are recognized as exclusively cumulative impacts; there are no non-cumulative GHG emissions impacts from a climate change perspective (CAPCOA 2008). Accordingly, the discussion of the proposed project's GHG emissions above under construction and operation address the project's cumulative impact related to GHG emissions. The project would not result in cumulatively considerable GHG emissions.

SUMMARY

The proposed project would not generate criteria pollutant or GHG emissions during construction or operation that would exceed the applicable significance thresholds. No mitigation measures are required.

If you have any questions regarding this analysis, please do not hesitate to call at (916) 325-1429 or email at chryss.meier@atkinsglobal.com.

Sincerely,

Chryss Meier
Senior Scientist

Attachment A: CalEEMod Air Quality Model Output

ATKINS

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Attachment A
CalEEMod Air Quality Model Output

CSUSM EL Building

San Diego County APCD Air District, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
University/College (4Yr)	428.00	Student	0.46	52,300.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.6	**Precipitation Freq (Days)**	40
Climate Zone	13			**Operational Year**	2019
Utility Company	San Diego Gas & Electric				
CO2 Intensity (lb/MWhr)	720.49	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Project Description: 20,000 square feet site size, 52,300 square feet useable space

Traffic Study - new building serves additional 428 FTE students

Construction Phase - site preparation and relocation of utilities (2 months), grading of the site (2 months), building construction (12 months), and architectural coating (3 months)

Vehicle Trips - revised traffic report -- 1,716 daily trip ends / 428 additional FTE students

Area Mitigation -

Energy Mitigation -

Water Mitigation -

Waste Mitigation -

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	5.00	44.00
tblConstructionPhase	NumDays	100.00	261.00

tblConstructionPhase	NumDays	2.00	43.00
tblConstructionPhase	NumDays	1.00	43.00
tblConstructionPhase	PhaseEndDate	12/29/2017	12/31/2017
tblGrading	AcresOfGrading	21.50	0.50
tblLandUse	LandUseSquareFeet	78,665.32	52,300.00
tblLandUse	LotAcreage	1.81	0.46
tblProjectCharacteristics	OperationalYear	2014	2019
tblVehicleTrips	ST_TR	1.30	4.01
tblVehicleTrips	SU_TR	0.00	4.01
tblVehicleTrips	WD_TR	2.38	4.01

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					
2017	0.0542	0.4993	0.3526	4.9000e-004	0.0190	0.0322	0.0512	9.6100e-003	0.0302	0.0398	0.0000	44.0503	44.0503	0.0104	0.0000	44.2683
2018	0.1604	1.5334	1.2543	2.0400e-003	0.0307	0.0936	0.1243	8.3000e-003	0.0861	0.0944	0.0000	179.3263	179.3263	0.0432	0.0000	180.2331
2019	0.6121	0.0407	0.0434	7.0000e-005	7.1000e-004	2.8400e-003	3.5400e-003	1.9000e-004	2.8400e-003	3.0300e-003	0.0000	6.2036	6.2036	5.0000e-004	0.0000	6.2142
Total	**0.8267**	**2.0734**	**1.6502**	**2.6000e-003**	**0.0504**	**0.1287**	**0.1790**	**0.0181**	**0.1191**	**0.1372**	**0.0000**	**229.5802**	**229.5802**	**0.0541**	**0.0000**	**230.7156**

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					
2017	0.0542	0.4993	0.3526	4.9000e-004	0.0190	0.0322	0.0512	9.6100e-003	0.0302	0.0398	0.0000	44.0502	44.0502	0.0104	0.0000	44.2682
2018	0.1604	1.5334	1.2543	2.0400e-003	0.0307	0.0936	0.1243	8.3000e-003	0.0861	0.0944	0.0000	179.3261	179.3261	0.0432	0.0000	180.2330
2019	0.6121	0.0407	0.0434	7.0000e-005	7.1000e-004	2.8400e-003	3.5400e-003	1.9000e-004	2.8400e-003	3.0300e-003	0.0000	6.2036	6.2036	5.0000e-004	0.0000	6.2142
Total	**0.8267**	**2.0734**	**1.6502**	**2.6000e-003**	**0.0504**	**0.1287**	**0.1790**	**0.0181**	**0.1191**	**0.1372**	**0.0000**	**229.5800**	**229.5800**	**0.0541**	**0.0000**	**230.7154**

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

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.2652	4.0000e-005	3.9700e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	7.6500e-003	7.6500e-003	2.0000e-005	0.0000	8.0800e-003
Energy	0.0107	0.0973	0.0818	5.8000e-004		7.4000e-003	7.4000e-003		7.4000e-003	7.4000e-003	0.0000	276.2088	276.2088	8.8800e-003	3.3600e-003	277.4371
Mobile	0.9406	2.0588	9.4229	0.0238	1.6300	0.0284	1.6584	0.4360	0.0262	0.4621	0.0000	1,709.6424	1,709.6424	0.0675	0.0000	1,711.0604
Waste						0.0000	0.0000		0.0000	0.0000	15.8556	0.0000	15.8556	0.9370	0.0000	35.5335
Water						0.0000	0.0000		0.0000	0.0000	0.2907	9.1038	9.3945	0.0302	7.8000e-004	10.2714
Total	**1.2165**	**2.1562**	**9.5086**	**0.0243**	**1.6300**	**0.0358**	**1.6658**	**0.4360**	**0.0336**	**0.4695**	**16.1464**	**1,994.9626**	**2,011.1090**	**1.0437**	**4.1400e-003**	**2,034.3104**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.2652	4.0000e-005	3.9700e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	7.6500e-003	7.6500e-003	2.0000e-005	0.0000	8.0800e-003
Energy	8.3000e-003	0.0755	0.0634	4.5000e-004		5.7400e-003	5.7400e-003		5.7400e-003	5.7400e-003	0.0000	237.9577	237.9577	7.8500e-003	2.8000e-003	238.9916
Mobile	0.9406	2.0588	9.4229	0.0238	1.6300	0.0284	1.6584	0.4360	0.0262	0.4621	0.0000	1,709.6424	1,709.6424	0.0675	0.0000	1,711.0604
Waste						0.0000	0.0000		0.0000	0.0000	3.9639	0.0000	3.9639	0.2343	0.0000	8.8834
Water						0.0000	0.0000		0.0000	0.0000	0.2035	6.2779	6.4814	0.0212	5.5000e-004	7.0949
Total	**1.2141**	**2.1343**	**9.4903**	**0.0242**	**1.6300**	**0.0341**	**1.6641**	**0.4360**	**0.0319**	**0.4679**	**4.1674**	**1,953.8856**	**1,958.0530**	**0.3308**	**3.3500e-003**	**1,966.0383**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.20**	**1.01**	**0.19**	**0.53**	**0.00**	**4.64**	**0.10**	**0.00**	**4.94**	**0.35**	**74.19**	**2.06**	**2.64**	**68.30**	**19.08**	**3.36**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	9/1/2017	10/31/2017	5	43	
2	Grading	Grading	11/1/2017	12/31/2017	5	43	
3	Building Construction	Building Construction	1/1/2018	12/31/2018	5	261	
4	Architectural Coating	Architectural Coating	1/1/2019	3/1/2019	5	44	

Acres of Grading (Site Preparation Phase): 0.5

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 78,450; Non-Residential Outdoor: 26,150 (Architectural Coating –

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Graders	1	8.00	174	0.41
Site Preparation	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Grading	Concrete/Industrial Saws	1	8.00	81	0.73
Grading	Rubber Tired Dozers	1	1.00	255	0.40
Grading	Tractors/Loaders/Backhoes	2	6.00	97	0.37
Building Construction	Cranes	1	4.00	226	0.29
Building Construction	Forklifts	2	6.00	89	0.20
Building Construction	Tractors/Loaders/Backhoes	2	8.00	97	0.37
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
Site Preparation	2	5.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	4	10.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	5	22.00	9.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	4.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Site Preparation - 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					
Fugitive Dust					2.7000e-004	0.0000	2.7000e-004	3.0000e-005	0.0000	3.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0273	0.2727	0.1555	2.0000e-004		0.0166	0.0166		0.0152	0.0152	0.0000	18.6437	18.6437	5.7100e-003	0.0000	18.7636
Total	**0.0273**	**0.2727**	**0.1555**	**2.0000e-004**	**2.7000e-004**	**0.0166**	**0.0168**	**3.0000e-005**	**0.0152**	**0.0153**	**0.0000**	**18.6437**	**18.6437**	**5.7100e-003**	**0.0000**	**18.7636**

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	3.3000e-004	4.4000e-004	4.1900e-003	1.0000e-005	8.6000e-004	1.0000e-005	8.7000e-004	2.3000e-004	1.0000e-005	2.3000e-004	0.0000	0.7723	0.7723	4.0000e-005	0.0000	0.7731
Total	**3.3000e-004**	**4.4000e-004**	**4.1900e-003**	**1.0000e-005**	**8.6000e-004**	**1.0000e-005**	**8.7000e-004**	**2.3000e-004**	**1.0000e-005**	**2.3000e-004**	**0.0000**	**0.7723**	**0.7723**	**4.0000e-005**	**0.0000**	**0.7731**

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					2.7000e-004	0.0000	2.7000e-004	3.0000e-005	0.0000	3.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Off-Road	0.0273	0.2727	0.1555	2.0000e-004		0.0166	0.0166		0.0152	0.0152	0.0000	18.6437	18.6437	5.7100e-003	0.0000	18.7636
Total	**0.0273**	**0.2727**	**0.1555**	**2.0000e-004**	**2.7000e-004**	**0.0166**	**0.0168**	**3.0000e-005**	**0.0152**	**0.0153**	**0.0000**	**18.6437**	**18.6437**	**5.7100e-003**	**0.0000**	**18.7636**

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	3.3000e-004	4.4000e-004	4.1900e-003	1.0000e-005	8.6000e-004	1.0000e-005	8.7000e-004	2.3000e-004	1.0000e-005	2.3000e-004	0.0000	0.7723	0.7723	4.0000e-005	0.0000	0.7731
Total	**3.3000e-004**	**4.4000e-004**	**4.1900e-003**	**1.0000e-005**	**8.6000e-004**	**1.0000e-005**	**8.7000e-004**	**2.3000e-004**	**1.0000e-005**	**2.3000e-004**	**0.0000**	**0.7723**	**0.7723**	**4.0000e-005**	**0.0000**	**0.7731**

3.3 Grading - 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					
Fugitive Dust					0.0162	0.0000	0.0162	8.9000e-003	0.0000	8.9000e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0259	0.2252	0.1845	2.6000e-004		0.0156	0.0156		0.0149	0.0149	0.0000	23.0897	23.0897	4.5500e-003	0.0000	23.1852
Total	**0.0259**	**0.2252**	**0.1845**	**2.6000e-004**	**0.0162**	**0.0156**	**0.0318**	**8.9000e-003**	**0.0149**	**0.0238**	**0.0000**	**23.0897**	**23.0897**	**4.5500e-003**	**0.0000**	**23.1852**

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	6.7000e-004	8.9000e-004	8.3700e-003	2.0000e-005	1.7200e-003	1.0000e-005	1.7400e-003	4.6000e-004	1.0000e-005	4.7000e-004	0.0000	1.5446	1.5446	8.0000e-005	0.0000	1.5463
Total	**6.7000e-004**	**8.9000e-004**	**8.3700e-003**	**2.0000e-005**	**1.7200e-003**	**1.0000e-005**	**1.7400e-003**	**4.6000e-004**	**1.0000e-005**	**4.7000e-004**	**0.0000**	**1.5446**	**1.5446**	**8.0000e-005**	**0.0000**	**1.5463**

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					0.0162	0.0000	0.0162	8.9000e-003	0.0000	8.9000e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0259	0.2252	0.1845	2.6000e-004		0.0156	0.0156		0.0149	0.0149	0.0000	23.0896	23.0896	4.5500e-003	0.0000	23.1852
Total	**0.0259**	**0.2252**	**0.1845**	**2.6000e-004**	**0.0162**	**0.0156**	**0.0318**	**8.9000e-003**	**0.0149**	**0.0238**	**0.0000**	**23.0896**	**23.0896**	**4.5500e-003**	**0.0000**	**23.1852**

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	6.7000e-004	8.9000e-004	8.3700e-003	2.0000e-005	1.7200e-003	1.0000e-005	1.7400e-003	4.6000e-004	1.0000e-005	4.7000e-004	0.0000	1.5446	1.5446	8.0000e-005	0.0000	1.5463
Total	**6.7000e-004**	**8.9000e-004**	**8.3700e-003**	**2.0000e-005**	**1.7200e-003**	**1.0000e-005**	**1.7400e-003**	**4.6000e-004**	**1.0000e-005**	**4.7000e-004**	**0.0000**	**1.5446**	**1.5446**	**8.0000e-005**	**0.0000**	**1.5463**

3.4 Building Construction - 2018

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	0.1408	1.4300	1.0080	1.4800e-003		0.0921	0.0921		0.0847	0.0847	0.0000	134.9913	134.9913	0.0420	0.0000	135.8738
Total	**0.1408**	**1.4300**	**1.0080**	**1.4800e-003**		**0.0921**	**0.0921**		**0.0847**	**0.0847**	**0.0000**	**134.9913**	**134.9913**	**0.0420**	**0.0000**	**135.8738**

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	0.0115	0.0926	0.1452	2.8000e-004	7.6400e-003	1.3600e-003	9.0000e-003	2.1900e-003	1.2500e-003	3.4400e-003	0.0000	24.4832	24.4832	1.8000e-004	0.0000	24.4871
Worker	8.1100e-003	0.0108	0.1011	2.8000e-004	0.0230	1.7000e-004	0.0232	6.1200e-003	1.6000e-004	6.2700e-003	0.0000	19.8518	19.8518	9.8000e-004	0.0000	19.8722
Total	**0.0196**	**0.1034**	**0.2463**	**5.6000e-004**	**0.0307**	**1.5300e-003**	**0.0322**	**8.3100e-003**	**1.4100e-003**	**9.7100e-003**	**0.0000**	**44.3349**	**44.3349**	**1.1600e-003**	**0.0000**	**44.3593**

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	0.1408	1.4300	1.0080	1.4800e-003		0.0921	0.0921		0.0847	0.0847	0.0000	134.9912	134.9912	0.0420	0.0000	135.8737
Total	**0.1408**	**1.4300**	**1.0080**	**1.4800e-003**		**0.0921**	**0.0921**		**0.0847**	**0.0847**	**0.0000**	**134.9912**	**134.9912**	**0.0420**	**0.0000**	**135.8737**

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	0.0115	0.0926	0.1452	2.8000e-004	7.6400e-003	1.3600e-003	9.0000e-003	2.1900e-003	1.2500e-003	3.4400e-003	0.0000	24.4832	24.4832	1.8000e-004	0.0000	24.4871
Worker	8.1100e-003	0.0108	0.1011	2.8000e-004	0.0230	1.7000e-004	0.0232	6.1200e-003	1.6000e-004	6.2700e-003	0.0000	19.8518	19.8518	9.8000e-004	0.0000	19.8722
Total	**0.0196**	**0.1034**	**0.2463**	**5.6000e-004**	**0.0307**	**1.5300e-003**	**0.0322**	**8.3100e-003**	**1.4100e-003**	**9.7100e-003**	**0.0000**	**44.3349**	**44.3349**	**1.1600e-003**	**0.0000**	**44.3593**

3.5 Architectural Coating - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.6060					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	5.8600e-003	0.0404	0.0405	7.0000e-005		2.8300e-003	2.8300e-003		2.8300e-003	2.8300e-003	0.0000	5.6172	5.6172	4.7000e-004	0.0000	5.6271
Total	**0.6119**	**0.0404**	**0.0405**	**7.0000e-005**		**2.8300e-003**	**2.8300e-003**		**2.8300e-003**	**2.8300e-003**	**0.0000**	**5.6172**	**5.6172**	**4.7000e-004**	**0.0000**	**5.6271**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.3000e-004	3.1000e-004	2.8500e-003	1.0000e-005	7.1000e-004	1.0000e-005	7.1000e-004	1.9000e-004	0.0000	1.9000e-004	0.0000	0.5865	0.5865	3.0000e-005	0.0000	0.5871
Total	**2.3000e-004**	**3.1000e-004**	**2.8500e-003**	**1.0000e-005**	**7.1000e-004**	**1.0000e-005**	**7.1000e-004**	**1.9000e-004**	**0.0000**	**1.9000e-004**	**0.0000**	**0.5865**	**0.5865**	**3.0000e-005**	**0.0000**	**0.5871**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.6060					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Off-Road	5.8600e-003	0.0404	0.0405	7.0000e-005		2.8300e-003	2.8300e-003		2.8300e-003	2.8300e-003	0.0000	5.6172	5.6172	4.7000e-004	0.0000	5.6271
Total	**0.6119**	**0.0404**	**0.0405**	**7.0000e-005**		**2.8300e-003**	**2.8300e-003**		**2.8300e-003**	**2.8300e-003**	**0.0000**	**5.6172**	**5.6172**	**4.7000e-004**	**0.0000**	**5.6271**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.3000e-004	3.1000e-004	2.8500e-003	1.0000e-005	7.1000e-004	1.0000e-005	7.1000e-004	1.9000e-004	0.0000	1.9000e-004	0.0000	0.5865	0.5865	3.0000e-005	0.0000	0.5871
Total	**2.3000e-004**	**3.1000e-004**	**2.8500e-003**	**1.0000e-005**	**7.1000e-004**	**1.0000e-005**	**7.1000e-004**	**1.9000e-004**	**0.0000**	**1.9000e-004**	**0.0000**	**0.5865**	**0.5865**	**3.0000e-005**	**0.0000**	**0.5871**

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	0.9406	2.0588	9.4229	0.0238	1.6300	0.0284	1.6584	0.4360	0.0262	0.4621	0.0000	1,709.6424	1,709.6424	0.0675	0.0000	1,711.0604
Unmitigated	0.9406	2.0588	9.4229	0.0238	1.6300	0.0284	1.6584	0.4360	0.0262	0.4621	0.0000	1,709.6424	1,709.6424	0.0675	0.0000	1,711.0604

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
University/College (4Yr)	1,716.28	1,716.28	1716.28	4,334,690	4,334,690
Total	1,716.28	1,716.28	1,716.28	4,334,690	4,334,690

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-	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
University/College (4Yr)	9.50	7.30	7.30	6.40	88.60	5.00	91	9	0

LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
0.512639	0.073513	0.191470	0.131122	0.036200	0.005158	0.012615	0.022741	0.001866	0.002067	0.006563	0.000594	0.003452

5.0 Energy Detail

4.4 Fleet Mix

Historical Energy Use: N

5.1 Mitigation Measures Energy

Exceed Title 24

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 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 Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	170.2373	170.2373	6.8500e-003	1.4200e-003	170.8207
NaturalGas Mitigated	8.3000e-003	0.0755	0.0634	4.5000e-004		5.7400e-003	5.7400e-003		5.7400e-003	5.7400e-003	0.0000	82.1632	82.1632	1.5700e-003	1.5100e-003	82.6633
NaturalGas Unmitigated	0.0107	0.0973	0.0818	5.8000e-004		7.4000e-003	7.4000e-003		7.4000e-003	7.4000e-003	0.0000	105.9715	105.9715	2.0300e-003	1.9400e-003	106.6164

Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	155.7945	155.7945	6.2700e-003	1.3000e-003	156.3284

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					
University/College (4Yr)	1.98583e+006	0.0107	0.0973	0.0818	5.8000e-004		7.4000e-003	7.4000e-003		7.4000e-003	7.4000e-003	0.0000	105.9715	105.9715	2.0300e-003	1.9400e-003	106.6164
Total		**0.0107**	**0.0973**	**0.0818**	**5.8000e-004**		**7.4000e-003**	**7.4000e-003**		**7.4000e-003**	**7.4000e-003**	**0.0000**	**105.9715**	**105.9715**	**2.0300e-003**	**1.9400e-003**	**106.6164**

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					
University/College (4Yr)	1.53968e+006	8.3000e-003	0.0755	0.0634	4.5000e-004		5.7400e-003	5.7400e-003		5.7400e-003	5.7400e-003	0.0000	82.1632	82.1632	1.5700e-003	1.5100e-003	82.6633
Total		**8.3000e-003**	**0.0755**	**0.0634**	**4.5000e-004**		**5.7400e-003**	**5.7400e-003**		**5.7400e-003**	**5.7400e-003**	**0.0000**	**82.1632**	**82.1632**	**1.5700e-003**	**1.5100e-003**	**82.6633**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
University/College (4Yr)	520908	170.2373	6.8500e-003	1.4200e-003	170.8207
Total		**170.2373**	**6.8500e-003**	**1.4200e-003**	**170.8207**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
University/College (4Yr)	476714	155.7945	6.2700e-003	1.3000e-003	156.3284
Total		**155.7945**	**6.2700e-003**	**1.3000e-003**	**156.3284**

6.0 Area Detail

6.1 Mitigation Measures Area

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	0.2652	4.0000e-005	3.9700e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	7.6500e-003	7.6500e-003	2.0000e-005	0.0000	8.0800e-003
Unmitigated	0.2652	4.0000e-005	3.9700e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	7.6500e-003	7.6500e-003	2.0000e-005	0.0000	8.0800e-003

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0606					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.2043					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	3.8000e-004	4.0000e-005	3.9700e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	7.6500e-003	7.6500e-003	2.0000e-005	0.0000	8.0800e-003
Total	**0.2652**	**4.0000e-005**	**3.9700e-003**	**0.0000**		**1.0000e-005**	**1.0000e-005**		**1.0000e-005**	**1.0000e-005**	**0.0000**	**7.6500e-003**	**7.6500e-003**	**2.0000e-005**	**0.0000**	**8.0800e-003**

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	0.0606					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.2043					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Landscaping	3.8000e-004	4.0000e-005	3.9700e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	7.6500e-003	7.6500e-003	2.0000e-005	0.0000	8.0800e-003
Total	**0.2652**	**4.0000e-005**	**3.9700e-003**	**0.0000**		**1.0000e-005**	**1.0000e-005**		**1.0000e-005**	**1.0000e-005**	**0.0000**	**7.6500e-003**	**7.6500e-003**	**2.0000e-005**	**0.0000**	**8.0800e-003**

7.0 Water Detail

7.1 Mitigation Measures Water

Apply Water Conservation Strategy

Install Low Flow Bathroom Faucet

Install Low Flow Kitchen Faucet

Install Low Flow Toilet

Install Low Flow Shower

Use Water Efficient Irrigation System

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	6.4814	0.0212	5.5000e-004	7.0949
Unmitigated	9.3945	0.0302	7.8000e-004	10.2714

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
University/College (4Yr)	0.916391 / 1.43333	9.3945	0.0302	7.8000e-004	10.2714

Total		**9.3945**	**0.0302**	**7.8000e-004**	**10.2714**

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
University/College (4Yr)	0.641474 / 1.00333	6.4814	0.0212	5.5000e-004	7.0949
Total		**6.4814**	**0.0212**	**5.5000e-004**	**7.0949**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Institute Recycling and Composting Services

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	3.9639	0.2343	0.0000	8.8834
Unmitigated	15.8556	0.9370	0.0000	35.5335

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
University/College (4Yr)	78.11	15.8556	0.9370	0.0000	35.5335
Total		**15.8556**	**0.9370**	**0.0000**	**35.5335**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
University/College (4Yr)	19.5275	3.9639	0.2343	0.0000	8.8834
Total		**3.9639**	**0.2343**	**0.0000**	**8.8834**

9.0 Operational Offroad

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

10.0 Vegetation

CSUSM EL Building

San Diego County APCD Air District, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
University/College (4Yr)	428.00	Student	0.46	52,300.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.6	**Precipitation Freq (Days)**	40
Climate Zone	13			**Operational Year**	2019
Utility Company	San Diego Gas & Electric				
CO2 Intensity (lb/MWhr)	720.49	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Project Description: 20,000 square feet site size, 52,300 square feet useable space

Traffic Study - new building serves additional 428 FTE students

Construction Phase - site preparation and relocation of utilities (2 months), grading of the site (2 months), building construction (12 months), and architectural coating (3 months)

Vehicle Trips - revised traffic report -- 1,716 daily trip ends / 428 additional FTE students

Area Mitigation -

Energy Mitigation -

Water Mitigation -

Waste Mitigation -

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	5.00	44.00
tblConstructionPhase	NumDays	100.00	261.00

tblConstructionPhase	NumDays	2.00	43.00
tblConstructionPhase	NumDays	1.00	43.00
tblConstructionPhase	PhaseEndDate	12/29/2017	12/31/2017
tblGrading	AcresOfGrading	21.50	0.50
tblLandUse	LandUseSquareFeet	78,665.32	52,300.00
tblLandUse	LotAcreage	1.81	0.46
tblProjectCharacteristics	OperationalYear	2014	2019
tblVehicleTrips	ST_TR	1.30	4.01
tblVehicleTrips	SU_TR	0.00	4.01
tblVehicleTrips	WD_TR	2.38	4.01

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					
2017	1.2853	12.7038	8.9871	0.0131	0.8349	0.7708	1.5621	0.4356	0.7091	1.1291	0.0000	1,267.3149	1,267.3149	0.2949	0.0000	1,273.5076
2018	1.2233	11.7216	9.4275	0.0158	0.2405	0.7172	0.9576	0.0650	0.6598	0.7248	0.0000	1,524.5390	1,524.5390	0.3648	0.0000	1,532.1988
2019	27.8239	1.8480	1.9768	3.3900e-003	0.0329	0.1290	0.1619	8.7200e-003	0.1290	0.1377	0.0000	312.4342	312.4342	0.0252	0.0000	312.9629
Total	**30.3325**	**26.2734**	**20.3914**	**0.0322**	**1.1082**	**1.6170**	**2.6816**	**0.5093**	**1.4979**	**1.9916**	**0.0000**	**3,104.2881**	**3,104.2881**	**0.6848**	**0.0000**	**3,118.6693**

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					
2017	1.2853	12.7038	8.9871	0.0131	0.8349	0.7708	1.5621	0.4356	0.7091	1.1291	0.0000	1,267.3149	1,267.3149	0.2949	0.0000	1,273.5076
2018	1.2233	11.7216	9.4275	0.0158	0.2405	0.7172	0.9576	0.0650	0.6598	0.7248	0.0000	1,524.5390	1,524.5390	0.3648	0.0000	1,532.1988
2019	27.8239	1.8480	1.9768	3.3900e-003	0.0329	0.1290	0.1619	8.7200e-003	0.1290	0.1377	0.0000	312.4342	312.4342	0.0252	0.0000	312.9629
Total	**30.3325**	**26.2734**	**20.3914**	**0.0322**	**1.1082**	**1.6170**	**2.6816**	**0.5093**	**1.4979**	**1.9916**	**0.0000**	**3,104.2881**	**3,104.2881**	**0.6848**	**0.0000**	**3,118.6693**

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

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	1.4555	4.1000e-004	0.0441	0.0000		1.6000e-004	1.6000e-004		1.6000e-004	1.6000e-004		0.0937	0.0937	2.5000e-004		0.0990
Energy	0.0587	0.5334	0.4481	3.2000e-003		0.0405	0.0405		0.0405	0.0405		640.0745	640.0745	0.0123	0.0117	643.9698
Mobile	5.1829	10.6993	50.3397	0.1364	9.1716	0.1558	9.3274	2.4483	0.1437	2.5920		10,799.7513	10,799.7513	0.4093		10,808.3467
Total	**6.6971**	**11.2332**	**50.8319**	**0.1396**	**9.1716**	**0.1965**	**9.3681**	**2.4483**	**0.1844**	**2.6327**		**11,439.9194**	**11,439.9194**	**0.4218**	**0.0117**	**11,452.4156**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	1.4555	4.1000e-004	0.0441	0.0000		1.6000e-004	1.6000e-004		1.6000e-004	1.6000e-004		0.0937	0.0937	2.5000e-004		0.0990
Energy	0.0455	0.4136	0.3474	2.4800e-003		0.0314	0.0314		0.0314	0.0314		496.2710	496.2710	9.5100e-003	9.1000e-003	499.2912
Mobile	5.1829	10.6993	50.3397	0.1364	9.1716	0.1558	9.3274	2.4483	0.1437	2.5920		10,799.7513	10,799.7513	0.4093		10,808.3467
Total	**6.6839**	**11.1133**	**50.7312**	**0.1389**	**9.1716**	**0.1874**	**9.3590**	**2.4483**	**0.1753**	**2.6236**		**11,296.11 59**	**11,296.115 9**	**0.4191**	**9.1000e-003**	**11,307.736 9**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.20**	**1.07**	**0.20**	**0.52**	**0.00**	**4.64**	**0.10**	**0.00**	**4.94**	**0.35**	**0.00**	**1.26**	**1.26**	**0.65**	**22.42**	**1.26**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	9/1/2017	10/31/2017	5	43	
2	Grading	Grading	11/1/2017	12/31/2017	5	43	
3	Building Construction	Building Construction	1/1/2018	12/31/2018	5	261	
4	Architectural Coating	Architectural Coating	1/1/2019	3/1/2019	5	44	

Acres of Grading (Site Preparation Phase): 0.5

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 78,450; Non-Residential Outdoor: 26,150 (Architectural Coating –

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor

Site Preparation	Graders	1	8.00	174	0.41
Site Preparation	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Grading	Concrete/Industrial Saws	1	8.00	81	0.73
Grading	Rubber Tired Dozers	1	1.00	255	0.40
Grading	Tractors/Loaders/Backhoes	2	6.00	97	0.37
Building Construction	Cranes	1	4.00	226	0.29
Building Construction	Forklifts	2	6.00	89	0.20
Building Construction	Tractors/Loaders/Backhoes	2	8.00	97	0.37
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
Site Preparation	2	5.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	4	10.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	5	22.00	9.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	4.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Site Preparation - 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					
Fugitive Dust					0.0123	0.0000	0.0123	1.3300e-003	0.0000	1.3300e-003			0.0000			0.0000
Off-Road	1.2694	12.6852	7.2319	9.3300e-003		0.7705	0.7705		0.7089	0.7089		955.8663	955.8663	0.2929		962.0167

Total	**1.2694**	**12.6852**	**7.2319**	**9.3300e-003**	**0.0123**	**0.7705**	**0.7828**	**1.3300e-003**	**0.7089**	**0.7102**		**955.8663**	**955.8663**	**0.2929**		**962.0167**

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	0.0159	0.0186	0.2023	5.2000e-004	0.0411	3.0000e-004	0.0414	0.0109	2.8000e-004	0.0112		41.7509	41.7509	2.0100e-003		41.7932
Total	**0.0159**	**0.0186**	**0.2023**	**5.2000e-004**	**0.0411**	**3.0000e-004**	**0.0414**	**0.0109**	**2.8000e-004**	**0.0112**		**41.7509**	**41.7509**	**2.0100e-003**		**41.7932**

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					0.0123	0.0000	0.0123	1.3300e-003	0.0000	1.3300e-003			0.0000			0.0000
Off-Road	1.2694	12.6852	7.2319	9.3300e-003		0.7705	0.7705		0.7089	0.7089	0.0000	955.8663	955.8663	0.2929		962.0167
Total	**1.2694**	**12.6852**	**7.2319**	**9.3300e-003**	**0.0123**	**0.7705**	**0.7828**	**1.3300e-003**	**0.7089**	**0.7102**	**0.0000**	**955.8663**	**955.8663**	**0.2929**		**962.0167**

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	0.0159	0.0186	0.2023	5.2000e-004	0.0411	3.0000e-004	0.0414	0.0109	2.8000e-004	0.0112		41.7509	41.7509	2.0100e-003		41.7932
Total	**0.0159**	**0.0186**	**0.2023**	**5.2000e-004**	**0.0411**	**3.0000e-004**	**0.0414**	**0.0109**	**2.8000e-004**	**0.0112**		**41.7509**	**41.7509**	**2.0100e-003**		**41.7932**

3.3 Grading - 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					
Fugitive Dust					0.7528	0.0000	0.7528	0.4138	0.0000	0.4138			0.0000			0.0000
Off-Road	1.2049	10.4761	8.5825	0.0120		0.7266	0.7266		0.6930	0.6930		1,183.8131	1,183.8131	0.2333		1,188.7118
Total	**1.2049**	**10.4761**	**8.5825**	**0.0120**	**0.7528**	**0.7266**	**1.4794**	**0.4138**	**0.6930**	**1.1068**		**1,183.8131**	**1,183.8131**	**0.2333**		**1,188.7118**

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	0.0318	0.0373	0.4046	1.0400e-003	0.0822	6.0000e-004	0.0827	0.0218	5.5000e-004	0.0223		83.5017	83.5017	4.0300e-003		83.5863
Total	**0.0318**	**0.0373**	**0.4046**	**1.0400e-003**	**0.0822**	**6.0000e-004**	**0.0827**	**0.0218**	**5.5000e-004**	**0.0223**		**83.5017**	**83.5017**	**4.0300e-003**		**83.5863**

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					0.7528	0.0000	0.7528	0.4138	0.0000	0.4138			0.0000			0.0000
Off-Road	1.2049	10.4761	8.5825	0.0120		0.7266	0.7266		0.6930	0.6930	0.0000	1,183.8131	1,183.8131	0.2333		1,188.7118
Total	**1.2049**	**10.4761**	**8.5825**	**0.0120**	**0.7528**	**0.7266**	**1.4794**	**0.4138**	**0.6930**	**1.1068**	**0.0000**	**1,183.8131**	**1,183.8131**	**0.2333**		**1,188.7118**

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	0.0318	0.0373	0.4046	1.0400e-003	0.0822	6.0000e-004	0.0827	0.0218	5.5000e-004	0.0223		83.5017	83.5017	4.0300e-003		83.5863
Total	**0.0318**	**0.0373**	**0.4046**	**1.0400e-003**	**0.0822**	**6.0000e-004**	**0.0827**	**0.0218**	**5.5000e-004**	**0.0223**		**83.5017**	**83.5017**	**4.0300e-003**		**83.5863**

3.4 Building Construction - 2018

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	1.0786	10.9578	7.7239	0.0113		0.7055	0.7055		0.6491	0.6491		1,140.2487	1,140.2487	0.3550		1,147.7032
Total	**1.0786**	**10.9578**	**7.7239**	**0.0113**		**0.7055**	**0.7055**		**0.6491**	**0.6491**		**1,140.2487**	**1,140.2487**	**0.3550**		**1,147.7032**

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	0.0810	0.6890	0.8955	2.1300e-003	0.0597	0.0104	0.0701	0.0170	9.5600e-003	0.0266		207.4771	207.4771	1.5400e-003		207.5094
Worker	0.0637	0.0749	0.8081	2.2900e-003	0.1807	1.2900e-003	0.1820	0.0479	1.1900e-003	0.0491		176.8132	176.8132	8.2400e-003		176.9862
Total	**0.1447**	**0.7638**	**1.7035**	**4.4200e-003**	**0.2405**	**0.0117**	**0.2521**	**0.0650**	**0.0108**	**0.0757**		**384.2903**	**384.2903**	**9.7800e-003**		**384.4956**

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	1.0786	10.9578	7.7239	0.0113		0.7055	0.7055		0.6491	0.6491	0.0000	1,140.2487	1,140.2487	0.3550		1,147.7032
Total	**1.0786**	**10.9578**	**7.7239**	**0.0113**		**0.7055**	**0.7055**		**0.6491**	**0.6491**	**0.0000**	**1,140.2487**	**1,140.2487**	**0.3550**		**1,147.7032**

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	0.0810	0.6890	0.8955	2.1300e-003	0.0597	0.0104	0.0701	0.0170	9.5600e-003	0.0266		207.4771	207.4771	1.5400e-003		207.5094
Worker	0.0637	0.0749	0.8081	2.2900e-003	0.1807	1.2900e-003	0.1820	0.0479	1.1900e-003	0.0491		176.8132	176.8132	8.2400e-003		176.9862
Total	**0.1447**	**0.7638**	**1.7035**	**4.4200e-003**	**0.2405**	**0.0117**	**0.2521**	**0.0650**	**0.0108**	**0.0757**		**384.2903**	**384.2903**	**9.7800e-003**		**384.4956**

3.5 Architectural Coating - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	27.5467					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000

Off-Road	0.2664	1.8354	1.8413	2.9700e-003		0.1288	0.1288		0.1288	0.1288		281.4481	281.4481	0.0238		281.9473
Total	**27.8131**	**1.8354**	**1.8413**	**2.9700e-003**		**0.1288**	**0.1288**		**0.1288**	**0.1288**		**281.4481**	**281.4481**	**0.0238**		**281.9473**

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	0.0108	0.0126	0.1355	4.2000e-004	0.0329	2.3000e-004	0.0331	8.7200e-003	2.2000e-004	8.9300e-003		30.9861	30.9861	1.4100e-003		31.0157
Total	**0.0108**	**0.0126**	**0.1355**	**4.2000e-004**	**0.0329**	**2.3000e-004**	**0.0331**	**8.7200e-003**	**2.2000e-004**	**8.9300e-003**		**30.9861**	**30.9861**	**1.4100e-003**		**31.0157**

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	27.5467					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2664	1.8354	1.8413	2.9700e-003		0.1288	0.1288		0.1288	0.1288	0.0000	281.4481	281.4481	0.0238		281.9473
Total	**27.8131**	**1.8354**	**1.8413**	**2.9700e-003**		**0.1288**	**0.1288**		**0.1288**	**0.1288**	**0.0000**	**281.4481**	**281.4481**	**0.0238**		**281.9473**

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	0.0108	0.0126	0.1355	4.2000e-004	0.0329	2.3000e-004	0.0331	8.7200e-003	2.2000e-004	8.9300e-003		30.9861	30.9861	1.4100e-003		31.0157
Total	**0.0108**	**0.0126**	**0.1355**	**4.2000e-004**	**0.0329**	**2.3000e-004**	**0.0331**	**8.7200e-003**	**2.2000e-004**	**8.9300e-003**		**30.9861**	**30.9861**	**1.4100e-003**		**31.0157**

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	5.1829	10.6993	50.3397	0.1364	9.1716	0.1558	9.3274	2.4483	0.1437	2.5920		10,799.7513	10,799.7513	0.4093		10,808.3467
Unmitigated	5.1829	10.6993	50.3397	0.1364	9.1716	0.1558	9.3274	2.4483	0.1437	2.5920		10,799.7513	10,799.7513	0.4093		10,808.3467

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
University/College (4Yr)	1,716.28	1,716.28	1716.28	4,334,690	4,334,690
Total	1,716.28	1,716.28	1,716.28	4,334,690	4,334,690

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
University/College (4Yr)	9.50	7.30	7.30	6.40	88.60	5.00	91	9	0

LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
0.512639	0.073513	0.191470	0.131122	0.036200	0.005158	0.012615	0.022741	0.001866	0.002067	0.006563	0.000594	0.003452

5.0 Energy Detail

4.4 Fleet Mix

Historical Energy Use: N

5.1 Mitigation Measures Energy

Exceed Title 24

	ROG	NOx	CO	SO2	Fugitive 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	0.0455	0.4136	0.3474	2.4800e-003		0.0314	0.0314		0.0314	0.0314		496.2710	496.2710	9.5100e-003	9.1000e-003	499.2912
NaturalGas Unmitigated	0.0587	0.5334	0.4481	3.2000e-003		0.0405	0.0405		0.0405	0.0405		640.0745	640.0745	0.0123	0.0117	643.9698

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					
University/College (4Yr)	5440.63	0.0587	0.5334	0.4481	3.2000e-003		0.0405	0.0405		0.0405	0.0405		640.0745	640.0745	0.0123	0.0117	643.9698
Total		**0.0587**	**0.5334**	**0.4481**	**3.2000e-003**		**0.0405**	**0.0405**		**0.0405**	**0.0405**		**640.0745**	**640.0745**	**0.0123**	**0.0117**	**643.9698**

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					
University/College (4Yr)	4.2183	0.0455	0.4136	0.3474	2.4800e-003		0.0314	0.0314		0.0314	0.0314		496.2710	496.2710	9.5100e-003	9.1000e-003	499.2912
Total		**0.0455**	**0.4136**	**0.3474**	**2.4800e-003**		**0.0314**	**0.0314**		**0.0314**	**0.0314**		**496.2710**	**496.2710**	**9.5100e-003**	**9.1000e-003**	**499.2912**

6.0 Area Detail

6.1 Mitigation Measures Area

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	1.4555	4.1000e-004	0.0441	0.0000		1.6000e-004	1.6000e-004		1.6000e-004	1.6000e-004		0.0937	0.0937	2.5000e-004		0.0990

Unmitigated	1.4555	4.1000e-004	0.0441	0.0000		1.6000e-004	1.6000e-004		1.6000e-004	1.6000e-004		0.0937	0.0937	2.5000e-004		0.0990

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.3321					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	1.1192					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	4.1800e-003	4.1000e-004	0.0441	0.0000		1.6000e-004	1.6000e-004		1.6000e-004	1.6000e-004		0.0937	0.0937	2.5000e-004		0.0990
Total	**1.4555**	**4.1000e-004**	**0.0441**	**0.0000**		**1.6000e-004**	**1.6000e-004**		**1.6000e-004**	**1.6000e-004**		**0.0937**	**0.0937**	**2.5000e-004**		**0.0990**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.3321					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	1.1192					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	4.1800e-003	4.1000e-004	0.0441	0.0000		1.6000e-004	1.6000e-004		1.6000e-004	1.6000e-004		0.0937	0.0937	2.5000e-004		0.0990
Total	**1.4555**	**4.1000e-004**	**0.0441**	**0.0000**		**1.6000e-004**	**1.6000e-004**		**1.6000e-004**	**1.6000e-004**		**0.0937**	**0.0937**	**2.5000e-004**		**0.0990**

7.0 Water Detail

7.1 Mitigation Measures Water

Apply Water Conservation Strategy

Install Low Flow Bathroom Faucet

Install Low Flow Kitchen Faucet

Install Low Flow Toilet

Install Low Flow Shower

Use Water Efficient Irrigation System

8.0 Waste Detail

8.1 Mitigation Measures Waste

Institute Recycling and Composting Services

9.0 Operational Offroad

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

10.0 Vegetation

Appendix B
Traffic Noise Calculations

TRAFFIC NOISE LEVELS AND NOISE CONTOURS

Project Number: 100047253
Project Name: CSUSM EL Building

Background Information

Model Description: FHWA Highway Noise Prediction Model (FHWA-RD-77-108) with California Vehicle Noise (CALVENO) Emission Levels.
Source of Traffic Volumes: RBF Consulting, September 29 2015
Community Noise Descriptor: L_{dn}: ____ CNEL: X

Assumed 24-Hour Traffic Distribution:	Day	Evening	Night
Total ADT Volumes	77.70%	12.70%	9.60%
Medium-Duty Trucks	87.43%	5.05%	7.52%
Heavy-Duty Trucks	89.10%	2.84%	8.06%

"-" = contour is located within the roadway right-of-way.
Distance is from the centerline of the roadway segment to the receptor location.

Analysis Condition / Roadway, Segment	Lanes	Median Width	ADT Volume	Design Speed (mph)	Alpha Factor	Vehicle Mix: Medium Trucks	Vehicle Mix: Heavy Trucks	**CNEL at 50 Feet**	Distance to Contour: 70 CNEL	65 CNEL	60 CNEL	55 CNEL
Twin Oaks Valley Road												
North of Barham Dr. / Discovery St.	8	0	45,946	40	0.5	3.0%	2.0%	**76.7**	140	302	651	1,403
North of Barham Dr. / Discovery St. + Project	8	0	46,753	40	0.5	3.0%	2.0%	**76.8**	142	306	659	1,420
Barham Dr. / Discovery St. to Craven Rd.	6	0	32,796	40	0.5	3.0%	2.0%	**72.7**	76	164	352	759
Barham Dr. / Discovery St. to Craven Rd.+Project	6	0	33,517	40	0.5	3.0%	2.0%	**72.8**	77	166	358	770
Barham Drive												
Twin Oaks Valley Rd. to Campus Way	5	0	18,209	40	0.5	3.0%	2.0%	**69.6**	-	101	217	468
Twin Oaks Valley Rd. to Campus Way+Project	5	0	18,295	40	0.5	3.0%	2.0%	**69.6**	-	101	218	469
Campus Way to Industrial St.	5	0	17,606	40	0.5	3.0%	2.0%	**69.4**	-	99	212	457
Campus Way to Industrial St.+Project	5	0	17,984	40	0.5	3.0%	2.0%	**69.5**	-	100	215	464

TRAFFIC NOISE LEVELS AND NOISE CONTOURS

Project Number: 100047253
Project Name: CSUSM EL Building

Background Information

Model Description: FHWA Highway Noise Prediction Model (FHWA-RD-77-108) with California Vehicle Noise (CALVENO) Emission Levels.
Source of Traffic Volumes: RBF Consulting, September 29 2015
Community Noise Descriptor: L_{dn}: ____ CNEL: X

"-" = contour is located within the roadway right-of-way.
Distance is from the centerline of the roadway segment to the receptor location.

Assumed 24-Hour Traffic Distribution:	Day	Evening	Night
Total ADT Volumes	77.70%	12.70%	9.60%
Medium-Duty Trucks	87.43%	5.05%	7.52%
Heavy-Duty Trucks	89.10%	2.84%	8.06%

Analysis Condition Roadway, Segment	Lanes	Median Width	ADT Volume	Design Speed (mph)	Alpha Factor	Vehicle Mix: Medium Trucks	Vehicle Mix: Heavy Trucks	**Distance from Centerline of Roadway: CNEL at 50 Feet**	Distance to Contour: 70 CNEL	65 CNEL	60 CNEL	55 CNEL
Twin Oaks Valley Road												
North of Barham Dr. / Discovery St.	8	0	60,500	40	0.5	3.0%	2.0%	**77.9**	169	363	783	1,686
North of Barham Dr. / Discovery St. + Project	8	0	61,307	40	0.5	3.0%	2.0%	**78.0**	170	366	790	1,701
Barham Dr. / Discovery St. to Craven Rd.	6	0	53,100	40	0.5	3.0%	2.0%	**74.8**	105	226	486	1,047
Barham Dr. / Discovery St. to Craven Rd.+Project	6	0	53,821	40	0.5	3.0%	2.0%	**74.9**	106	228	490	1,056
Barham Drive												
Twin Oaks Valley Rd. to Campus Way	5	0	29,050	40	0.5	3.0%	2.0%	**71.6**	64	138	296	639
Twin Oaks Valley Rd. to Campus Way+Project	5	0	29,136	40	0.5	3.0%	2.0%	**71.6**	64	138	297	640
Campus Way to Industrial St.	5	0	28,850	40	0.5	3.0%	2.0%	**71.6**	64	137	295	636
Campus Way to Industrial St.+Project	5	0	29,228	40	0.5	3.0%	2.0%	**71.6**	64	138	298	641

Appendix C
Traffic Impact Analysis

TRAFFIC IMPACT ANALYSIS

CSUSM EXTENDED LEARNING BUILDING

San Marcos, California
March 21, 2016

LLG Ref. 3-15-2529

Prepared by:

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EXECUTIVE SUMMARY

Linscott, Law & Greenspan, Engineers (LLG) has prepared the following traffic impact study to determine and evaluate the potential impacts to the local roadway system due to the proposed CSUSM Extended Learning Building project. The project site is located in the City of San Marcos, on the California State University of San Marcos (CSUSM) campus.

The proposed CSUSM Extended Learning Building project site is approximately 52,300 SF, located in the southeastern portion of the CSUSM campus, east of Palm Canyon Drive, directly adjacent to the existing Foundation Classroom Building. The new structure is planned to include offices, meeting/conference rooms, classrooms, lecture halls, computer labs, science labs, research space and lab storage rooms among other amenities. The project is expected to serve approximately 715 additional Full Time Equivalent (FTE) students for credited programs. With the addition of these new students, the Project will accommodate a total of 1,655 FTE students. The proposed project is accessed by Palm Canyon Drive.

The project is calculated to generate 1,716 average daily traffic (ADT) with 172 trips during the AM peak hour (138 inbound and 34 outbound) and 154 trips during the PM peak hour (46 inbound and 108 outbound).

Based on SANTEC significance criteria and the level of service analyses, the project is not calculated to result in any significant impacts.

TABLE OF CONTENTS

APPENDICES

LIST OF FIGURES

LIST OF TABLES

1.0 INTRODUCTION

Linscott, Law & Greenspan Engineers (LLG) has prepared the following traffic impact study for with the proposed CSUSM Extended Learning Building project. The project site is located in the City of San Marcos, on the southeast portion of the California State University San Marcos campus.

The following items are included in this traffic study:

- Project Description
- Existing Conditions Discussion
- Analysis Approach and Methodology
- Significance Criteria
- Trip Generation/Distribution/Assignment
- Cumulative Projects Discussion
- Near-Term Analysis
- Conclusions

Figure 1–1 shows the vicinity map. ***Figure 1–2*** shows a more detailed project area map.

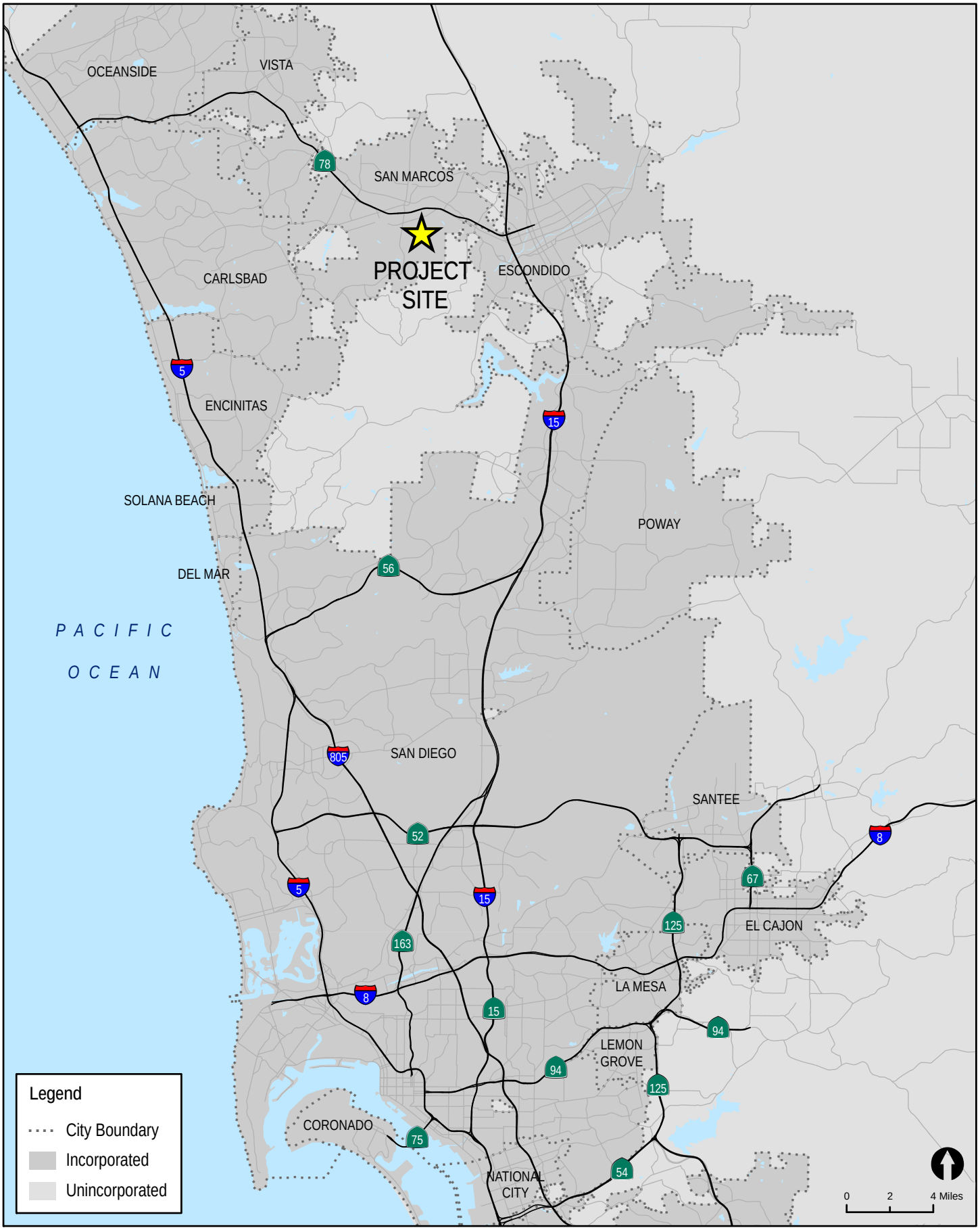

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Figure 1-1

Vicinity Map

CSUSM Extended Learning

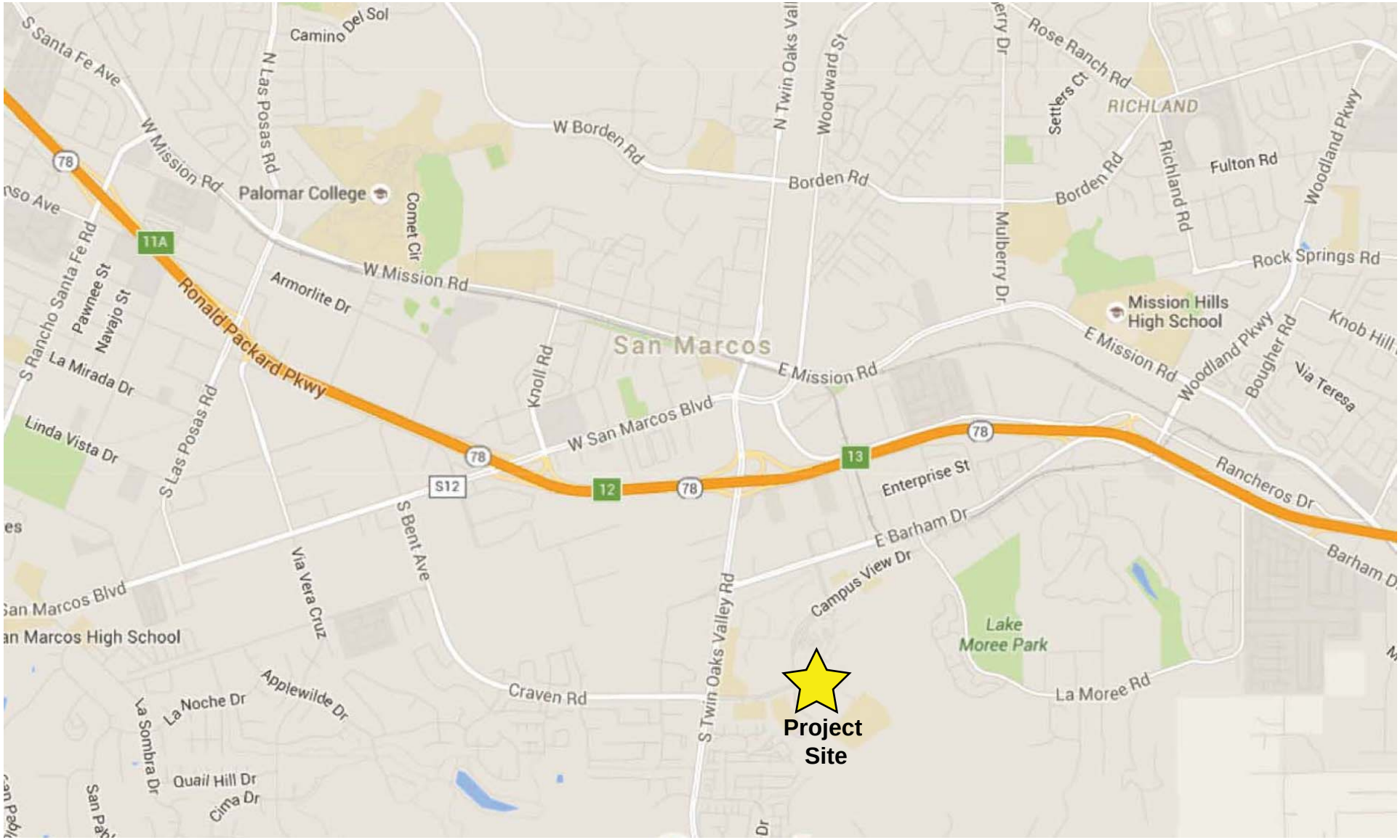

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Figure 1-2

Project Area Map

CSUSM Extended Learning

2.0 PROJECT DESCRIPTION

The proposed CSUSM Extended Learning Building project site is approximately 52,300 SF, located in the southeastern portion of the CSUSM campus, east of Palm Canyon Drive, directly adjacent to the existing Foundation Classroom Building. The new structure is planned to include offices, meeting/conference rooms, classrooms, lecture halls, computer labs, science labs, research space and lab storage rooms among other amenities. The project is expected to serve approximately 715 additional Full Time Equivalent (FTE) students for credited programs.

The FTE count was obtained from projections and existing student counts by CSUSM, as shown in ***Table 2–1***. Existing through Opening Day (2019) was reviewed and the net new students due to the project was calculated by subtracting the Existing student count from the projected Opening Day (2019) student count (i.e. 1,655 – 940 = 715).

The proposed project is accessed by Palm Canyon Drive within the campus. Offsite access is provided by Campus Way via Barham Drive and Craven Road via Twin Oaks Valley Road.

Figure 2–1 shows the project's conceptual site plan.

TABLE 2–1
PROJECTED STUDENT COUNTS

2015/2016 (Existing)	2016/2017	2017/2018	2018/2019 (Opening Day)
940	1,205	1,469	1,655

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Figure 2-1

Site Plan

CSUSM Extended Learning

3.0 EXISTING CONDITIONS

Effective evaluation of the traffic impacts associated with the proposed project requires an understanding of the existing transportation system within the project area. ***Figure 3–1*** shows an existing conditions diagram. The specific study area includes the following intersections and street segments based on the anticipated distribution of the project traffic and areas of potential impact:

Intersections

1. Barham Drive / Twin Oaks Valley Road
2. Barham Drive / Campus Way
3. Barham Drive / Industrial Street
4. Craven Road / Twin Oaks Valley Road

Street Segments

Twin Oaks Valley Road

- North of Barham Drive / Discovery Street
- Barham Drive / Discovery Street to Craven Road

Barham Drive

- Twin Oaks Valley Road to Campus Way
- Campus Way to Industrial Street

3.1 Existing Street Network

The principal roadways in the project study area are described briefly below. Roadway classifications were determined from a review of the *City of San Marcos Mobility Element* and information gathered from field observations. The following is a description of the existing street network in the study area.

Barham Drive is classified as a Prime Arterial from Twin Oaks Valley Road to Campus Way, as a Major Arterial between Campus Way and La Moree Road and as a Prime Arterial east of La Moree Road on the City of San Marcos Mobility Element. It is currently constructed as a 5-lane roadway with a raised median from Twin Oaks Valley Road to La Moree Road where it transitions to a four-lane roadway with a two-way left-turn lane. The posted speed limit in the study area is 35-45 mph, and curbside parking is generally prohibited. Bike lanes are provided. Bus stops are not provided.

Twin Oaks Valley Road is classified as a Prime Arterial on the City of San Marcos Mobility Element. Twin Oaks Valley Road is currently constructed as an 8-lane roadway with a raised median from the SR-78 Ramps to Barham Drive and as a 6-lane roadway with a raised median from Barham Drive to Craven Road. Bike lanes are provided, and curbside parking is generally prohibited. The posted speed limit is 45 mph.

3.2 Existing Traffic Volumes

Table 3–1 is a summary of the most recent available average daily traffic volumes (ADTs) from LLG counts conducted in October 2015 with the exception of one count conducted in April 2015. Counts at the study area intersections, including bicycle and pedestrian counts conducted between the hours of 7:00-9:00 AM and 4:00-6:00 PM, were obtained from previous studies in the project area including counts that were done in 2013. A growth factor of 4% was applied to the traffic volumes from 2013 based on growth trends seen from counts conducted in recent years around the area.

Figure 3–2 shows the Existing Traffic Volumes. ***Appendix A*** contains the manual count sheets.

TABLE 3–1
EXISTING TRAFFIC VOLUMES

Street Segment	ADT[a]	Date	Source
Twin Oaks Valley Road			
North of Barham Drive / Discovery Street	45,946	October 2015	LLG
Barham Drive / Discovery Street to Craven Street	32,796	October 2015	LLG
Barham Drive			
Twin Oaks Valley Road to Campus Way	18,209	October 2015	LLG
Campus Way to Industrial Street	17,606	April 2015	LLG

Footnotes:

a. Average Daily Traffic Volumes.

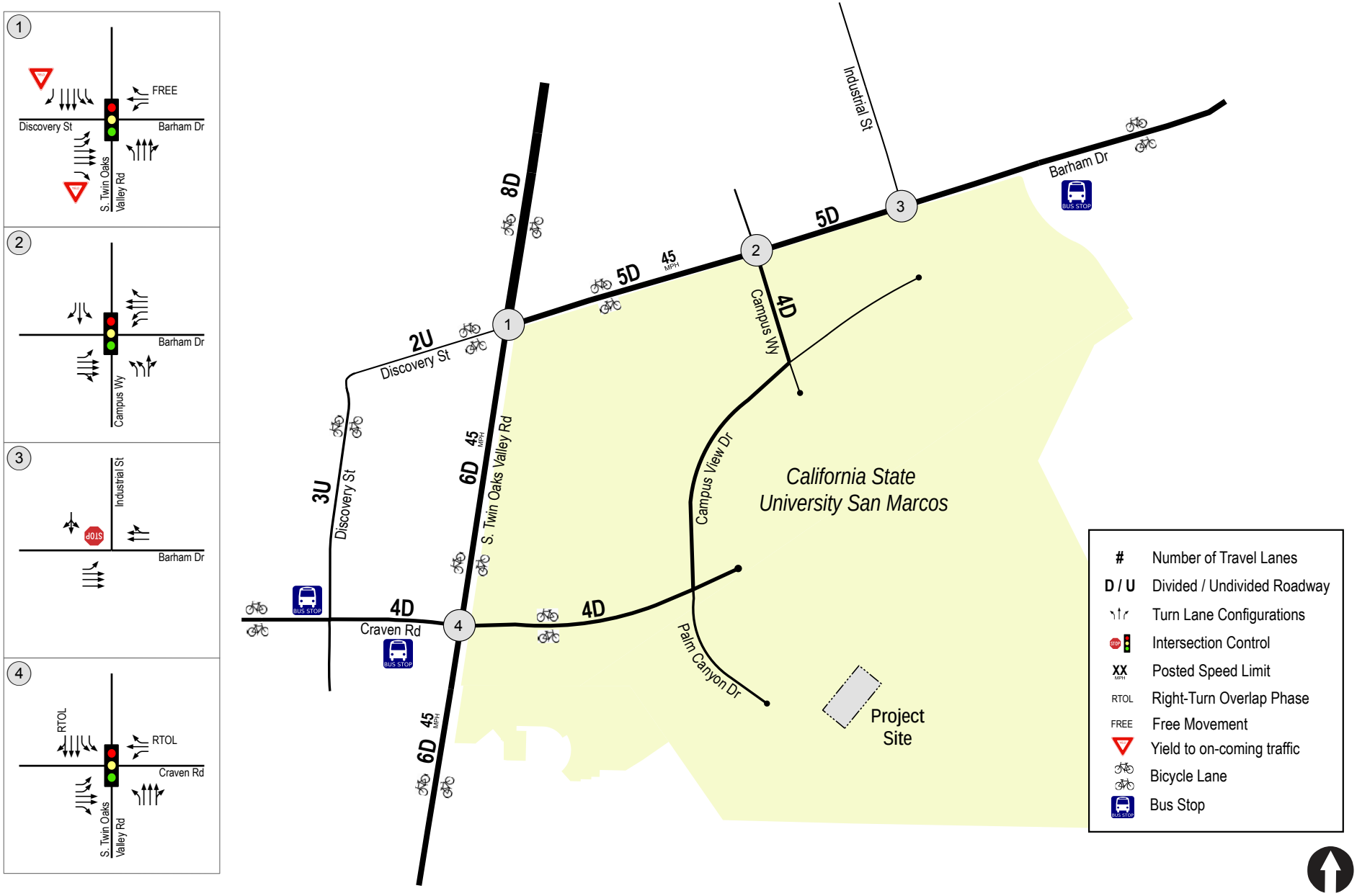

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Figure 3-1

Existing Conditions Diagram

CSUSM Extended Learning

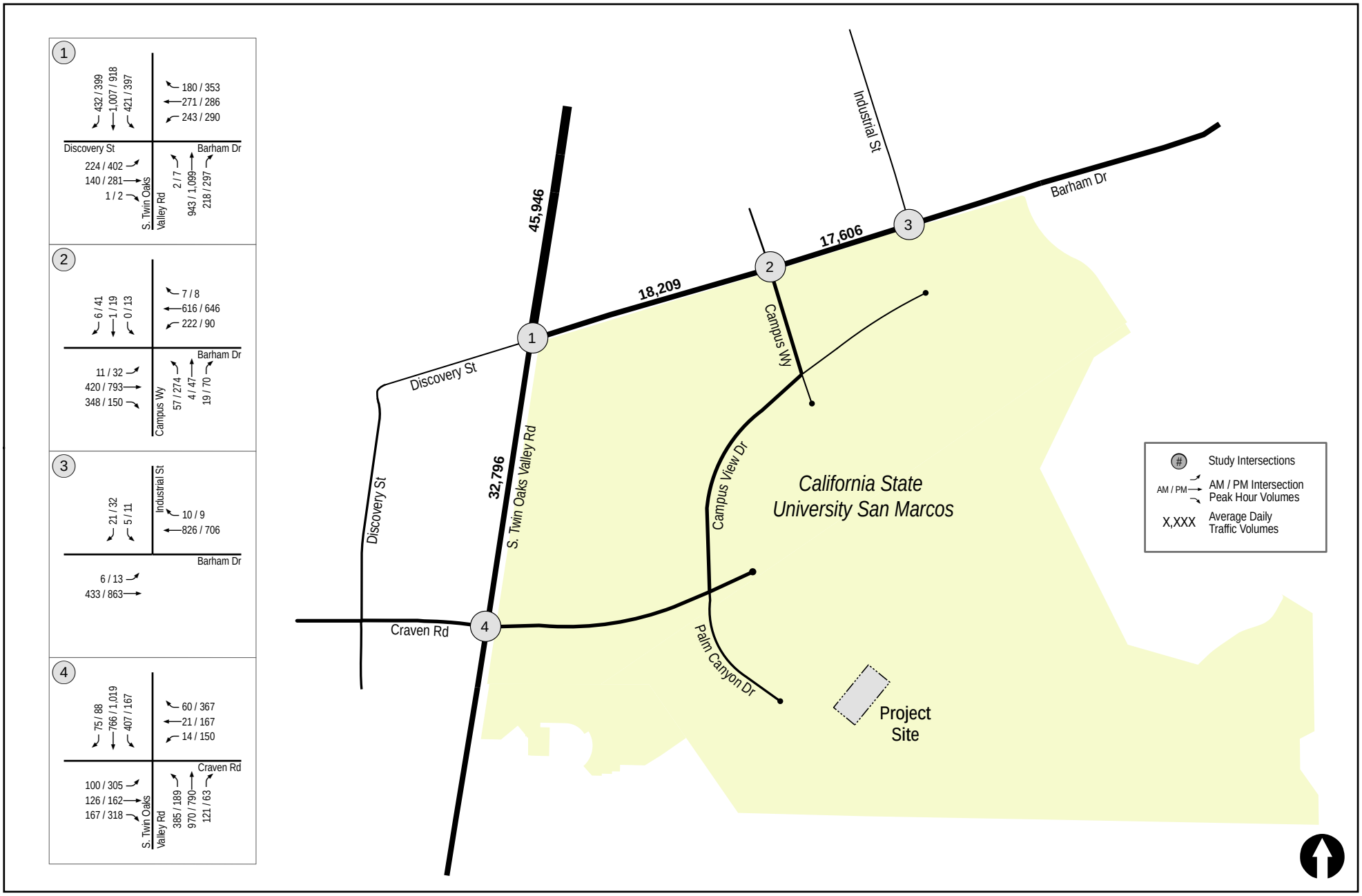

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Figure 3-2

Existing Traffic Volumes

CSUSM Extended Learning

4.0 ANALYSIS APPROACH AND METHODOLOGY

Level of service (LOS) is the term used to denote the different operating conditions which occur on a given roadway segment under various traffic volume loads. It is a qualitative measure used to describe a quantitative analysis taking into account factors such as roadway geometries, signal phasing, speed, travel delay, freedom to maneuver, and safety. Level of service provides an index to the operational qualities of a roadway segment or an intersection. Level of service designations range from A to F, with LOS A representing the best operating conditions and LOS F representing the worst operating conditions. Level of service designation is reported differently for signalized and unsignalized intersections, as well as for roadway segments.

4.1 Intersections

Signalized intersections were analyzed under AM and PM peak hour conditions. Average vehicle delay was determined utilizing the methodology found in Chapter 18 of the *2010 Highway Capacity Manual (HCM),* with the assistance of the *Synchro* (version 9) computer software. The delay values (represented in seconds) were qualified with a corresponding intersection Level of Service (LOS). A more detailed explanation of the methodology are attached in ***Appendix B***.

Unsignalized intersections were analyzed under AM and PM peak hour conditions. Average vehicle delay and Levels of Service (LOS) was determined based upon the procedures found in Chapter 19 and Chapter 20 of the *2010 Highway Capacity Manual (HCM)*, with the assistance of the *Synchro* (version 9) computer software. A more detailed explanation of the methodology are attached in ***Appendix B***.

4.2 Street Segments

Street segment analysis is based upon the comparison of daily traffic volumes (ADTs) to the City of San Marcos' *Roadway Classification, Level of Service, and ADT Table*. This table provides segment capacities for different street classifications, based on traffic volumes and roadway characteristics. The City of San Marcos' *Roadway Classification, Level of Service, and ADT Table* is attached in ***Appendix C***.

5.0 SIGNIFICANCE CRITERIA

A project is considered to have a significant impact if the new project traffic has decreased the operations of surrounding roadways by a defined threshold. The defined thresholds shown in ***Table 5–1*** below for roadway segments and intersections are based on San Diego Traffic Engineers' Council (SANTEC) significance criteria If the project exceeds the thresholds in *Table 5–1*, then the project may be considered to have a significant project impact. A feasible mitigation measure will need to be identified to return the impact within the thresholds (pre-project + allowable increase) or the impact will be considered significant and unmitigated.

TABLE 5–1
TRAFFIC IMPACT SIGNIFICANT THRESHOLDS

Level of Service with Project[a]	**Allowable Increase Due to Project Impacts[b]**		
	Roadway Segments		**Intersections**
	V/C	**Speed (mph)**	**Delay (sec.)**
D, E & F	0.02	1	2

Footnotes:

a. All level of service measurements are based upon HCM procedures for peak-hour conditions. However, V/C ratios for Roadway Segments may be estimated on an ADT/24-hour traffic volume basis (using Table 2 or a similar LOS chart for each jurisdiction). The acceptable LOS for roadways, and intersections is generally "D" ("C" for undeveloped or not densely developed locations per jurisdiction definitions).

b. If a proposed project's traffic causes the values shown in the table to be exceeded, the impacts are deemed to be significant. These impact changes may be measured from appropriate computer programs or expanded manual spreadsheets. The project applicant shall then identify feasible mitigations (within the Traffic Impact Study [TIS] report) that will maintain the traffic facility at an acceptable LOS. If the LOS with the proposed project becomes unacceptable (see note a above), the project applicant shall be responsible for mitigating significant impact changes.

General Notes:

1. V/C = Volume to Capacity Ratio
2. Speed = Arterial speed measured in miles per hour
3. Delay = Average stopped delay per vehicle measured in seconds for intersections, or minutes for ramp meters.
4. LOS = Level of Service

The impact is designated either a "direct" or "cumulative" impact.

"*Direct* traffic impacts are those projected to occur at the time a proposed development becomes operational, including other developments not presently operational but which are anticipated to be operational at that time (near term)."

"*Cumulative* traffic impacts are those projected to occur at some point after a proposed development becomes operational, such as during subsequent phases of a project and when additional proposed developments in the area become operational (short-term cumulative) or when affected community plan area reaches full planned buildout (long-term cumulative)."

For intersections and roadway segments affected by a project, level of service (LOS) D or better is considered acceptable under both direct and cumulative conditions."

If the project exceeds the thresholds in *Table 5–1*, then the project may be considered to have a significant "direct" or "cumulative" project impact. A significant impact can also occur if a project causes the Level of Service to degrade from D to E, even if the allowable increases in *Table 5–1* are not exceeded. A feasible mitigation measure will need to be identified to return the impact within SANTEC thresholds, or the impact will be considered significant and unmitigated.

6.0 ANALYSIS OF EXISTING CONDITIONS

6.1 Peak Hour Intersection Levels of Service

Table 6-1 summarizes the peak hour intersection operations under existing conditions. As seen in *Table 6-1,* all intersections are calculated to currently operate at LOS D or better during both the AM and PM peak hours.

Appendix D contains the Existing intersection analysis calculation worksheets.

6.2 Daily Street Segment Levels of Service

Table 6-2 summarizes the existing roadway segment operations. As seen in *Table 6-2,* the study area segments are calculated to currently operate at LOS C or better.

TABLE 6–1
EXISTING INTERSECTION OPERATIONS

Intersection	Control Type	Peak Hour	Existing	
			Delay[a]	LOS[b]
1. Barham Drive / Twin Oaks Valley Road	Signal	AM PM	34.0 46.6	C D
2. Barham Drive / Campus Way	Signal	AM PM	31.4 37.4	C D
3. Barham Drive / Industrial Street	OWSC [c]	AM PM	13.8 16.5	B C
4. Craven Road / Twin Oaks Valley Road	Signal	AM PM	32.4 40.7	C D

Footnotes:

a. Average delay expressed in seconds per vehicle.
b. Level of Service.
c. OWSC – One-Way Stop Controlled intersection. Minor street left turn delay is reported.

SIGNALIZED		UNSIGNALIZED	
DELAY/LOS THRESHOLDS		DELAY/LOS THRESHOLDS	
Delay	LOS	Delay	LOS
0.0 ≤ 10.0	A	0.0 ≤ 10.0	A
10.1 to 20.0	B	10.1 to 15.0	B
20.1 to 35.0	C	15.1 to 25.0	C
35.1 to 55.0	D	25.1 to 35.0	D
55.1 to 80.0	E	35.1 to 50.0	E
≥ 80.1	F	≥ 50.1	F

TABLE 6–2
EXISTING STREET SEGMENT OPERATIONS

Street Segment	Functional Classification	Capacity (LOS E) [a]	ADT [b]	LOS [c]	V/C [d]
Twin Oaks Valley Road					
North of Barham Dr. / Discovery St.	8-Lane Prime Arterial	70,000	45,946	C	0.656
Barham Dr. / Discovery St. to Craven Rd.	6-Lane Prime Arterial	60,000	32,796	B	0.547
Barham Drive					
Twin Oaks Valley Rd. to Campus Way	5-Lane Major Road	45,000	18,209	B	0.405
Campus Way to Industrial St.	5-Lane Major Road	45,000	17,606	B	0.391

Footnotes:

a. Capacities based on City of San Marcos' Roadway Classification Table.

b. Average Daily Traffic Volumes.

c. Level of Service.

d. Volume to Capacity.

7.0 TRIP GENERATION/DISTRIBUTION/ASSIGNMENT

7.1 Trip Generation

The trip generation rates for the CSUSM Extended Learning Building were obtained from SANDAG's *(Not So) Brief Guide of Vehicular Traffic Generation Rates for the San Diego Region, April 2002*. The standard university rate was utilized as it best reflects the proposed land use. The project is expected to serve approximately 715 additional Full Time Equivalent (FTE) students.

Table 7–1 tabulates the project traffic generation. The project is calculated to generate 1,716 ADT with 138 inbound / 34 outbound trips during the AM peak hour and 46 inbound / 108 outbound trips during the PM peak hour.

7.2 Trip Distribution/Assignment

The project traffic was distributed and assigned to the street system based on the project's proximity to state highways and arterials. ***Figure 7–1*** shows the project traffic distribution. ***Figure 7–2*** shows the project traffic volumes. ***Figure 7–3*** shows the Existing + Project traffic volumes.

TABLE 7–1
PROJECT TRIP GENERATION

Land Use	Size	Daily Trip Ends (ADTs)		AM Peak Hour					PM Peak Hour				
		Rate [a]	Volume	% of ADT	In:Out Split	Volume In	Volume Out	Volume Total	% of ADT	In:Out Split	Volume In	Volume Out	Volume Total
Extended Learning Building	715 FTE	2.4 /FTE	1,716	10%	80:20	138	34	172	9%	30:70	46	108	154
Total		**—**	**1,716**	**—**	**—**	**138**	**34**	**172**	**—**	**—**	**46**	**108**	**154**

Footnotes:

a. Rate is based on SANDAG's (Not So) Brief Guide of Vehicular Traffic Generation Rates for the San Diego Region, April 2002.

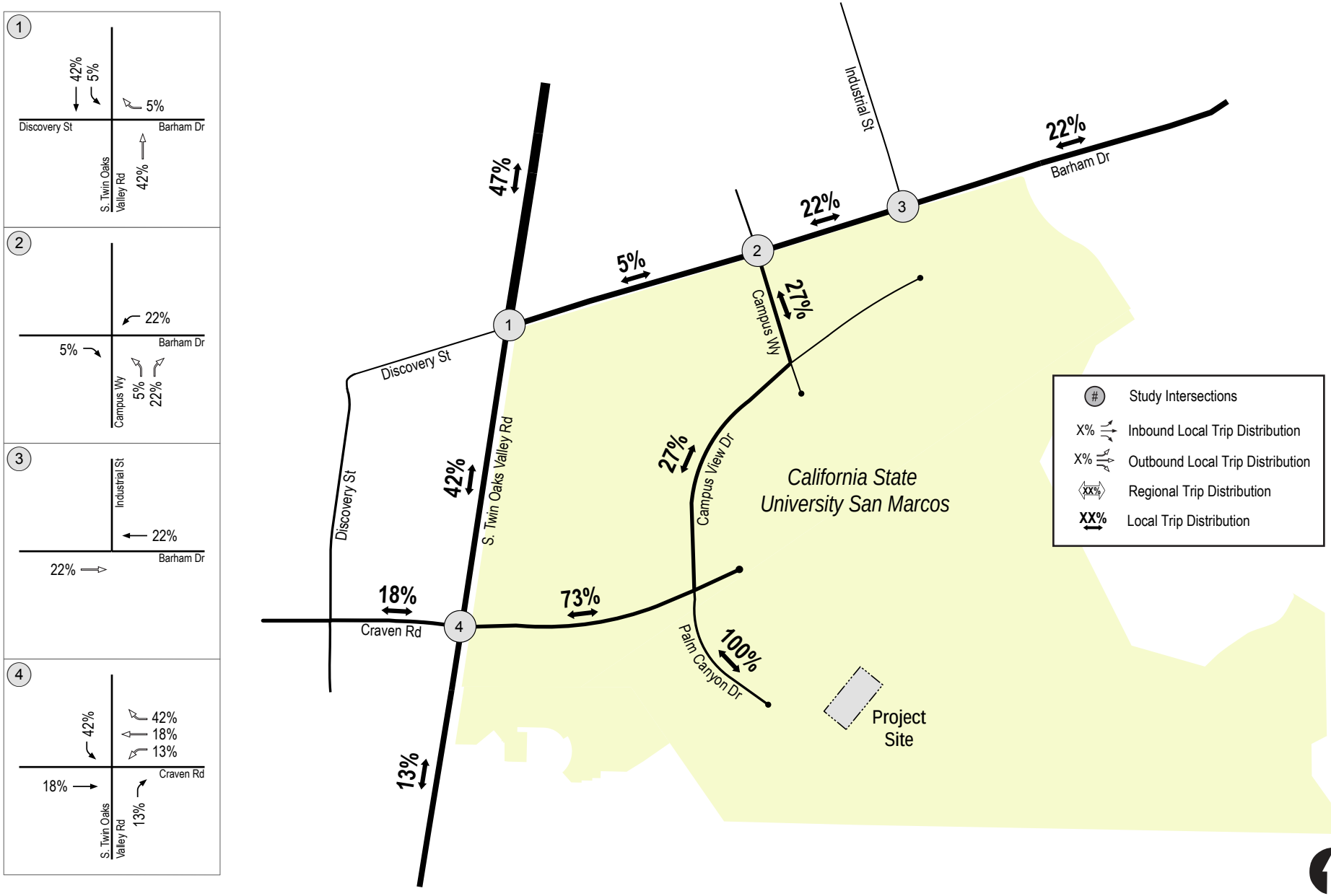

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Figure 7-1

Project Trip Distribution

CSUSM Extended Learning

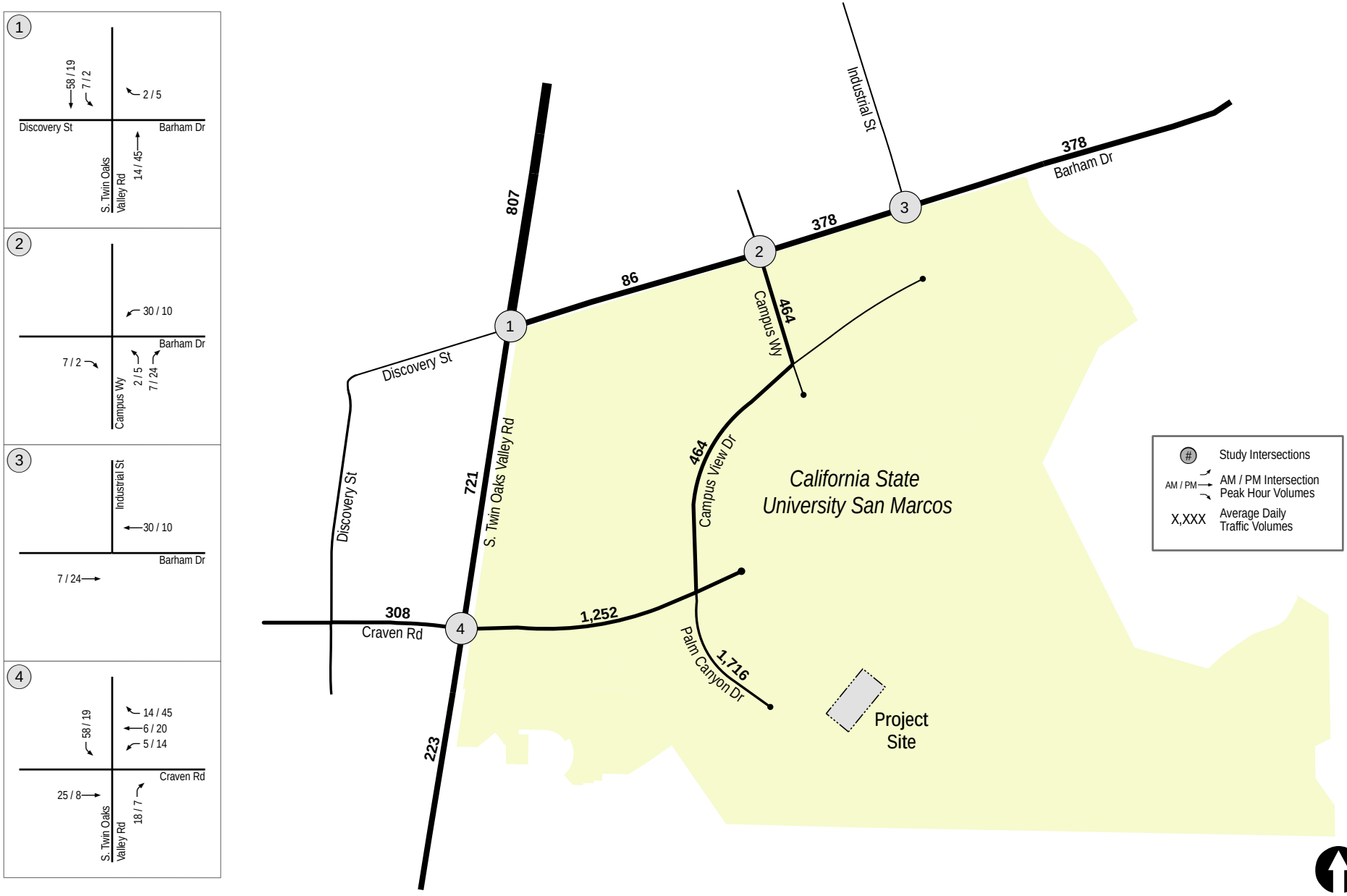

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Figure 7-2

Project Traffic Volumes

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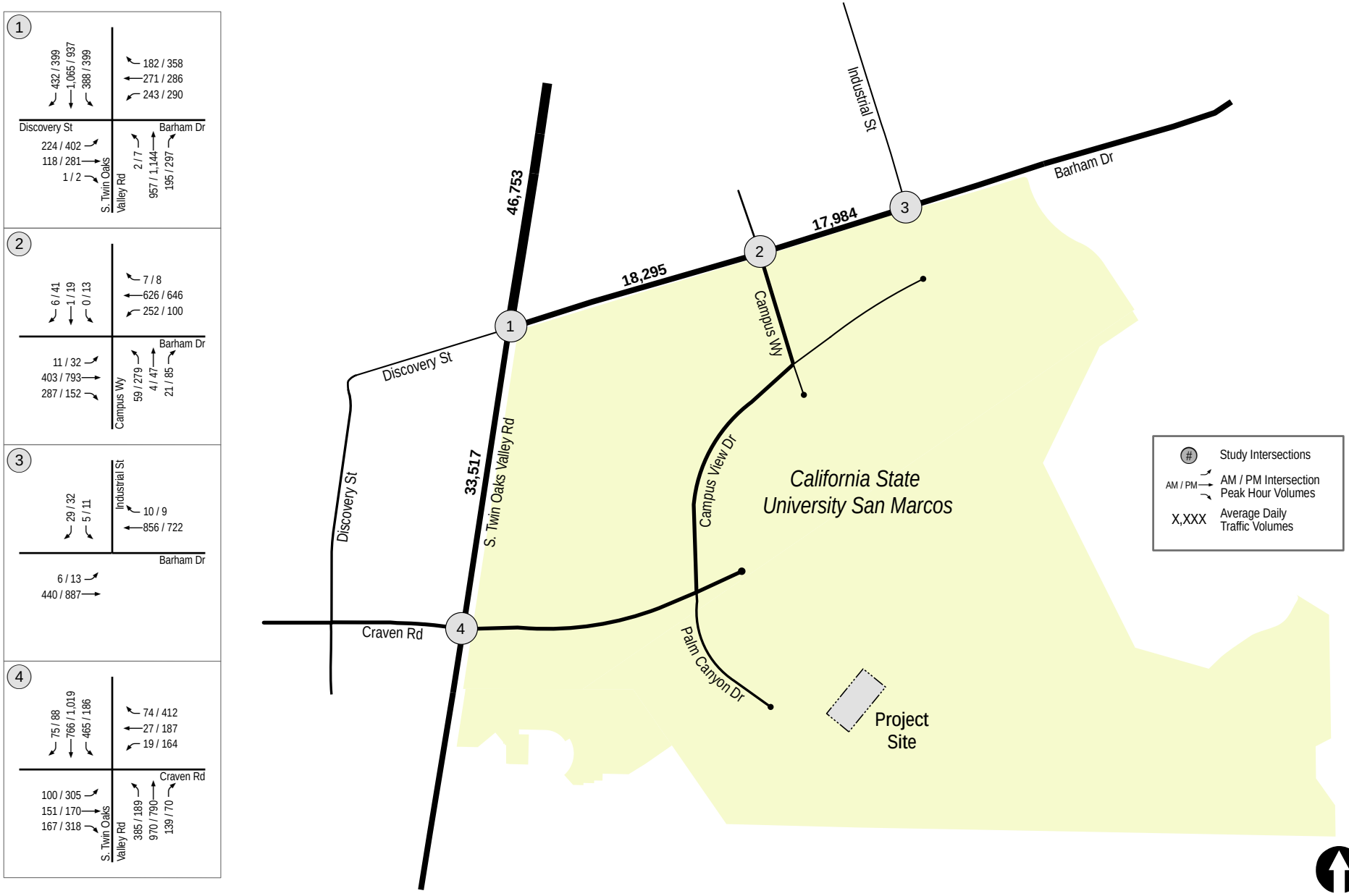

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Figure 7-3

Existing + Project Traffic Volumes

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8.0 EXISTING + PROJECT ANALYSIS

8.1.1 *Intersection Analysis*

Table 8–1 summarizes the intersection operations throughout the study area for the Existing + Project scenario. As seen in *Table 8–1*, with the addition of project traffic, all of the study intersections are calculated to continue to operate at LOS D or better.

Based on SANTEC significance criteria no significant impacts were identified under Existing + Project conditions.

Appendix E contains the Existing + Project intersection analysis calculation worksheets.

8.1.2 *Segment Operations*

Table 8–2 summarizes the segment operations throughout the study area for the Existing + Project scenario. As seen in *Table 8–2*, with the addition of project traffic, all of the study segments are calculated to continue to operate at LOS C or better.

Based on SANTEC significance criteria no significant impacts were identified under Existing + Project conditions.

TABLE 8–1
EXISTING + PROJECT INTERSECTION OPERATIONS

Intersection	Control Type	Peak Hour	Existing		Existing + Project		Δ [c]	Sig
			Delay[a]	LOS[b]	Delay	LOS		
1. Barham Drive / Twin Oaks Valley Road	Signal	AM PM	34.0 46.6	C D	34.2 48.1	C D	0.2 1.5	None
2. Barham Drive / Campus Way	Signal	AM PM	31.4 37.4	C D	32.4 37.9	C D	1.0 0.5	None
3. Barham Drive / Industrial Street	OWSC [d]	AM PM	13.8 16.5	B C	14.1 16.8	B C	0.3 1.3	None
4. Craven Road / Twin Oaks Valley Road	Signal	AM PM	32.4 40.7	C D	34.1 42.2	C D	1.7 1.5	None

Footnotes:
a. Average delay expressed in seconds per vehicle.
b. Level of Service.
c. Denotes increase in delay due to Project traffic.
d. OWSC – One-Way Stop Controlled intersection. Minor street left turn delay is reported.

SIGNALIZED		UNSIGNALIZED	
DELAY/LOS THRESHOLDS		DELAY/LOS THRESHOLDS	
Delay	LOS	Delay	LOS
0.0 ≤ 10.0	A	0.0 ≤ 10.0	A
10.1 to 20.0	B	10.1 to 15.0	B
20.1 to 35.0	C	15.1 to 25.0	C
35.1 to 55.0	D	25.1 to 35.0	D
55.1 to 80.0	E	35.1 to 50.0	E
≥ 80.1	F	≥ 50.1	F

TABLE 8–2
EXISTING + PROJECT STREET SEGMENT OPERATIONS

Street Segment	Capacity (LOS E) [a]	Existing			Existing + Project			Δ [e]	Sig
		ADT [b]	LOS [c]	V/C [d]	ADT	LOS	V/C		
Twin Oaks Valley Road									
North of Barham Dr. / Discovery St.	70,000	45,946	C	0.656	46,753	C	0.668	0.012	None
Barham Dr. / Discovery St. to Craven Rd.	60,000	32,796	B	0.547	33,517	B	0.559	0.012	None
Barham Drive									
Twin Oaks Valley Rd. to Campus Way	45,000	18,209	B	0.405	18,295	B	0.407	0.002	None
Campus Way to Industrial St.	45,000	17,606	B	0.391	17,984	B	0.400	0.009	None

Footnotes:

a. Capacities based on City of San Marcos' Roadway Classification Table.
b. Average Daily Traffic Volumes.
c. Level of Service.
d. Volume to Capacity.
e. Denotes increase in delay due to Project traffic.

9.0 CUMULATIVE PROJECTS

9.1 Description of Projects

Based on research at the City of San Marcos, the cumulative projects listed in ***Table 9–1*** were identified for inclusion in the traffic study.

Land use assumptions contained in the near-term SANDAG Series 11 North County Model within the project area were reviewed and the cumulative projects which were not already included in the model were added. In order to account for other unforeseen cumulative projects and regional traffic growth, traffic forecasts from the SANDAG Series 11 North County Model for the Years 2010 and 2020 were also utilized to forecast cumulative projects traffic volumes.

Table 9–1 shows the peak hour and ADT volumes generated by the cumulative projects.

Figure 9–1 shows the Existing + Cumulative Projects traffic volumes. ***Figure 9–2*** shows the Existing + Project + Cumulative Projects traffic volumes.

TABLE 9–1
CUMULATIVE PROJECTS TRIP GENERATION

Project		Land Use	Intensity	Unit	Daily Trips	AM Peak Hour			PM Peak Hour		
						Total	In	Out	Total	In	Out
1	Westlake Village	Apartments	105	DU	630	50	10	40	57	40	17
		Community Commercial	6.14	KSF	246	8	5	3	23	12	11
		Total Project Trips			***876***	***58***	***15***	***43***	***80***	***52***	***28***
2	Parkview Apartments	Apartments	81	DU	486	39	8	31	44	31	13
		Specialty Retail	4.5	KSF	180	5	3	2	16	8	8
		Total Project Trips			***666***	***44***	***11***	***33***	***60***	***39***	***21***
3	Palomar College Master Plan	Junior College	1,615	students	***711***	***50***	***45***	***5***	***57***	***20***	***37***
5	Marketplace at Twin Oaks	Standard Office	120	KSF	2,400	336	302	34	312	62	250
		Community Commercial	48.4	KSF	3,874	155	93	62	387	194	194
		Subtotal			6,274	491	395	96	699	256	443
		Trip Reductions (Pass-By, Transit, Internal Capture)			-1,262	-72	-53	-20	-164	-74	-90
		Total Project Trips			***5,012***	***419***	***342***	***76***	***535***	***182***	***353***
6	The Quad Housing – Private Development [a]	Community Commercial	40.353	KSF	3,228	129	77	52	323	161	161
		Student Housing	174	DU	1,044	84	17	67	94	66	28
		Total Project Trips			***4,272***	***213***	***94***	***119***	***417***	***227***	***189***
7	University District Block C	Multi-Family Apartments	196	DU	***1,176***	***94***	***19***	***75***	***106***	***74***	***32***
		Retail	11.5	KSF	***920***	***37***	***22***	***15***	***92***	***46***	***46***
		Total Project Trips			***2,096***	***131***	***41***	***90***	***198***	***120***	***78***

TABLE 9–1
CUMULATIVE PROJECTS TRIP GENERATION

8	University District Specific Plan[b]	Mixed Use Multi-Family DU	2470	DU	14,820	1,186	237	949	1,334	934	400
		Student Housing	433	DU	2,598	208	42	166	234	164	70
		Hotel	450	rooms	4,500	270	162	108	450	315	135
		Mixed use Community Commercial	660	KSF	52,800	2,112	1,267	845	5,280	2,640	2,640
		General Office	652	KSF	11,084	1,441	1,297	144	1,552	310	1,242
		Parks/Open Space	25	KSF	2	0	0	0	0	0	0
		Civic/Community	30	KSF	686	49	30	19	49	14	35
		Medical Office	300	KSF	15,000	900	720	180	1,650	495	1,155
		SubTotal			101,490	6,166	3,755	2,411	10,549	4,872	5,677
		Mixed Use Reduction (10%)			-10,149	-617	-376	-241	-1,055	-487	-568
		Transit Oriented Reduction (5%)			-4,567	-277	-169	-108	-475	-219	-255
		Total Project Trips			***86,774***	***5,272***	***3,211***	***2,061***	***9,019***	***4,166***	***4,854***
7	Campus Pointe II	Apartments	108	DU	648	52	10	41	58	41	17
		Specialty Retail	10	KSF	400	12	7	5	36	18	18
		Total Project Trips			***1,048***	***64***	***17***	***46***	***94***	***59***	***35***
8	Kaiser Permanente Master Plan	Medical Office	*70.7*	*KSF*	***3,533***	***212***	***170***	***42***	***389***	***117***	***272***
9	San Marcos Creek District Specific Plan[d]	Mixed Use Office	*80.754*	*KSF*	1,454	203	183	20	189	38	151
		Mixed use Community Commercial	*162.667*	*KSF*	11,712	468	281	187	1,171	586	586
		Mixed Use Multi-Family DU	*242*	*DU*	1,305	104	21	84	117	82	35
		Total Project Trips			***14,471***	***775***	***485***	***291***	***1,477***	***706***	***772***
10	Main Street Plaza[c]	Multi-Family DU	428	DU	2,568	205	41	164	231	162	69
		Community Commercial	72.216	KSF	5,777	231	139	92	578	289	289
		Standard Office	18.054	KSF	361	51	45	5	47	9	38
		Subtotal			8,706	487	225	261	856	460	396
		Mixed Use Reduction (10%)			-586	-51	-17	-34	-56	-34	-21
		Total Project Trips			***8,120***	***436***	***208***	***227***	***800***	***426***	***375***

TABLE 9–1
CUMULATIVE PROJECTS TRIP GENERATION

11	East Gate[c]	Apartments	42	DU	252	20	4	16	23	16	7
		Specialty Retail	11.285	KSF	451	14	8	6	41	21	20
		Total Project Trips			***703***	***34***	***12***	***22***	***64***	***37***	***27***
12	The Promenade at Creeekside[c]	Multi-Family Residential	98	DU	784	63	13	50	78	55	24
		Commercial Retail	21	KSF	840	25	15	10	76	38	38
		Restaurant	6	KSF	960	77	38	38	77	46	31
		Subtotal			2,584	165	66	98	231	139	93
		Mixed Use Reduction (10%)			-258	-16	-7	-10	-23	-14	-9
		Total Project Trips			***2,326***	***149***	***59***	***88***	***208***	***125***	***84***
13	South Lake Park	Regional Park	8	AC	***160***	***16***	***8***	***8***	***24***	***12***	***12***
14	San Elijo Hills	Single-Family DU (remainig units)	203	DU	***2,030***	***162***	***49***	***113***	***203***	***142***	***61***
15	Double Peak School	K-8 Elementary School	1,500	students	***2,400***	***798***	***461***	***307***	***216***	***86***	***130***
16	Pacific Commercial	Commercial Center	31.776	DU	***1,271***	***39***	***24***	***15***	***115***	***58***	***57***
17	Pacific Industrial	Industrial Building	22.16	KSF	***177***	***20***	***18***	***2***	***21***	***4***	***17***
18	Leigh Hanson Site	Single-Family Residential	346	DU	3,460	277	83	194	346	242	104
		Active Park	38.43	AC	1,153	150	75	75	104	52	52
		Business Park (MU-4 site)	216	KSF	3,456	415	332	83	415	83	332
		Specialty Retail (MU-4 site)	24	KSF	960	29	17	12	86	43	43
		Total Project Trips			***9,029***	***871***	***507***	***364***	***951***	***420***	***531***
19	San Marcos Highlands	Single-Family Residential	198	DU	***1,980***	***158***	***47***	***111***	***198***	***139***	***59***

TABLE 9–1
CUMULATIVE PROJECTS TRIP GENERATION

20	Palomar Station	Multi-Family Residential	370	DU	2,220	178	36	142	200	140	60
		Neighborhood Commercial	44.0	KSF	5,280	211	127	84	528	264	264
		Restaurant	5.0	KSF	800	8	5	3	64	38	26
		Live/Work Retail Spaces	5.4	KSF	216	6	4	3	19	10	10
		SubTotal			8,516	403	171	232	811	452	359
		Mixed Use Reduction (10%)			-852	-40	-17	-23	-81	-45	-36
		Transit Oriented Reduction (5%)			-426	-20	-9	-12	-41	-23	-18
		Net Project Trips			***7,239***	***343***	***145***	***197***	***690***	***384***	***305***
21	Davia Village	Multi-Family Residential	416	DU	2,496	200	40	160	225	158	67
		Commercial Retail	19.855	KSF	1,588	64	38	26	159	80	79
		Live/Work Retail Spaces	8.895	KSF	356	11	7	4	32	16	16
		Subtotal			4,440	275	85	190	416	254	162
		Mixed Use Reduction (10%)			-444	-28	-9	-19	-42	-25	-16
		Net Project Trips			***3,996***	***247***	***76***	***171***	***374***	***229***	***146***
22	Shane Park Plaza	Multi-Family Residential	19	DU	114	9	2	7	10	7	3
		Commercial Retail	6.138	KSF	491	20	12	8	49	25	24
		Total Project Trips			***605***	***29***	***14***	***15***	***59***	***32***	***27***
23	UK Investments, LLC	Multi-Family Residential	35	DU	***210***	***15***	***5***	***10***	***19***	***12***	***7***
24	El Dorado Specific Plan				***430***	***23***	***2***	***21***	***49***	***30***	***19***
25	Rancheros Drive DMV	Office	29.983	KSF	***5489***	***330***	***198***	***132***	***549***	***220***	***329***
26	Norman Project	Attached Condominiums	92	DU	***736***	***59***	***12***	***47***	***74***	***52***	***22***
27	Orlando Company	Single Family Residential	19	DU	***190***	***15***	***5***	***10***	***19***	***13***	***6***
28	San Marcos 13 Project	Single Family Residential	14	DU	***140***	***11***	***3***	***8***	***14***	***10***	***4***
29	Borden Road	Single Family Residential	22	DU	***220***	***18***	***5***	***13***	***22***	***15***	***7***
30	Kachay Homes	Single Family Residential	8	DU	***80***	***6***	***2***	***4***	***8***	***6***	***2***

TABLE 9–1
CUMULATIVE PROJECTS TRIP GENERATION

31	Heritage Ranch	Single Family Residential	16	DU	***160***	***13***	***4***	***9***	***16***	***11***	***5***
32	Richmar Park	Neighborhood Park	2.8	AC	***6***	***1***	***1***	***0***	***1***	***1***	***0***
33	Mulberry Project	Detached Condominiums	55	DU	440	35	7	28	44	31	13
		Attached Condominiums	71	DU	568	45	9	36	57	40	17
		Total Project Trips			***1,008***	***80***	***16***	***64***	***101***	***71***	***30***
34	City Ventures	Mixed-Use Townhomes	22	DU	***132***	***11***	***2***	***9***	***12***	***8***	***4***
35	Villa Serena	Apartments and Community Center	148	DU	***888***	***71***	***14***	***57***	***80***	***56***	***24***
36	Sandy Lanes Estates	Single Family Residential	9	DU	***54***	***4***	***1***	***3***	***5***	***4***	***1***
37	SJ Asset Management	Senior Housing	50	DU	***256***	***73***	***26***	***47***	***27***	***16***	***11***
Total					***168,783***	***11,220***	***6,310***	***4,875***	***17,188***	***8,287***	***8,904***

Footnotes:

a. The Quad Housing represents the first phase of the University District Specific Plan project.
b. It is estimated that by Year 2020, about 15% of the developments within the University District Specific Plan would be built in addition to the Quad Housing project, which is currently built.
c. Main Street Plaza, The Promenade at Creekside, and Eastgate represent the early phases of the Creek District Specific Plan.
d. It is estimated that by Year 2020, about 15% of the developments within the Creek District Specific Plan would be built in addition to Main Street Plaza, The Promenade at Creekside, and Eastgate.

General Notes:

1. DU = dwelling unit
2. KSF = 1,000 square feet

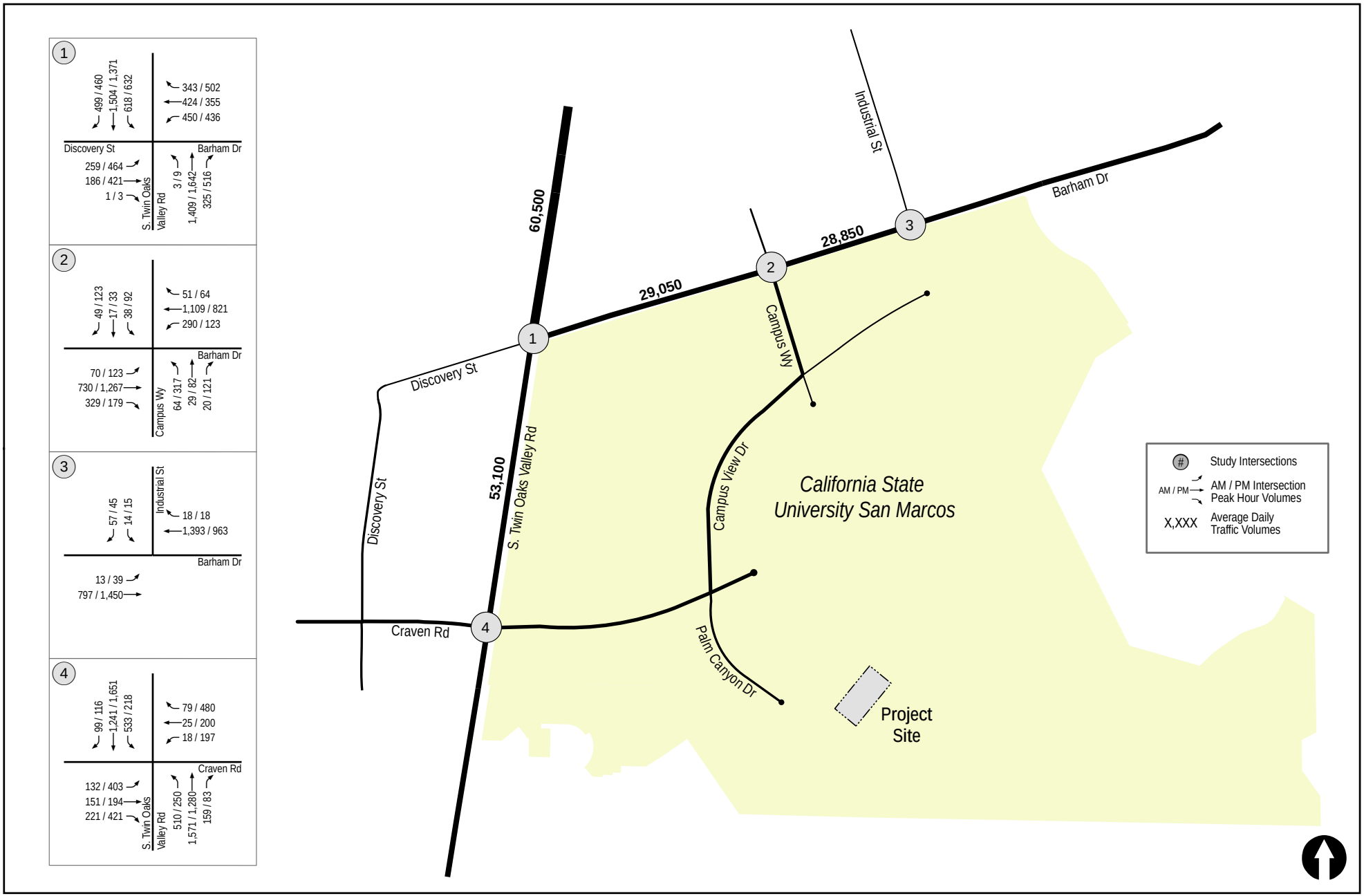

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Figure 9-1

Existing + Cumulative Projects Traffic Volumes

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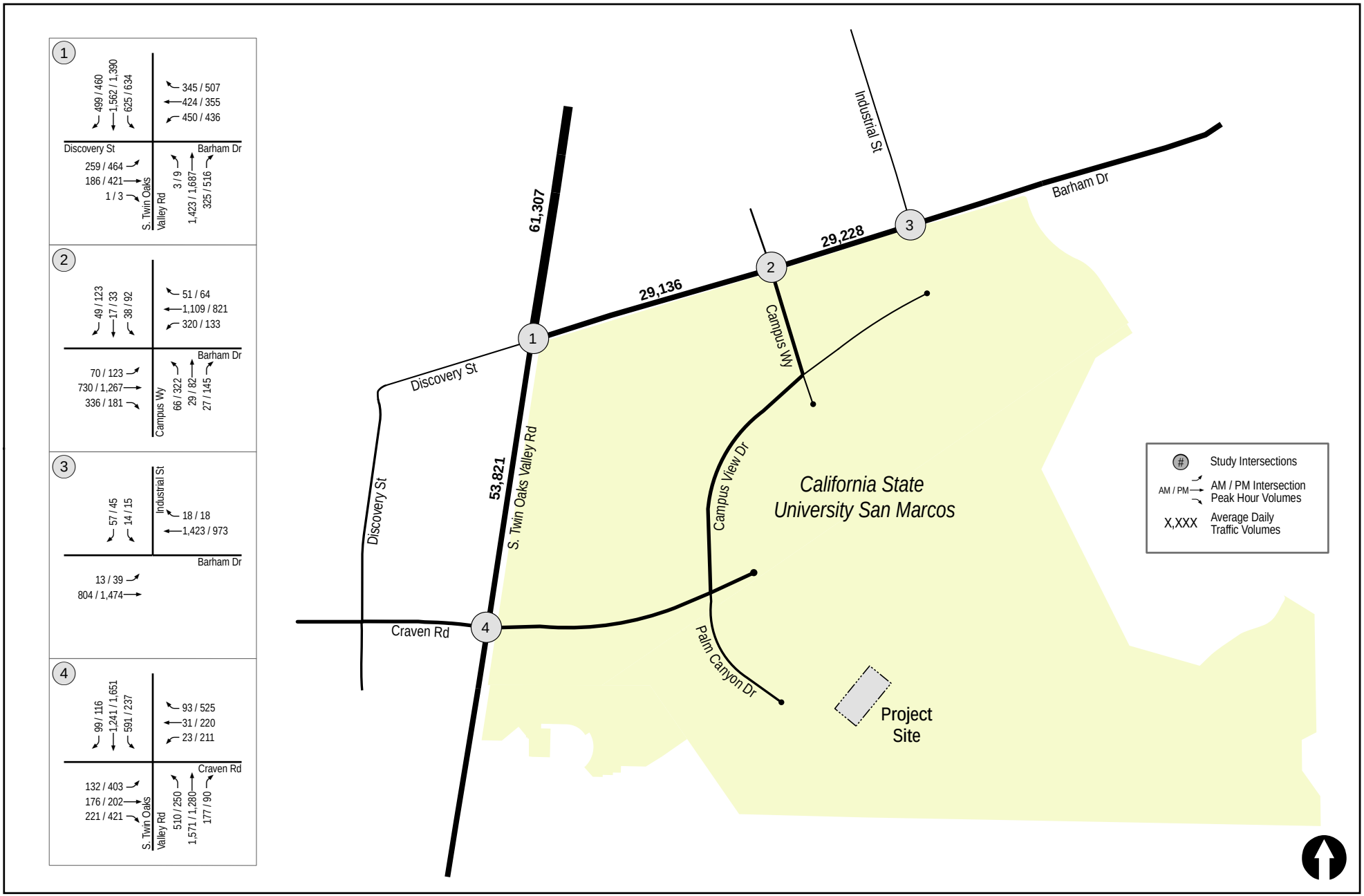

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Figure 9-2

Existing + Cumulative Projects + Project Traffic Volumes

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10.0 ANALYSIS OF NEAR-TERM SCENARIOS

10.1 Existing + Cumulative Projects

10.1.1 *Intersection Analysis*

Table 10–1 summarizes the intersection operations throughout the study area for the Existing + Cumulative Projects scenario. As seen in *Table 10–1*, all of the study intersections are calculated to operate at LOS D or better, except for the following:

- Barham Drive / Twin Oaks Valley Road (LOS F during the AM and PM peak hours).
- Craven Road / Twin Oaks Valley Road (LOS F during the PM peak hour).

Appendix F contains the Existing + Cumulative Projects intersection analysis calculation worksheets.

10.1.2 *Segment Operations*

Table 10–2 summarizes the segment operations throughout the study area for the Existing + Cumulative Projects scenario. As seen in *Table 10–2*, all of the study area segments are calculated to operate at LOS D or better.

10.2 Existing + Cumulative Projects + Project

10.2.1 *Intersection Analysis*

Table 10–1 summarizes the intersection operations throughout the study area for the Existing + Cumulative Projects + Project scenario. As seen in *Table 10–1*, with the addition of project traffic, the study area intersections are calculated to continue to operate at LOS D or better, except for the following:

- Barham Drive / Twin Oaks Valley Road (LOS F during the AM and PM peak hours).
- Craven Road / Twin Oaks Valley Road (LOS F during the PM peak hour).

Based on SANTEC significance criteria no significant impacts were identified under Existing + Cumulative Projects + Project conditions.

Appendix G contains the Existing + Cumulative Projects + Project intersection analyses calculation worksheets.

10.2.2 *Segment Operations*

Table 10–2 summarizes the segment operations throughout the study area for the Existing + Cumulative Projects + Project scenario. As seen in *Table 10–2*, with the addition of project traffic, all of the study area segments are calculated to continue to operate at LOS D or better, except for the following:

- Twin Oaks Valley Road: North of Barham Drive / Discovery Street

Based on SANTEC significance criteria no significant impacts were identified under Existing + Cumulative Projects + Project conditions.

TABLE 10–1
NEAR TERM INTERSECTION OPERATIONS

Intersection	Control Type	Peak Hour	Near Term		Near Term + Project		Δ [c]	Sig
			Delay[a]	LOS[b]	Delay	LOS		
1. Barham Drive / Twin Oaks Valley Road	Signal	AM	**127.3**	**F**	**129.1**	**F**	1.8	None
		PM	**167.9**	**F**	**169.3**	**F**	1.4	
2. Barham Drive / Campus Way	Signal	AM	44.4	D	45.4	D	1.0	None
		PM	53.3	D	54.5	D	1.2	
3. Barham Drive / Industrial Street	OWSC [d]	AM	33.3	D	35.1	D	1.8	None
		PM	33.4	D	34.8	D	1.4	
4. Craven Road / Twin Oaks Valley Road	Signal	AM	48.7	D	50.6	D	1.9	None
		PM	**95.6**	**F**	**97.2**	**F**	1.6	

Footnotes:

a. Average delay expressed in seconds per vehicle.
b. Level of Service.
c. Denotes increase in delay due to Project traffic.
d. OWSC – One-Way Stop Controlled intersection. Minor street left turn delay is reported.

SIGNALIZED		UNSIGNALIZED	
DELAY/LOS THRESHOLDS		DELAY/LOS THRESHOLDS	
Delay	LOS	Delay	LOS
0.0 ≤ 10.0	A	0.0 ≤ 10.0	A
10.1 to 20.0	B	10.1 to 15.0	B
20.1 to 35.0	C	15.1 to 25.0	C
35.1 to 55.0	D	25.1 to 35.0	D
55.1 to 80.0	E	35.1 to 50.0	E
≥ 80.1	F	≥ 50.1	F

TABLE 10–2
NEAR TERM STREET SEGMENT OPERATIONS

Street Segment	Capacity (LOS E) [a]	Near Term			Near Term + Project			Δ [e]	Sig
		ADT [b]	LOS [c]	V/C [d]	ADT	LOS	V/C		
Twin Oaks Valley Road									
North of Barham Dr. / Discovery St.	70,000	60,500	D	0.864	**61,307**	**E**	0.876	0.012	None
Barham Dr. / Discovery St. to Craven Rd.	60,000	53,100	D	0.885	53,821	D	0.897	0.012	None
Barham Drive									
Twin Oaks Valley Rd. to Campus Way	45,000	29,050	C	0.646	29,136	C	0.647	0.001	None
Campus Way to Industrial St.	45,000	28,850	C	0.641	29,228	C	0.650	0.009	None

Footnotes:

a. Capacities based on City of San Marcos' Roadway Classification Table.
b. Average Daily Traffic Volumes.
c. Level of Service.
d. Volume to Capacity.
e. Denotes increase in delay due to Project traffic.

11.0 CONCLUSIONS

Per SANTEC significance thresholds and the analysis methodology presented in this report, Project related traffic is not calculated to contribute to significant direct or cumulative impacts within the study area. Therefore, no mitigation measures are required.

APPENDIX A

INTERSECTION AND SEGMENT MANUAL COUNT SHEETS

Turn Count Summary

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

Location: E. Barham Drive @ S. Twin Oaks Valley Road

Date of Count: *Wednesday, April 17, 2013*

Analysts: *LV/CD*

Weather: *Sunny*

AVC Proj No: *13-0047*

Vehicular Count

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

Location: E. Barham Drive @ S. Twin Oaks Valley Road

AM Period (7:00 AM - 9:00 AM)													
	Southbound			Westbound			Northbound			Eastbound			
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	TOTAL
7:00 AM	42	198	51	30	27	35	0	213	40	43	19	0	698
7:15 AM	38	172	63	46	51	38	1	181	42	54	25	0	711
7:30 AM	65	175	78	76	68	41	0	236	60	57	26	0	882
7:45 AM	88	214	97	56	64	42	1	251	62	51	51	1	978
8:00 AM	112	287	101	49	60	47	0	203	48	43	28	0	978
8:15 AM	125	292	139	53	69	43	1	217	32	64	23	0	1,058
8:30 AM	88	229	87	43	74	48	1	185	23	62	28	0	868
8:45 AM	96	232	78	44	60	51	0	217	37	62	36	0	913
Total	654	1,799	694	397	473	345	4	1,703	344	436	236	1	7,086

AM Intersection Peak Hour : **7:30 AM - 8:30 AM** Intersection PHF : **0.92**

	Southbound			Westbound			Northbound			Eastbound			TOTAL
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
Volume	390	968	415	234	261	173	2	907	202	215	128	1	3,896
PHF	0.78	0.83	0.75	0.77	0.95	0.92	0.50	0.90	0.81	0.84	0.63	0.25	0.92
Movement PHF		0.80			0.90			0.88			0.83		0.92

PM Period (4:00 PM - 6:00 PM)													
	Southbound			Westbound			Northbound			Eastbound			
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	TOTAL
4:00 PM	57	171	88	54	40	75	0	243	84	96	58	0	966
4:15 PM	58	170	64	33	37	60	1	243	96	89	93	0	944
4:30 PM	64	174	64	41	50	70	1	215	77	110	87	1	954
4:45 PM	85	207	76	42	38	87	3	313	98	93	80	2	1,124
5:00 PM	84	201	83	56	46	91	1	213	59	103	88	0	1,025
5:15 PM	80	183	86	63	58	51	2	314	92	127	75	0	1,131
5:30 PM	125	292	139	53	69	43	1	217	32	64	23	0	1,058
5:45 PM	76	214	103	51	55	66	3	239	76	84	78	1	1,046
Total	629	1612	703	393	393	543	12	1,997	614	766	582	4	8,248

PM Intersection Peak Hour : **4:45 PM - 5:45 PM** Intersection PHF : **0.96**

	Southbound			Westbound			Northbound			Eastbound			TOTAL
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
Volume	374	883	384	214	211	272	7	1057	281	387	266	2	4338
PHF	0.75	0.756	0.691	0.849	0.764	0.747	0.583	0.842	0.717	0.762	0.756	0.25	0.96
Movement PHF		0.74			0.90			0.81			0.81		0.96

Turn Count Summary

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

Location: Barham Dr @ Campus Way

Date of Count: *Tuesday, April 28, 2015*

Analysts: *LV/CD*

Weather: *Sunny*

AVC Proj No: *15-0343*

Vehicular Count

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

Location: Barham Dr @ Campus Way

AM Period (7:00 AM - 9:00 AM)													
	Southbound			Westbound			Northbound			Eastbound			
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	TOTAL
7:00 AM	0	0	0	0	126	10	1	0	1	23	62	1	224
7:15 AM	3	0	0	2	160	31	1	0	7	53	99	1	357
7:30 AM	1	0	0	0	175	27	4	2	5	26	130	3	373
7:45 AM	2	3	0	1	206	33	12	1	7	62	90	6	423
8:00 AM	2	0	0	1	178	28	3	0	11	39	80	1	343
8:15 AM	1	0	0	4	165	32	2	0	5	45	88	6	348
8:30 AM	1	0	0	2	162	62	7	0	8	77	69	3	391
8:45 AM	2	1	0	0	100	100	2	4	33	119	77	1	439
Total	12	4	0	10	1,272	323	32	7	77	444	695	22	2,898

AM Intersection Peak Hour : **8:00 AM - 9:00 AM** Intersection PHF : **0.87**

	Southbound			Westbound			Northbound			Eastbound			TOTAL
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
Volume	6	1	0	7	605	222	14	4	57	280	314	11	1,521
PHF	0.75	0.25	#####	0.44	0.85	0.56	0.50	0.25	0.43	0.59	0.89	0.46	0.87
Movement PHF		0.58			0.92			0.48			0.77		0.87

PM Period (4:00 PM - 6:00 PM)													
	Southbound			Westbound			Northbound			Eastbound			
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	TOTAL
4:00 PM	7	1	3	3	106	7	23	6	62	25	152	5	400
4:15 PM	5	6	3	2	130	10	8	6	56	25	186	16	453
4:30 PM	9	3	6	5	103	9	12	8	47	31	191	4	428
4:45 PM	8	2	6	2	146	26	13	5	49	33	198	7	495
5:00 PM	12	6	3	3	132	19	14	12	49	34	175	8	467
5:15 PM	11	7	3	3	199	29	22	21	94	48	225	10	672
5:30 PM	10	4	1	0	169	16	12	9	82	35	195	7	540
5:45 PM	7	2	2	6	107	4	17	4	29	31	176	5	390
Total	69	31	27	24	1,092	120	121	71	468	262	1,498	62	3,845

PM Intersection Peak Hour : **4:45 PM - 5:45 PM** Intersection PHF : **0.81**

	Southbound			Westbound			Northbound			Eastbound			TOTAL
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
Volume	41	19	13	8	646	90	61	47	274	150	793	32	2174
PHF	0.85	0.679	0.542	0.667	0.812	0.776	0.693	0.56	0.729	0.781	0.881	0.8	0.81
Movement PHF		0.87			0.81			0.70			0.86		0.81

Turn Count Summary

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

Location: Barham Dr @ Industrial St

Date of Count: *Tuesday, April 28, 2015*

Analysts: *LV/CD*

Weather: *Sunny*

AVC Proj No: *15-0343*

LINSCOTT LAW & GREENSPAN engineers

Vehicular Count

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

AVC

Location: Barham Dr @ Industrial St

AM Period (7:00 AM - 9:00 AM)							
	Southbound		Westbound			Eastbound	
	Right	Left	Right	Thru		Thru	Left	TOTAL
7:00 AM	3	0	3	133		63	0	202
7:15 AM	6	2	3	187		98	3	299
7:30 AM	7	1	1	214		124	1	348
7:45 AM	2	0	3	211		121	1	338
8:00 AM	6	2	3	214		90	1	316
8:15 AM	5	3	4	201		81	1	295
8:30 AM	7	0	4	199		76	1	287
8:45 AM	6	1	2	184		84	5	282
Total	42	9	23	1,543		737	13	2,367

AM Intersection Peak Hour : **7:15 AM - 8:15 AM** Intersection PHF : **0.93**

	Southbound		Westbound			Eastbound		TOTAL
	Right	Left	Right	Thru		Thru	Left	
Volume	21	5	10	826		433	6	1,301
PHF	0.75	0.63	0.83	0.96		0.87	0.50	0.93
Movement PHF	0.81			0.96		0.88		0.93

PM Period (4:00 PM - 6:00 PM)							
	Southbound		Westbound			Eastbound	
	Right	Left	Right	Thru		Thru	Left	TOTAL
4:00 PM	12	2	1	104		185	6	310
4:15 PM	14	3	4	125		186	6	338
4:30 PM	3	1	3	120		201	0	328
4:45 PM	5	3	2	157		212	4	383
5:00 PM	10	6	2	145		189	2	354
5:15 PM	5	0	3	196		255	4	463
5:30 PM	12	2	2	168		207	3	394
5:45 PM	6	8	1	112		186	2	315
Total	67	25	18	1,127		1,621	27	2,885

PM Intersection Peak Hour : **4:45 PM - 5:45 PM** Intersection PHF : **0.86**

	Southbound		Westbound			Eastbound		TOTAL
	Right	Left	Right	Thru		Thru	Left	
Volume	32	11	9	666		863	13	1594
PHF	0.67	0.458	0.75	0.849		0.846	0.813	0.86
Movement PHF	0.67			0.85		0.85		0.86

Turn Count Summary

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

Location: Craven Road @ S. Twin Oaks Valley Road

Date of Count: *Wednesday, April 17, 2013*

Analysts: *LV/CD*

Weather: *Sunny*

AVC Proj No: *13-0047*

LINSCOTT LAW & GREENSPAN engineers

Vehicular Count

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

AVC

Location: Craven Road @ S. Twin Oaks Valley Road

AM Period (7:00 AM - 9:00 AM)													
	Southbound			Westbound			Northbound			Eastbound			
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	TOTAL
7:00 AM	36	176	7	0	2	4	35	203	7	20	11	30	531
7:15 AM	35	181	9	0	0	3	59	225	0	18	15	49	594
7:30 AM	45	202	18	5	1	6	105	257	11	25	14	91	780
7:45 AM	95	185	15	0	3	12	94	269	30	26	21	25	775
8:00 AM	128	160	18	4	5	13	97	199	28	23	44	29	748
8:15 AM	123	190	21	4	11	27	74	208	47	22	42	16	785
8:30 AM	117	131	28	7	3	7	92	175	27	28	23	31	669
8:45 AM	108	132	25	8	13	22	45	184	38	28	37	32	672
Total	687	1,357	141	28	38	94	601	1,720	188	190	207	303	5,554

AM Intersection Peak Hour : **7:30 AM - 8:30 AM** Intersection PHF : **0.98**

	Southbound			Westbound			Northbound			Eastbound			TOTAL
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
Volume	391	737	72	13	20	58	370	933	116	96	121	161	3,088
PHF	0.76	0.91	0.86	0.65	0.45	0.54	0.88	0.87	0.62	0.92	0.69	0.44	0.98
Movement PHF		0.90			0.54			0.90			0.73		0.98

PM Period (4:00 PM - 6:00 PM)													
	Southbound			Westbound			Northbound			Eastbound			
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	TOTAL
4:00 PM	28	183	28	10	23	40	35	219	11	57	27	45	706
4:15 PM	27	157	18	22	13	51	45	191	16	66	38	60	704
4:30 PM	40	178	11	23	26	47	42	200	20	92	33	58	770
4:45 PM	42	236	22	37	25	81	41	176	16	76	38	68	858
5:00 PM	44	273	27	49	47	110	37	174	14	71	36	75	957
5:15 PM	41	225	15	35	57	106	58	216	18	73	53	82	979
5:30 PM	34	246	21	23	32	56	46	194	13	73	29	81	848
5:45 PM	33	267	31	22	21	43	45	179	20	65	34	81	841
Total	289	1765	173	221	244	534	349	1,549	128	573	288	550	6,663

PM Intersection Peak Hour : **4:45 PM - 5:45 PM** Intersection PHF : **0.93**

	Southbound			Westbound			Northbound			Eastbound			TOTAL
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
Volume	161	980	85	144	161	353	182	760	61	293	156	306	3642
PHF	0.91	0.897	0.787	0.735	0.706	0.802	0.784	0.88	0.847	0.964	0.736	0.933	0.93
Movement PHF		0.89			0.80			0.86			0.91		0.93

24 Hour Segment Count

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

Location: 1. Twin Oaks Valley Rd: SR-78 EB Ramps to Barham Dr

Orientation: *North-South*

Date of Count: *Wednesday, October 07, 2015*

Analysts: *DASH*

Weather: *Sunny*

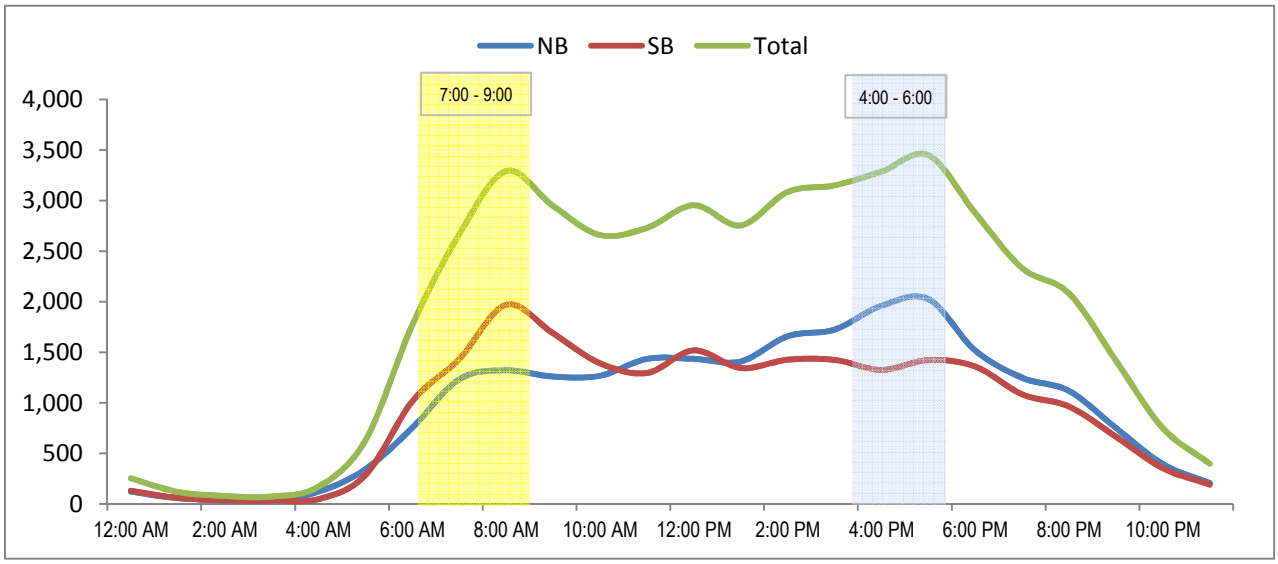
AVC Proj. No: *15-0421*

24 Hour Segment Volume			45,946

Time	Hourly Volume		
	NB	SB	Total
12:00 AM - 1:00 AM	123	132	255
1:00 AM - 2:00 AM	58	61	119
2:00 AM - 3:00 AM	43	37	80
3:00 AM - 4:00 AM	39	35	74
4:00 AM - 5:00 AM	122	49	171
5:00 AM - 6:00 AM	344	286	630
6:00 AM - 7:00 AM	754	1,016	1,770
7:00 AM - 8:00 AM	1,234	1,433	2,667
8:00 AM - 9:00 AM	1,322	1,970	3,292
9:00 AM - 10:00 AM	1,260	1,688	2,948
10:00 AM - 11:00 AM	1,268	1,392	2,660
11:00 AM - 12:00 PM	1,435	1,296	2731
Total	**8,002**	**9,395**	**17,397**

Time	Hourly Volume		
	NB	SB	Total
12:00 PM - 1:00 PM	1,436	1,519	2,955
1:00 PM - 2:00 PM	1,410	1,345	2,755
2:00 PM - 3:00 PM	1,659	1,427	3,086
3:00 PM - 4:00 PM	1,725	1,426	3,151
4:00 PM - 5:00 PM	1,960	1,327	3,287
5:00 PM - 6:00 PM	2,027	1,423	3,450
6:00 PM - 7:00 PM	1,519	1,360	2,879
7:00 PM - 8:00 PM	1,249	1,085	2,334
8:00 PM - 9:00 PM	1,119	964	2,083
9:00 PM - 10:00 PM	753	666	1,419
10:00 PM - 11:00 PM	396	355	751
11:00 PM - 12:00 AM	207	192	399
Total	**15,460**	**13,089**	**28,549**

24-Hour NB Volume	23,462	24-Hour SB Volume	22,484



24 Hour Segment Count

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

Location: 2. Twin Oaks Valley Rd: Barham Dr to Craven Rd

Orientation: *North-South*

Date of Count: *Wednesday, October 07, 2015*

Analysts: *DASH*

Weather: *Sunny*

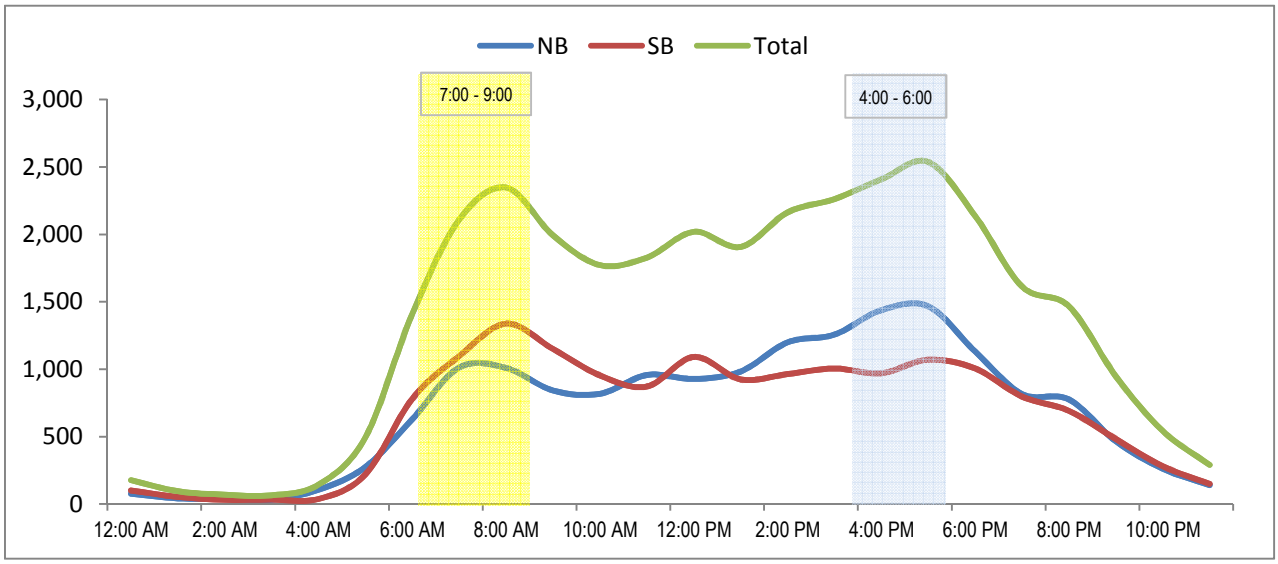
AVC Proj. No: *15-0421*

24 Hour Segment Volume			32,796

Time	Hourly Volume		
	NB	SB	Total
12:00 AM - 1:00 AM	76	101	177
1:00 AM - 2:00 AM	42	53	95
2:00 AM - 3:00 AM	39	31	70
3:00 AM - 4:00 AM	32	33	65
4:00 AM - 5:00 AM	106	38	144
5:00 AM - 6:00 AM	275	220	495
6:00 AM - 7:00 AM	630	781	1,411
7:00 AM - 8:00 AM	1,013	1,097	2,110
8:00 AM - 9:00 AM	1,009	1,338	2,347
9:00 AM - 10:00 AM	842	1,150	1,992
10:00 AM - 11:00 AM	818	954	1,772
11:00 AM - 12:00 PM	957	871	1828
Total	**5,839**	**6,667**	**12,506**

Time	Hourly Volume		
	NB	SB	Total
12:00 PM - 1:00 PM	928	1,091	2,019
1:00 PM - 2:00 PM	983	924	1,907
2:00 PM - 3:00 PM	1,199	964	2,163
3:00 PM - 4:00 PM	1,257	1,005	2,262
4:00 PM - 5:00 PM	1,438	970	2,408
5:00 PM - 6:00 PM	1,466	1,071	2,537
6:00 PM - 7:00 PM	1,131	1,005	2,136
7:00 PM - 8:00 PM	816	797	1,613
8:00 PM - 9:00 PM	775	691	1,466
9:00 PM - 10:00 PM	465	482	947
10:00 PM - 11:00 PM	262	280	542
11:00 PM - 12:00 AM	140	150	290
Total	**10,860**	**9,430**	**20,290**

24-Hour NB Volume	16,699	24-Hour SB Volume	16,097



24 Hour Segment Count

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

Location: 3. Barham Dr: Twin Oaks Valley Rd to Campus Way

Orientation: *North-South*

Date of Count: *Wednesday, October 07, 2015*

Analysts: *DASH*

Weather: *Sunny*

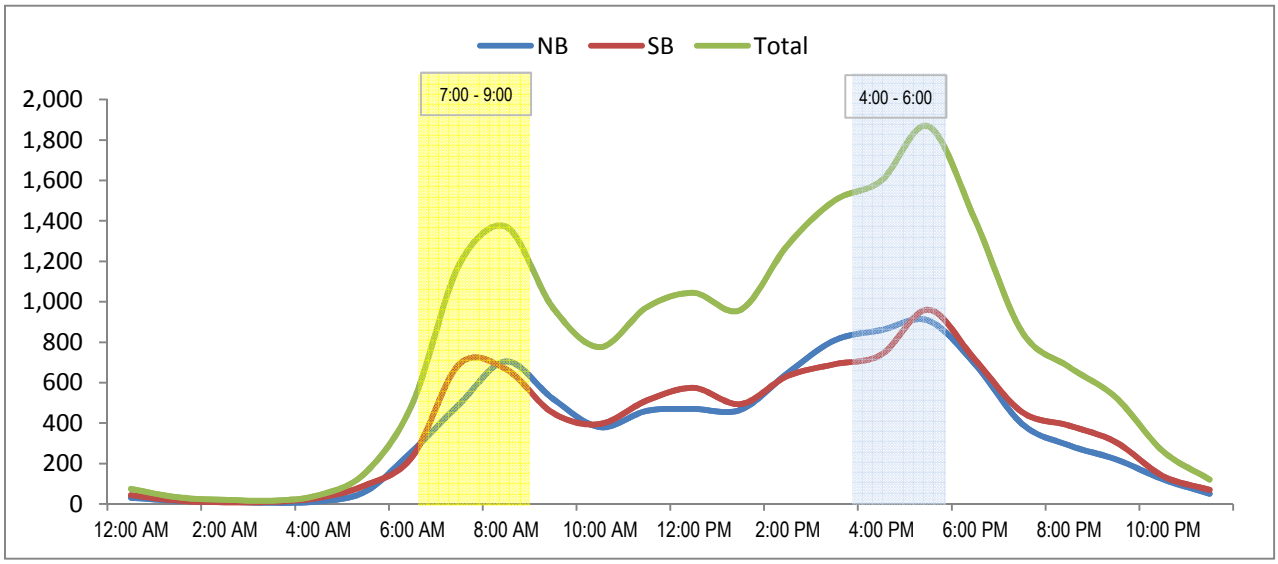
AVC Proj. No: *15-0421*

24 Hour Segment Volume			18,209

Time	Hourly Volume		
	NB	SB	Total
12:00 AM - 1:00 AM	31	44	75
1:00 AM - 2:00 AM	16	17	33
2:00 AM - 3:00 AM	12	9	21
3:00 AM - 4:00 AM	6	11	17
4:00 AM - 5:00 AM	13	31	44
5:00 AM - 6:00 AM	62	93	155
6:00 AM - 7:00 AM	262	234	496
7:00 AM - 8:00 AM	493	691	1,184
8:00 AM - 9:00 AM	705	666	1,371
9:00 AM - 10:00 AM	520	450	970
10:00 AM - 11:00 AM	380	396	776
11:00 AM - 12:00 PM	461	512	973
Total	**2,961**	**3,154**	**6,115**

Time	Hourly Volume		
	NB	SB	Total
12:00 PM - 1:00 PM	470	574	1,044
1:00 PM - 2:00 PM	466	494	960
2:00 PM - 3:00 PM	647	633	1,280
3:00 PM - 4:00 PM	809	691	1,500
4:00 PM - 5:00 PM	860	739	1,599
5:00 PM - 6:00 PM	907	961	1,868
6:00 PM - 7:00 PM	691	713	1,404
7:00 PM - 8:00 PM	396	455	851
8:00 PM - 9:00 PM	290	388	678
9:00 PM - 10:00 PM	221	306	527
10:00 PM - 11:00 PM	123	139	262
11:00 PM - 12:00 AM	51	70	121
Total	**5,931**	**6,163**	**12,094**

24-Hour NB Volume	8,892	24-Hour SB Volume	9,317



24 Hour Segment Count

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

Location: c. Barham Dr, N. Twin Oaks Valley Rd to Industrial St

Orientation: *East-West*

Date of Count: *Tuesday, April 28, 2015*

Analysts: *DASH*

Weather: *Sunny*

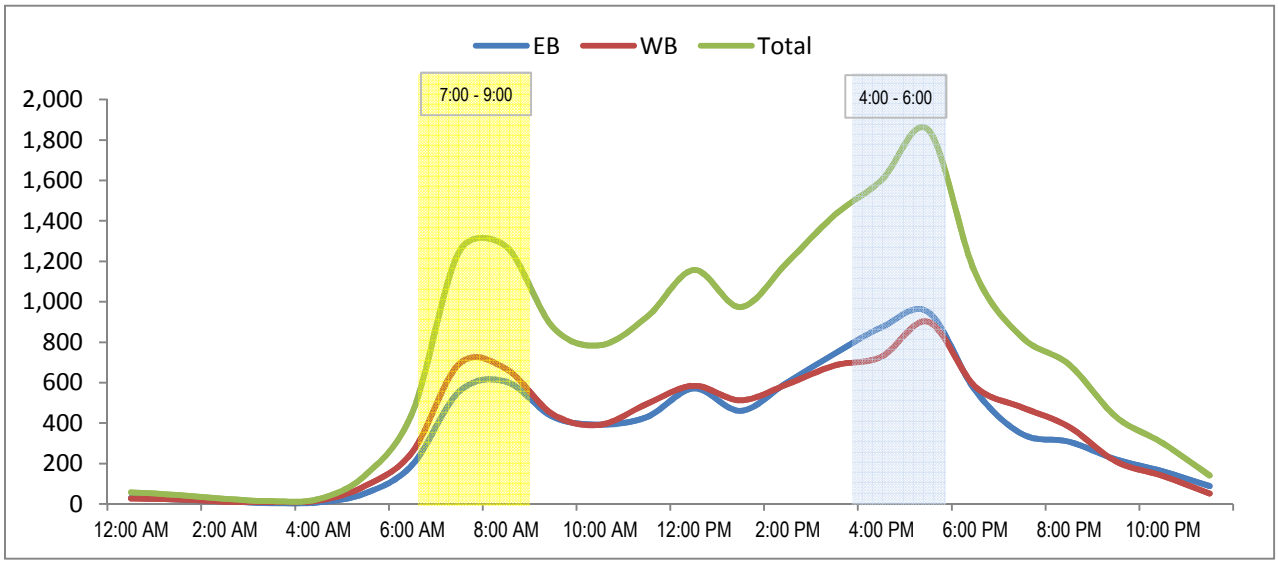
AVC Proj. No: *15-0343*

24 Hour Segment Volume			*17,606*

Time	Hourly Volume		
	EB	WB	Total
12:00 AM - 1:00 AM	30	28	58
1:00 AM - 2:00 AM	22	23	45
2:00 AM - 3:00 AM	14	12	26
3:00 AM - 4:00 AM	4	10	14
4:00 AM - 5:00 AM	8	17	25
5:00 AM - 6:00 AM	53	90	143
6:00 AM - 7:00 AM	194	258	452
7:00 AM - 8:00 AM	556	693	1,249
8:00 AM - 9:00 AM	605	668	1,273
9:00 AM - 10:00 AM	431	443	874
10:00 AM - 11:00 AM	393	392	785
11:00 AM - 12:00 PM	430	495	925
Total	**2,740**	**3,129**	**5,869**

Time	Hourly Volume		
	EB	WB	Total
12:00 PM - 1:00 PM	572	585	1,157
1:00 PM - 2:00 PM	461	513	974
2:00 PM - 3:00 PM	603	593	1,196
3:00 PM - 4:00 PM	743	685	1,428
4:00 PM - 5:00 PM	873	728	1,601
5:00 PM - 6:00 PM	949	901	1,850
6:00 PM - 7:00 PM	562	581	1,143
7:00 PM - 8:00 PM	346	478	824
8:00 PM - 9:00 PM	308	382	690
9:00 PM - 10:00 PM	221	211	432
10:00 PM - 11:00 PM	162	139	301
11:00 PM - 12:00 AM	89	52	141
Total	**5,889**	**5,848**	**11,737**

24-Hour	*EB*	*Volume*	*8,629*	*24-Hour*	*WB*	*Volume*	*8,977*



APPENDIX B

INTERSECTION METHODOLOGY AND ANALYSIS SHEETS

2010 HIGHWAY CAPACITY MANUAL LEVEL OF SERVICE CRITERIA FOR SIGNALIZED INTERSECTIONS

In the 2010 Highway Capacity Manual (HCM), Level of Service for signalized intersections is defined in terms of delay. Delay is a measure of driver discomfort, frustration, fuel consumption, and lost travel time. Specifically, Level of Service criteria are stated in terms of the average control delay per vehicle for a 15-minute analysis period. Control delay includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay.

Delay is a complex measure, and is dependent on a number of variables, including the quality of progression, the cycle length, the green ratio, and the v/c ratio for the lane group or approach in question.

LEVEL OF SERVICE	CONTROLLED DELAY PER VEHICLE (SEC)		
A		≤	10.0
B	10.1	to	20.0
C	20.1	to	35.0
D	35.1	to	55.0
E	55.1	to	80.0
F		>	80.0

Level of Service A describes operations with very low delay, (i.e. less than 10.0 seconds per vehicle). This occurs when progression is extremely favorable, and most vehicles arrive during the green phase. Most vehicles do not stop at all. Short cycle lengths may also contribute to low delay.

Level of Service B describes operations with delay in the range of 10.1 to 20.0 seconds per vehicle. This generally occurs with good progression and/or short cycle lengths. More vehicles stop than for LOS A, causing higher levels of average delay.

Level of Service C describes operations with delay in the range of 20.1 to 35.0 seconds per vehicle. These higher delays may result from fair progression and/or longer cycle lengths. Individual cycle failures may begin to appear in the level. The number of vehicles stopping is significant at this level, although many still pass through the intersections without stopping.

Level of Service D describes operations with delay in the range of 35.1 to 55.0 seconds per vehicle. At Level D, the influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high v/c ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.

Level of Service E describes operations with delay in the range of 55.1 to 80.0 seconds per vehicle. This is considered to be the limit of acceptable delay. These high delay values generally indicate poor progression, long cycle lengths, and high v/c ratios. Individual cycle failures are frequent occurrences.

Level of Service F describes operations with delay in excess of 80.0 seconds per vehicle. This is considered to be unacceptable to most drivers. This condition often occurs with over-saturation (i.e. when arrival flow rates exceed the capacity of the intersection). It may also occur at high v/c ratios below 1.00 with many individual cycle failures. Poor progression and long cycle lengths may also be major contributing causes to such delay levels.

2010 HIGHWAY CAPACITY MANUAL LEVEL OF SERVICE CRITERIA FOR UNSIGNALIZED INTERSECTIONS

In the 2010 Highway Capacity Manual (HCM), Level of Service for unsignalized intersections is determined by the computed or measured control delay and is defined for each minor movement. Level of Service is not defined for the intersection as a whole. Delay is a measure of driver discomfort, frustration, fuel consumption, and lost travel time. The criteria are given in the following the table, and are based on the average control delay for any particular minor movement.

LEVEL OF SERVICE	AVERAGE CONTROL DELAY SEC/VEH			EXPECTED DELAY TO MINOR STREET TRAFFIC
A	0.0	≤	10.0	Little or no delay
B	10.1	to	15.0	Short traffic delays
C	15.1	to	25.0	Average traffic delays
D	25.1	to	35.0	Long traffic delays
E	35.1	to	50.0	Very long traffic delays
F		>	50.0	Severe congestion

Level of Service F exists when there are insufficient gaps of suitable size to allow a side street demand to safely cross through a major street traffic stream. This Level of Service is generally evident from extremely long control delays experienced by side-street traffic and by queuing on the minor-street approaches. The method, however, is based on a constant critical gap size; that is, the critical gap remains constant no matter how long the side-street motorist waits. LOS F may also appear in the form on side-street vehicles selecting smaller-than-usual gaps. In such cases, safety may be a problem, and some disruption to the major traffic stream may result. It is important to note that LOS F may not always result in long queues but may result in adjustments to normal gap acceptance behavior, which are more difficult to observe in the field than queuing.

In most cases at Two-Way Stop Controlled (TWSC) intersections, the critical movement is the minor-street left-turn movement. As such, the minor-street left-turn movement can generally be considered the primary factor affecting overall intersection performance. The lower threshold for LOS F is set at 50 seconds of delay per vehicle. There are many instances, particularly in urban areas, in which the delay equations will predict delays of 50 seconds (LOS F) or more for minor-street movements under very low volume conditions on the minor street (less than 25 vehicle/hour). Since the first term of the equation is a function only of the capacity, the LOS F threshold of 50 sec/vehicle is reached with a movement capacity of approximately 85 vehicle/hour or less.

This procedure assumes random arrivals on the major street. For a typical four-lane arterial with average daily traffic volumes in the range of 15,000 to 20,000 vehicles per day (peak hour, 1,500 to 2,000 vehicle/hour), the delay equation used in the TWSC capacity analysis procedure will predict 50 seconds of delay or more (LOS F) for many urban TWSC intersections that allow minor-street left-turn movements. **The LOS F threshold will be reached regardless of the volume of minor-street left-turn traffic.** Not-withstanding this fact, most low-volume minor-street approaches would not meet any of the volume or delay warrants for signalization of the *Manual on Uniform Traffic Control Devices* (MUTCD) since the warrants define an asymptote at 100 vehicle/hour on the minor approach. As a result, many public agencies that use the HCM Level of Service thresholds to determine the design adequacy of TWSC intersections may be forced to eliminate the minor-street left-turn movement, even when the movement may not present any operational problem, such as the formation of long queues on the minor street or driveway approach.

APPENDIX C

CITY OF SAN MARCOS ROADWAY AND CLASSIFICATION TABLE

CITY OF SAN MARCOS

ROADWAY LEVELS OF SERVICE

Roadway Classification	Volume/Capacity X-SECTION	(0.25) A	(0.5) B	(0.7) C	(0.85) D	(1.00) E
Prime Arterial	106/126 (NP)*	15,000	30,000	42,000	51,000	60,000
Major Arterial						
6 Lane	94/114 (NP)*	12,500	25,000	35,000	42,500	50,000
4 Lane	82/102 (NP)*	10,000	20,000	28,000	34,000	40,000
Secondary						
4 lane Arterial	64/84 (NP)*	7,500	15,000	21,000	25,500	30,000
Collector						
2 Lane	40/60 (NP)*	4,000	7,500	10,000	12,500	15,000
2 Lane	40/60	2,500	5,000	7,000	8,500	10,000
Industrial **						
2 Lane	64/68	5,000	10,000	14,000	17,000	20,000
2 Lane	40/60 (NP)*	2,500	5,000	7,000	8,500	10,000
Residential						
	48/68	2,500	5,000	7,000	8,500	10,000
	40/60 (NP)*	2,500	5,000	7,000	8,500	10,000
Residential						
Cul-de-Sac or Loop Street	48/68	**	**	500	**	**
Interim Road	24/40 or 60	**	**	2,800	**	**

*NP - No Parking

** - Levels of service are not generally applied to residential streets since their primary purpose is to sevice abutting lots, no carry through traffic.

Levels of service are normally apply to roads carrying through traffic between major trip operators and generators.

APPENDIX D

EXISTING PEAK HOUR INTERSECTION ANALYSIS WORKSHEETS

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	224	118	1	243	271	180	2	943	195	381	1007	432
Future Volume (veh/h)	224	118	1	243	271	180	2	943	195	381	1007	432
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.97	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	243	128	0	264	295	0	2	1025	212	414	1095	0
Adj No. of Lanes	2	3	1	1	1	1	1	3	0	2	3	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	321	689	214	300	394	335	4	1406	290	493	2418	753
Arrive On Green	0.09	0.14	0.00	0.17	0.21	0.00	0.00	0.33	0.33	0.14	0.48	0.00
Sat Flow, veh/h	3442	5085	1583	1774	1863	1583	1774	4203	868	3442	5085	1583
Grp Volume(v), veh/h	243	128	0	264	295	0	2	826	411	414	1095	0
Grp Sat Flow(s),veh/h/ln	1721	1695	1583	1774	1863	1583	1774	1695	1681	1721	1695	1583
Q Serve(g_s), s	6.7	2.2	0.0	14.2	14.5	0.0	0.1	21.0	21.0	11.5	14.1	0.0
Cycle Q Clear(g_c), s	6.7	2.2	0.0	14.2	14.5	0.0	0.1	21.0	21.0	11.5	14.1	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.52	1.00		1.00
Lane Grp Cap(c), veh/h	321	689	214	300	394	335	4	1134	562	493	2418	753
V/C Ratio(X)	0.76	0.19	0.00	0.88	0.75	0.00	0.52	0.73	0.73	0.84	0.45	0.00
Avail Cap(c_a), veh/h	500	1456	453	381	663	564	82	1134	562	598	2418	753
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	43.3	37.5	0.0	39.7	36.1	0.0	48.7	28.6	28.7	40.8	17.1	0.0
Incr Delay (d2), s/veh	3.7	0.1	0.0	17.3	2.9	0.0	80.4	4.1	8.1	8.8	0.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.4	1.0	0.0	8.4	7.8	0.0	0.1	10.4	11.0	6.1	6.7	0.0
LnGrp Delay(d),s/veh	46.9	37.6	0.0	57.0	39.0	0.0	129.1	32.8	36.8	49.6	17.8	0.0
LnGrp LOS	D	D		E	D		F	C	D	D	B	
Approach Vol, veh/h		371			559			1239			1509	
Approach Delay, s/veh		43.7			47.5			34.3			26.5	
Approach LOS		D			D			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	19.0	38.7	21.5	18.5	5.2	52.5	14.1	26.0
Change Period (Y+Rc), s	5.0	6.0	5.0	5.3	5.0	6.0	5.0	5.3
Max Green Setting (Gmax), s	17.0	32.7	21.0	28.0	4.5	45.2	14.2	34.8
Max Q Clear Time (g_c+I1), s	13.5	23.0	16.2	4.2	2.1	16.1	8.7	16.5
Green Ext Time (p_c), s	0.6	8.3	0.3	2.7	0.0	20.7	0.4	2.5

Intersection Summary	
HCM 2010 Ctrl Delay	34.0
HCM 2010 LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	11	403	280	222	626	7	57	4	14	0	1	6
Future Volume (veh/h)	11	403	280	222	626	7	57	4	14	0	1	6
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.99	1.00		0.83	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	13	463	322	255	720	8	66	5	16	0	1	7
Adj No. of Lanes	1	3	0	2	2	1	2	1	0	1	1	1
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	21	1020	463	325	1356	599	115	156	499	2	723	610
Arrive On Green	0.01	0.30	0.30	0.09	0.38	0.38	0.03	0.46	0.46	0.00	0.39	0.39
Sat Flow, veh/h	1774	3390	1537	3442	3539	1563	3442	337	1077	1774	1863	1571
Grp Volume(v), veh/h	13	463	322	255	720	8	66	0	21	0	1	7
Grp Sat Flow(s),veh/h/ln	1774	1695	1537	1721	1770	1563	1721	0	1414	1774	1863	1571
Q Serve(g_s), s	0.7	11.1	18.6	7.3	15.8	0.3	1.9	0.0	0.8	0.0	0.0	0.3
Cycle Q Clear(g_c), s	0.7	11.1	18.6	7.3	15.8	0.3	1.9	0.0	0.8	0.0	0.0	0.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.76	1.00		1.00
Lane Grp Cap(c), veh/h	21	1020	463	325	1356	599	115	0	655	2	723	610
V/C Ratio(X)	0.60	0.45	0.70	0.78	0.53	0.01	0.57	0.00	0.03	0.00	0.00	0.01
Avail Cap(c_a), veh/h	106	1150	522	497	1500	662	137	0	655	71	723	610
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	49.4	28.4	31.1	44.5	24.0	19.2	47.9	0.0	14.7	0.0	18.8	18.9
Incr Delay (d2), s/veh	9.8	0.5	4.1	2.1	0.5	0.0	1.7	0.0	0.1	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	5.3	8.4	3.6	7.8	0.1	0.9	0.0	0.3	0.0	0.0	0.1
LnGrp Delay(d),s/veh	59.2	28.9	35.1	46.6	24.5	19.2	49.5	0.0	14.8	0.0	18.8	18.9
LnGrp LOS	E	C	D	D	C	B	D		B		B	B
Approach Vol, veh/h		798			983			87			8	
Approach Delay, s/veh		31.9			30.2			41.1			18.9	
Approach LOS		C			C			D			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.7	36.0	7.6	43.2	5.4	44.3	0.0	50.8
Change Period (Y+Rc), s	* 4.2	5.8	* 4.2	* 4.2	* 4.2	5.8	* 4.2	* 4.2
Max Green Setting (Gmax), s	* 15	34.1	* 4	* 39	* 6	42.6	* 4	* 39
Max Q Clear Time (g_c+I1), s	19.3	20.6	3.9	2.3	2.7	17.8	0.0	2.8
Green Ext Time (p_c), s	0.2	9.4	0.0	0.1	0.0	14.3	0.0	0.1

Intersection Summary	
HCM 2010 Ctrl Delay	31.4
HCM 2010 LOS	C

Notes

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Vol, veh/h	6	433	826	10	5	29
Future Vol, veh/h	6	433	826	10	5	29
Conflicting Peds, #/hr	10	0	0	10	10	10
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	240	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	6	466	888	11	5	31

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	909	0	-	0	1103	469
Stage 1	-	-	-	-	904	-
Stage 2	-	-	-	-	199	-
Critical Hdwy	4.14	-	-	-	6.29	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	6.04	-
Follow-up Hdwy	2.22	-	-	-	3.67	3.32
Pot Cap-1 Maneuver	745	-	-	-	238	541
Stage 1	-	-	-	-	346	-
Stage 2	-	-	-	-	776	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	738	-	-	-	232	531
Mov Cap-2 Maneuver	-	-	-	-	232	-
Stage 1	-	-	-	-	343	-
Stage 2	-	-	-	-	762	-

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	13.8
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	738	-	-	-	446
HCM Lane V/C Ratio	0.009	-	-	-	0.082
HCM Control Delay (s)	9.9	-	-	-	13.8
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	100	126	167	14	21	60	385	970	121	407	766	75
Future Volume (veh/h)	100	126	167	14	21	60	385	970	121	407	766	75
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.95	1.00		0.94	1.00		0.98	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	102	129	170	14	21	61	393	990	123	415	782	77
Adj No. of Lanes	2	2	1	1	1	1	1	3	0	2	3	1
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	227	764	326	29	309	479	435	1901	236	504	1613	593
Arrive On Green	0.07	0.22	0.22	0.02	0.17	0.17	0.25	0.42	0.42	0.15	0.32	0.32
Sat Flow, veh/h	3442	3539	1508	1774	1863	1491	1774	4570	566	3442	5085	1539
Grp Volume(v), veh/h	102	129	170	14	21	61	393	734	379	415	782	77
Grp Sat Flow(s),veh/h/ln	1721	1770	1508	1774	1863	1491	1774	1695	1746	1721	1695	1539
Q Serve(g_s), s	2.8	3.0	9.9	0.8	0.9	2.9	21.4	16.1	16.2	11.7	12.4	3.2
Cycle Q Clear(g_c), s	2.8	3.0	9.9	0.8	0.9	2.9	21.4	16.1	16.2	11.7	12.4	3.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.32	1.00		1.00
Lane Grp Cap(c), veh/h	227	764	326	29	309	479	435	1411	727	504	1613	593
V/C Ratio(X)	0.45	0.17	0.52	0.49	0.07	0.13	0.90	0.52	0.52	0.82	0.48	0.13
Avail Cap(c_a), veh/h	242	1135	484	89	560	680	658	1411	727	725	1613	593
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	44.8	31.8	34.6	48.7	35.1	24.6	36.5	21.7	21.7	41.3	27.5	20.0
Incr Delay (d2), s/veh	1.4	0.1	1.3	12.4	0.1	0.1	11.3	1.4	2.7	5.2	1.0	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	1.5	4.2	0.5	0.5	1.2	11.8	7.8	8.3	5.9	5.9	1.5
LnGrp Delay(d),s/veh	46.2	31.9	35.9	61.0	35.2	24.7	47.8	23.1	24.4	46.5	28.5	20.4
LnGrp LOS	D	C	D	E	D	C	D	C	C	D	C	C
Approach Vol, veh/h		401			96			1506			1274	
Approach Delay, s/veh		37.2			32.3			29.8			33.9	
Approach LOS		D			C			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	19.6	47.0	6.6	26.5	29.5	37.1	11.6	21.6
Change Period (Y+Rc), s	5.0	5.5	5.0	5.0	5.0	5.5	5.0	5.0
Max Green Setting (Gmax), s	21.0	41.5	5.0	32.0	37.0	25.5	7.0	30.0
Max Q Clear Time (g_c+I1), s	13.7	18.2	2.8	11.9	23.4	14.4	4.8	4.9
Green Ext Time (p_c), s	0.9	14.8	0.0	1.7	1.1	8.5	0.0	1.7

Intersection Summary	
HCM 2010 Ctrl Delay	32.4
HCM 2010 LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	402	281	2	290	286	353	7	1099	297	397	918	399
Future Volume (veh/h)	402	281	2	290	286	353	7	1099	297	397	918	399
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.97	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	419	293	0	302	298	0	7	1145	309	414	956	0
Adj No. of Lanes	2	3	1	1	1	1	1	3	0	2	3	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	489	837	261	330	389	330	12	1258	340	470	2275	708
Arrive On Green	0.14	0.16	0.00	0.19	0.21	0.00	0.01	0.32	0.32	0.14	0.45	0.00
Sat Flow, veh/h	3442	5085	1583	1774	1863	1583	1774	3959	1069	3442	5085	1583
Grp Volume(v), veh/h	419	293	0	302	298	0	7	980	474	414	956	0
Grp Sat Flow(s),veh/h/ln	1721	1695	1583	1774	1863	1583	1774	1695	1638	1721	1695	1583
Q Serve(g_s), s	13.0	5.6	0.0	18.2	16.5	0.0	0.4	30.3	30.3	12.9	14.0	0.0
Cycle Q Clear(g_c), s	13.0	5.6	0.0	18.2	16.5	0.0	0.4	30.3	30.3	12.9	14.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.65	1.00		1.00
Lane Grp Cap(c), veh/h	489	837	261	330	389	330	12	1077	520	470	2275	708
V/C Ratio(X)	0.86	0.35	0.00	0.92	0.77	0.00	0.56	0.91	0.91	0.88	0.42	0.00
Avail Cap(c_a), veh/h	574	1304	406	341	525	447	73	1077	520	473	2275	708
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	45.8	40.4	0.0	43.6	40.7	0.0	54.1	35.8	35.8	46.3	20.5	0.0
Incr Delay (d2), s/veh	10.9	0.3	0.0	27.9	4.7	0.0	34.3	12.8	22.5	17.2	0.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.9	2.6	0.0	11.4	8.9	0.0	0.3	16.1	16.9	7.3	6.7	0.0
LnGrp Delay(d),s/veh	56.7	40.7	0.0	71.5	45.4	0.0	88.4	48.6	58.2	63.5	21.1	0.0
LnGrp LOS	E	D		E	D		F	D	E	E	C	
Approach Vol, veh/h		712			600			1461			1370	
Approach Delay, s/veh		50.1			58.5			51.9			33.9	
Approach LOS		D			E			D			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	19.9	40.7	25.3	23.3	5.8	54.8	20.5	28.1
Change Period (Y+Rc), s	5.0	6.0	5.0	5.3	5.0	6.0	5.0	5.3
Max Green Setting (Gmax), s	15.0	34.7	21.0	28.0	4.5	45.2	18.2	30.8
Max Q Clear Time (g_c+I1), s	14.9	32.3	20.2	7.6	2.4	16.0	15.0	18.5
Green Ext Time (p_c), s	0.0	2.2	0.1	3.7	0.0	21.5	0.5	3.0

Intersection Summary	
HCM 2010 Ctrl Delay	46.6
HCM 2010 LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	32	793	150	90	646	8	274	47	61	13	19	41
Future Volume (veh/h)	32	793	150	90	646	8	274	47	61	13	19	41
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.99	1.00		0.87	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	40	979	185	111	798	10	338	58	75	16	23	51
Adj No. of Lanes	1	3	0	2	2	1	2	1	0	1	1	1
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	51	1538	290	164	1341	592	394	287	372	24	605	504
Arrive On Green	0.03	0.36	0.36	0.05	0.38	0.38	0.11	0.43	0.43	0.01	0.32	0.32
Sat Flow, veh/h	1774	4273	805	3442	3539	1562	3442	676	874	1774	1863	1553
Grp Volume(v), veh/h	40	776	388	111	798	10	338	0	133	16	23	51
Grp Sat Flow(s),veh/h/ln	1774	1695	1688	1721	1770	1562	1721	0	1550	1774	1863	1553
Q Serve(g_s), s	2.7	22.8	22.9	3.8	21.7	0.5	11.6	0.0	6.5	1.1	1.0	2.8
Cycle Q Clear(g_c), s	2.7	22.8	22.9	3.8	21.7	0.5	11.6	0.0	6.5	1.1	1.0	2.8
Prop In Lane	1.00		0.48	1.00		1.00	1.00		0.56	1.00		1.00
Lane Grp Cap(c), veh/h	51	1220	608	164	1341	592	394	0	659	24	605	504
V/C Ratio(X)	0.78	0.64	0.64	0.68	0.60	0.02	0.86	0.00	0.20	0.65	0.04	0.10
Avail Cap(c_a), veh/h	174	1411	702	338	1473	650	453	0	659	230	605	504
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	58.0	31.9	32.0	56.3	29.9	23.3	52.2	0.0	21.7	59.0	27.8	28.3
Incr Delay (d2), s/veh	9.2	1.0	2.0	1.8	0.7	0.0	12.3	0.0	0.7	10.5	0.1	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	10.8	11.0	1.9	10.8	0.2	6.2	0.0	2.9	0.6	0.5	1.2
LnGrp Delay(d),s/veh	67.2	32.9	33.9	58.1	30.6	23.3	64.6	0.0	22.4	69.5	27.9	28.7
LnGrp LOS	E	C	C	E	C	C	E		C	E	C	C
Approach Vol, veh/h		1204			919			471			90	
Approach Delay, s/veh		34.4			33.9			52.6			35.8	
Approach LOS		C			C			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.9	49.1	18.0	43.2	7.7	51.3	5.9	55.3
Change Period (Y+Rc), s	* 4.2	5.8	* 4.2	* 4.2	* 4.2	5.8	* 4.2	* 4.2
Max Green Setting (Gmax), s	* 12	50.0	* 16	* 39	* 12	50.0	* 16	* 39
Max Q Clear Time (g_c+I1), s	5.8	24.9	13.6	4.8	4.7	23.7	3.1	8.5
Green Ext Time (p_c), s	0.1	18.3	0.2	0.7	0.0	19.0	0.0	0.7

Intersection Summary	
HCM 2010 Ctrl Delay	37.4
HCM 2010 LOS	D

Notes

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Vol, veh/h	13	863	712	9	11	32
Future Vol, veh/h	13	863	712	9	11	32
Conflicting Peds, #/hr	10	0	0	10	10	10
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	240	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	15	1003	828	10	13	37

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	848	0	-	0	1275	439
Stage 1	-	-	-	-	843	-
Stage 2	-	-	-	-	432	-
Critical Hdwy	4.14	-	-	-	6.29	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	6.04	-
Follow-up Hdwy	2.22	-	-	-	3.67	3.32
Pot Cap-1 Maneuver	785	-	-	-	189	566
Stage 1	-	-	-	-	372	-
Stage 2	-	-	-	-	587	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	778	-	-	-	182	555
Mov Cap-2 Maneuver	-	-	-	-	182	-
Stage 1	-	-	-	-	368	-
Stage 2	-	-	-	-	570	-

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	16.5
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	778	-	-	-	364
HCM Lane V/C Ratio	0.019	-	-	-	0.137
HCM Control Delay (s)	9.7	-	-	-	16.5
HCM Lane LOS	A	-	-	-	C
HCM 95th %tile Q(veh)	0.1	-	-	-	0.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	305	162	318	150	167	367	189	790	63	167	1019	88
Future Volume (veh/h)	305	162	318	150	167	367	189	790	63	167	1019	88
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		0.96	1.00		0.97	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	328	174	342	161	180	395	203	849	68	180	1096	95
Adj No. of Lanes	2	2	1	1	1	1	1	3	0	2	3	1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	396	964	413	191	494	517	235	1733	138	251	1538	647
Arrive On Green	0.12	0.27	0.27	0.11	0.27	0.27	0.13	0.36	0.36	0.07	0.30	0.30
Sat Flow, veh/h	3442	3539	1514	1774	1863	1513	1774	4791	382	3442	5085	1538
Grp Volume(v), veh/h	328	174	342	161	180	395	203	600	317	180	1096	95
Grp Sat Flow(s),veh/h/ln	1721	1770	1514	1774	1863	1513	1774	1695	1783	1721	1695	1538
Q Serve(g_s), s	10.3	4.2	23.5	9.9	8.7	25.9	12.4	15.2	15.3	5.7	21.2	4.2
Cycle Q Clear(g_c), s	10.3	4.2	23.5	9.9	8.7	25.9	12.4	15.2	15.3	5.7	21.2	4.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.21	1.00		1.00
Lane Grp Cap(c), veh/h	396	964	413	191	494	517	235	1226	645	251	1538	647
V/C Ratio(X)	0.83	0.18	0.83	0.84	0.36	0.76	0.86	0.49	0.49	0.72	0.71	0.15
Avail Cap(c_a), veh/h	497	964	413	256	505	525	320	1226	645	653	1538	647
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	47.9	30.8	37.9	48.5	33.1	32.8	47.1	27.4	27.4	50.2	34.3	20.0
Incr Delay (d2), s/veh	9.1	0.1	13.2	17.0	0.5	6.5	16.5	1.4	2.7	3.8	2.8	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.4	2.0	11.4	5.7	4.6	11.7	7.2	7.3	8.0	2.8	10.3	1.9
LnGrp Delay(d),s/veh	57.1	30.9	51.1	65.5	33.6	39.3	63.5	28.8	30.1	54.0	37.2	20.5
LnGrp LOS	E	C	D	E	C	D	E	C	C	D	D	C
Approach Vol, veh/h		844			736			1120			1371	
Approach Delay, s/veh		49.2			43.6			35.5			38.2	
Approach LOS		D			D			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.1	45.6	16.9	35.2	19.7	39.0	17.7	34.4
Change Period (Y+Rc), s	5.0	5.5	5.0	5.0	5.0	5.5	5.0	5.0
Max Green Setting (Gmax), s	21.0	32.5	16.0	30.0	20.0	33.5	16.0	30.0
Max Q Clear Time (g_c+I1), s	7.7	17.3	11.9	25.5	14.4	23.2	12.3	27.9
Green Ext Time (p_c), s	0.5	11.4	0.1	2.2	0.3	8.2	0.4	1.0

Intersection Summary	
HCM 2010 Ctrl Delay	40.7
HCM 2010 LOS	D

APPENDIX E

EXISTING + PROJECT PEAK HOUR INTERSECTION ANALYSIS WORKSHEETS

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	224	118	1	243	271	182	2	957	195	388	1065	432
Future Volume (veh/h)	224	118	1	243	271	182	2	957	195	388	1065	432
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.97	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	243	128	0	264	295	0	2	1040	212	422	1158	0
Adj No. of Lanes	2	3	1	1	1	1	1	3	0	2	3	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	320	687	214	300	393	334	4	1405	286	500	2423	754
Arrive On Green	0.09	0.14	0.00	0.17	0.21	0.00	0.00	0.33	0.33	0.15	0.48	0.00
Sat Flow, veh/h	3442	5085	1583	1774	1863	1583	1774	4215	858	3442	5085	1583
Grp Volume(v), veh/h	243	128	0	264	295	0	2	836	416	422	1158	0
Grp Sat Flow(s),veh/h/ln	1721	1695	1583	1774	1863	1583	1774	1695	1683	1721	1695	1583
Q Serve(g_s), s	6.8	2.2	0.0	14.2	14.6	0.0	0.1	21.4	21.5	11.7	15.1	0.0
Cycle Q Clear(g_c), s	6.8	2.2	0.0	14.2	14.6	0.0	0.1	21.4	21.5	11.7	15.1	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.51	1.00		1.00
Lane Grp Cap(c), veh/h	320	687	214	300	393	334	4	1130	561	500	2423	754
V/C Ratio(X)	0.76	0.19	0.00	0.88	0.75	0.00	0.52	0.74	0.74	0.84	0.48	0.00
Avail Cap(c_a), veh/h	498	1452	452	380	661	562	81	1130	561	597	2423	754
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	43.4	37.6	0.0	39.8	36.3	0.0	48.9	28.9	28.9	40.8	17.4	0.0
Incr Delay (d2), s/veh	3.7	0.1	0.0	17.4	2.9	0.0	80.4	4.4	8.6	9.3	0.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.4	1.0	0.0	8.4	7.8	0.0	0.1	10.7	11.3	6.2	7.2	0.0
LnGrp Delay(d),s/veh	47.1	37.8	0.0	57.2	39.2	0.0	129.3	33.3	37.5	50.1	18.1	0.0
LnGrp LOS	D	D		E	D		F	C	D	D	B	
Approach Vol, veh/h		371			559			1254			1580	
Approach Delay, s/veh		43.9			47.7			34.8			26.6	
Approach LOS		D			D			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	19.2	38.7	21.6	18.6	5.2	52.7	14.1	26.0
Change Period (Y+Rc), s	5.0	6.0	5.0	5.3	5.0	6.0	5.0	5.3
Max Green Setting (Gmax), s	17.0	32.7	21.0	28.0	4.5	45.2	14.2	34.8
Max Q Clear Time (g_c+I1), s	13.7	23.5	16.2	4.2	2.1	17.1	8.8	16.6
Green Ext Time (p_c), s	0.5	8.1	0.3	2.7	0.0	20.7	0.4	2.4

Intersection Summary	
HCM 2010 Ctrl Delay	34.2
HCM 2010 LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	11	403	287	252	626	7	59	4	21	0	1	6
Future Volume (veh/h)	11	403	287	252	626	7	59	4	21	0	1	6
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.99	1.00		0.83	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	13	463	330	290	720	8	68	5	24	0	1	7
Adj No. of Lanes	1	3	0	2	2	1	2	1	0	1	1	1
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	21	1017	461	358	1388	613	115	109	522	2	712	600
Arrive On Green	0.01	0.30	0.30	0.10	0.39	0.39	0.03	0.46	0.46	0.00	0.38	0.38
Sat Flow, veh/h	1774	3390	1537	3442	3539	1563	3442	238	1143	1774	1863	1571
Grp Volume(v), veh/h	13	463	330	290	720	8	68	0	29	0	1	7
Grp Sat Flow(s),veh/h/ln	1774	1695	1537	1721	1770	1563	1721	0	1382	1774	1863	1571
Q Serve(g_s), s	0.7	11.3	19.5	8.4	15.8	0.3	2.0	0.0	1.2	0.0	0.0	0.3
Cycle Q Clear(g_c), s	0.7	11.3	19.5	8.4	15.8	0.3	2.0	0.0	1.2	0.0	0.0	0.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.83	1.00		1.00
Lane Grp Cap(c), veh/h	21	1017	461	358	1388	613	115	0	631	2	712	600
V/C Ratio(X)	0.61	0.46	0.72	0.81	0.52	0.01	0.59	0.00	0.05	0.00	0.00	0.01
Avail Cap(c_a), veh/h	104	1132	514	489	1477	652	135	0	631	70	712	600
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	50.2	29.0	31.8	44.7	23.7	19.0	48.6	0.0	15.4	0.0	19.5	19.6
Incr Delay (d2), s/veh	9.8	0.5	4.8	5.1	0.4	0.0	2.0	0.0	0.1	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	5.3	8.9	4.2	7.8	0.1	1.0	0.0	0.5	0.0	0.0	0.1
LnGrp Delay(d),s/veh	60.0	29.4	36.6	49.8	24.1	19.0	50.6	0.0	15.5	0.0	19.5	19.6
LnGrp LOS	E	C	D	D	C	B	D		B		B	B
Approach Vol, veh/h		806			1018			97			8	
Approach Delay, s/veh		32.9			31.4			40.1			19.6	
Approach LOS		C			C			D			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.8	36.4	7.6	43.2	5.4	45.8	0.0	50.8
Change Period (Y+Rc), s	* 4.2	5.8	* 4.2	* 4.2	* 4.2	5.8	* 4.2	* 4.2
Max Green Setting (Gmax), s	* 15	34.1	* 4	* 39	* 6	42.6	* 4	* 39
Max Q Clear Time (g_c+I1), s	10.4	21.5	4.0	2.3	2.7	17.8	0.0	3.2
Green Ext Time (p_c), s	0.2	8.9	0.0	0.1	0.0	14.4	0.0	0.1

Intersection Summary	
HCM 2010 Ctrl Delay	32.4
HCM 2010 LOS	C

Notes

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Vol, veh/h	6	440	856	10	5	29
Future Vol, veh/h	6	440	856	10	5	29
Conflicting Peds, #/hr	10	0	0	10	10	10
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	240	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	6	473	920	11	5	31

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	941	0	-	0	1138	486
Stage 1	-	-	-	-	936	-
Stage 2	-	-	-	-	202	-
Critical Hdwy	4.14	-	-	-	6.29	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	6.04	-
Follow-up Hdwy	2.22	-	-	-	3.67	3.32
Pot Cap-1 Maneuver	724	-	-	-	227	527
Stage 1	-	-	-	-	333	-
Stage 2	-	-	-	-	773	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	717	-	-	-	221	517
Mov Cap-2 Maneuver	-	-	-	-	221	-
Stage 1	-	-	-	-	330	-
Stage 2	-	-	-	-	759	-

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	14.1
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	717	-	-	-	432
HCM Lane V/C Ratio	0.009	-	-	-	0.085
HCM Control Delay (s)	10.1	-	-	-	14.1
HCM Lane LOS	B	-	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	100	151	167	19	27	74	385	970	139	465	766	75
Future Volume (veh/h)	100	151	167	19	27	74	385	970	139	465	766	75
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.95	1.00		0.94	1.00		0.98	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	102	154	170	19	28	76	393	990	142	474	782	77
Adj No. of Lanes	2	2	1	1	1	1	1	3	0	2	3	1
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	222	749	319	36	312	506	434	1817	260	558	1642	599
Arrive On Green	0.06	0.21	0.21	0.02	0.17	0.17	0.24	0.41	0.41	0.16	0.32	0.32
Sat Flow, veh/h	3442	3539	1507	1774	1863	1492	1774	4480	641	3442	5085	1539
Grp Volume(v), veh/h	102	154	170	19	28	76	393	749	383	474	782	77
Grp Sat Flow(s),veh/h/ln	1721	1770	1507	1774	1863	1492	1774	1695	1731	1721	1695	1539
Q Serve(g_s), s	2.9	3.7	10.3	1.1	1.3	3.7	22.0	17.2	17.3	13.7	12.6	3.3
Cycle Q Clear(g_c), s	2.9	3.7	10.3	1.1	1.3	3.7	22.0	17.2	17.3	13.7	12.6	3.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.37	1.00		1.00
Lane Grp Cap(c), veh/h	222	749	319	36	312	506	434	1375	702	558	1642	599
V/C Ratio(X)	0.46	0.21	0.53	0.53	0.09	0.15	0.91	0.54	0.55	0.85	0.48	0.13
Avail Cap(c_a), veh/h	235	1107	471	87	546	694	641	1375	702	706	1642	599
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	46.1	33.2	35.8	49.6	36.0	24.2	37.5	23.2	23.2	41.7	27.7	20.2
Incr Delay (d2), s/veh	1.5	0.1	1.4	11.3	0.1	0.1	12.2	1.6	3.0	7.9	1.0	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	1.8	4.4	0.6	0.7	1.5	12.3	8.3	8.8	7.1	6.0	1.5
LnGrp Delay(d),s/veh	47.6	33.4	37.2	60.9	36.1	24.4	49.7	24.8	26.3	49.6	28.7	20.6
LnGrp LOS	D	C	D	E	D	C	D	C	C	D	C	C
Approach Vol, veh/h		426			123			1525			1333	
Approach Delay, s/veh		38.3			32.7			31.6			35.7	
Approach LOS		D			C			C			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	21.6	47.0	7.1	26.7	30.0	38.5	11.6	22.1
Change Period (Y+Rc), s	5.0	5.5	5.0	5.0	5.0	5.5	5.0	5.0
Max Green Setting (Gmax), s	21.0	41.5	5.0	32.0	37.0	25.5	7.0	30.0
Max Q Clear Time (g_c+I1), s	15.7	19.3	3.1	12.3	24.0	14.6	4.9	5.7
Green Ext Time (p_c), s	0.9	14.5	0.0	1.9	1.0	8.4	0.0	2.0

Intersection Summary	
HCM 2010 Ctrl Delay	34.1
HCM 2010 LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	402	281	2	290	286	358	7	1144	297	399	937	399
Future Volume (veh/h)	402	281	2	290	286	358	7	1144	297	399	937	399
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.97	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	419	293	0	302	298	0	7	1192	309	416	976	0
Adj No. of Lanes	2	3	1	1	1	1	1	3	0	2	3	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	489	837	260	330	388	330	12	1270	329	472	2276	709
Arrive On Green	0.14	0.16	0.00	0.19	0.21	0.00	0.01	0.32	0.32	0.14	0.45	0.00
Sat Flow, veh/h	3442	5085	1583	1774	1863	1583	1774	3998	1036	3442	5085	1583
Grp Volume(v), veh/h	419	293	0	302	298	0	7	1011	490	416	976	0
Grp Sat Flow(s),veh/h/ln	1721	1695	1583	1774	1863	1583	1774	1695	1645	1721	1695	1583
Q Serve(g_s), s	13.0	5.6	0.0	18.2	16.5	0.0	0.4	31.7	31.7	13.0	14.3	0.0
Cycle Q Clear(g_c), s	13.0	5.6	0.0	18.2	16.5	0.0	0.4	31.7	31.7	13.0	14.3	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.63	1.00		1.00
Lane Grp Cap(c), veh/h	489	837	260	330	388	330	12	1077	522	472	2276	709
V/C Ratio(X)	0.86	0.35	0.00	0.92	0.77	0.00	0.56	0.94	0.94	0.88	0.43	0.00
Avail Cap(c_a), veh/h	573	1303	406	341	525	446	73	1077	522	472	2276	709
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	45.8	40.5	0.0	43.6	40.7	0.0	54.1	36.3	36.3	46.3	20.6	0.0
Incr Delay (d2), s/veh	11.0	0.3	0.0	27.9	4.7	0.0	34.3	16.2	26.8	17.5	0.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.9	2.6	0.0	11.5	9.0	0.0	0.3	17.2	18.2	7.3	6.8	0.0
LnGrp Delay(d),s/veh	56.8	40.7	0.0	71.5	45.4	0.0	88.4	52.4	63.1	63.8	21.2	0.0
LnGrp LOS	E	D		E	D		F	D	E	E	C	
Approach Vol, veh/h		712			600			1508			1392	
Approach Delay, s/veh		50.2			58.6			56.1			33.9	
Approach LOS		D			E			E			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	20.0	40.7	25.3	23.3	5.8	54.9	20.5	28.1
Change Period (Y+Rc), s	5.0	6.0	5.0	5.3	5.0	6.0	5.0	5.3
Max Green Setting (Gmax), s	15.0	34.7	21.0	28.0	4.5	45.2	18.2	30.8
Max Q Clear Time (g_c+I1), s	15.0	33.7	20.2	7.6	2.4	16.3	15.0	18.5
Green Ext Time (p_c), s	0.0	1.0	0.1	3.7	0.0	21.8	0.5	3.0

Intersection Summary	
HCM 2010 Ctrl Delay	48.1
HCM 2010 LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	32	793	152	100	646	8	279	47	85	13	19	41
Future Volume (veh/h)	32	793	152	100	646	8	279	47	85	13	19	41
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.99	1.00		0.87	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	40	979	188	123	798	10	344	58	105	16	23	51
Adj No. of Lanes	1	3	0	2	2	1	2	1	0	1	1	1
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	51	1528	292	177	1349	596	399	228	414	24	600	500
Arrive On Green	0.03	0.36	0.36	0.05	0.38	0.38	0.12	0.42	0.42	0.01	0.32	0.32
Sat Flow, veh/h	1774	4260	816	3442	3539	1563	3442	538	975	1774	1863	1552
Grp Volume(v), veh/h	40	778	389	123	798	10	344	0	163	16	23	51
Grp Sat Flow(s),veh/h/ln	1774	1695	1685	1721	1770	1563	1721	0	1513	1774	1863	1552
Q Serve(g_s), s	2.7	23.2	23.3	4.3	21.8	0.5	11.9	0.0	8.4	1.1	1.0	2.8
Cycle Q Clear(g_c), s	2.7	23.2	23.3	4.3	21.8	0.5	11.9	0.0	8.4	1.1	1.0	2.8
Prop In Lane	1.00		0.48	1.00		1.00	1.00		0.64	1.00		1.00
Lane Grp Cap(c), veh/h	51	1216	604	177	1349	596	399	0	642	24	600	500
V/C Ratio(X)	0.78	0.64	0.64	0.69	0.59	0.02	0.86	0.00	0.25	0.66	0.04	0.10
Avail Cap(c_a), veh/h	173	1400	696	335	1461	645	449	0	642	229	600	500
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	58.4	32.3	32.4	56.5	29.9	23.3	52.6	0.0	22.5	59.4	28.2	28.8
Incr Delay (d2), s/veh	9.2	1.0	2.1	1.8	0.7	0.0	13.2	0.0	1.0	10.6	0.1	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	11.0	11.1	2.1	10.8	0.2	6.4	0.0	3.7	0.6	0.6	1.2
LnGrp Delay(d),s/veh	67.6	33.4	34.4	58.3	30.7	23.4	65.8	0.0	23.4	70.0	28.3	29.2
LnGrp LOS	E	C	C	E	C	C	E		C	E	C	C
Approach Vol, veh/h		1207			931			507			90	
Approach Delay, s/veh		34.8			34.2			52.2			36.2	
Approach LOS		C			C			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.4	49.2	18.2	43.2	7.7	52.0	5.9	55.6
Change Period (Y+Rc), s	* 4.2	5.8	* 4.2	* 4.2	* 4.2	5.8	* 4.2	* 4.2
Max Green Setting (Gmax), s	* 12	50.0	* 16	* 39	* 12	50.0	* 16	* 39
Max Q Clear Time (g_c+I1), s	6.3	25.3	13.9	4.8	4.7	23.8	3.1	10.4
Green Ext Time (p_c), s	0.1	18.2	0.2	0.9	0.0	19.0	0.0	0.9

Intersection Summary	
HCM 2010 Ctrl Delay	37.9
HCM 2010 LOS	D

Notes

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Vol, veh/h	13	887	722	9	11	32
Future Vol, veh/h	13	887	722	9	11	32
Conflicting Peds, #/hr	10	0	0	10	10	10
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	240	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	15	1031	840	10	13	37

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	860	0	-	0	1298	445
Stage 1	-	-	-	-	855	-
Stage 2	-	-	-	-	443	-
Critical Hdwy	4.14	-	-	-	6.29	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	6.04	-
Follow-up Hdwy	2.22	-	-	-	3.67	3.32
Pot Cap-1 Maneuver	777	-	-	-	183	561
Stage 1	-	-	-	-	367	-
Stage 2	-	-	-	-	580	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	770	-	-	-	176	550
Mov Cap-2 Maneuver	-	-	-	-	176	-
Stage 1	-	-	-	-	364	-
Stage 2	-	-	-	-	563	-

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	16.8
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	770	-	-	-	356
HCM Lane V/C Ratio	0.02	-	-	-	0.14
HCM Control Delay (s)	9.8	-	-	-	16.8
HCM Lane LOS	A	-	-	-	C
HCM 95th %tile Q(veh)	0.1	-	-	-	0.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	305	170	318	164	187	412	189	790	70	186	1019	88
Future Volume (veh/h)	305	170	318	164	187	412	189	790	70	186	1019	88
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		0.96	1.00		0.97	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	328	183	342	176	201	443	203	849	75	200	1096	95
Adj No. of Lanes	2	2	1	1	1	1	1	3	0	2	3	1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	395	948	405	206	501	532	234	1678	148	272	1527	644
Arrive On Green	0.11	0.27	0.27	0.12	0.27	0.27	0.13	0.35	0.35	0.08	0.30	0.30
Sat Flow, veh/h	3442	3539	1513	1774	1863	1514	1774	4748	418	3442	5085	1537
Grp Volume(v), veh/h	328	183	342	176	201	443	203	605	319	200	1096	95
Grp Sat Flow(s),veh/h/ln	1721	1770	1513	1774	1863	1514	1774	1695	1776	1721	1695	1537
Q Serve(g_s), s	10.4	4.5	23.8	10.9	9.9	30.0	12.5	15.7	15.8	6.3	21.4	4.3
Cycle Q Clear(g_c), s	10.4	4.5	23.8	10.9	9.9	30.0	12.5	15.7	15.8	6.3	21.4	4.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.24	1.00		1.00
Lane Grp Cap(c), veh/h	395	948	405	206	501	532	234	1198	627	272	1527	644
V/C Ratio(X)	0.83	0.19	0.84	0.86	0.40	0.83	0.87	0.51	0.51	0.73	0.72	0.15
Avail Cap(c_a), veh/h	494	952	407	254	501	532	318	1198	627	648	1527	644
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	48.3	31.5	38.6	48.4	33.4	33.5	47.4	28.4	28.4	50.2	34.8	20.3
Incr Delay (d2), s/veh	9.4	0.1	14.8	20.4	0.5	10.8	16.8	1.5	2.9	3.8	2.9	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.5	2.2	11.6	6.5	5.2	14.1	7.2	7.6	8.2	3.2	10.5	1.9
LnGrp Delay(d),s/veh	57.7	31.6	53.5	68.7	33.9	44.3	64.2	29.9	31.4	54.0	37.7	20.8
LnGrp LOS	E	C	D	E	C	D	E	C	C	D	D	C
Approach Vol, veh/h		853			820			1127			1391	
Approach Delay, s/veh		50.4			47.0			36.5			38.9	
Approach LOS		D			D			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.8	44.9	17.9	34.9	19.7	39.0	17.8	35.0
Change Period (Y+Rc), s	5.0	5.5	5.0	5.0	5.0	5.5	5.0	5.0
Max Green Setting (Gmax), s	21.0	32.5	16.0	30.0	20.0	33.5	16.0	30.0
Max Q Clear Time (g_c+I1), s	8.3	17.8	12.9	25.8	14.5	23.4	12.4	32.0
Green Ext Time (p_c), s	0.5	11.1	0.1	2.2	0.3	8.1	0.4	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	42.2
HCM 2010 LOS	D

APPENDIX F

EXISTING + CUMULATIVE PROJECTS PEAK HOUR INTERSECTION ANALYSIS WORKSHEETS

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	259	186	1	450	424	343	3	1409	325	618	1504	499
Future Volume (veh/h)	259	186	1	450	424	343	3	1409	325	618	1504	499
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.97	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	282	202	0	489	461	0	3	1532	353	672	1635	0
Adj No. of Lanes	2	3	1	1	1	1	1	3	0	2	3	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	346	967	301	328	511	435	6	1184	271	515	2209	688
Arrive On Green	0.10	0.19	0.00	0.18	0.27	0.00	0.00	0.29	0.29	0.15	0.43	0.00
Sat Flow, veh/h	3442	5085	1583	1774	1863	1583	1774	4113	940	3442	5085	1583
Grp Volume(v), veh/h	282	202	0	489	461	0	3	1261	624	672	1635	0
Grp Sat Flow(s),veh/h/ln	1721	1695	1583	1774	1863	1583	1774	1695	1663	1721	1695	1583
Q Serve(g_s), s	9.1	3.8	0.0	21.0	27.1	0.0	0.2	32.7	32.7	17.0	30.4	0.0
Cycle Q Clear(g_c), s	9.1	3.8	0.0	21.0	27.1	0.0	0.2	32.7	32.7	17.0	30.4	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.57	1.00		1.00
Lane Grp Cap(c), veh/h	346	967	301	328	511	435	6	976	479	515	2209	688
V/C Ratio(X)	0.82	0.21	0.00	1.49	0.90	0.00	0.53	1.29	1.30	1.30	0.74	0.00
Avail Cap(c_a), veh/h	430	1253	390	328	571	485	70	976	479	515	2209	688
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	50.1	38.8	0.0	46.3	39.7	0.0	56.5	40.4	40.4	48.3	26.8	0.0
Incr Delay (d2), s/veh	9.5	0.1	0.0	236.5	16.4	0.0	60.7	139.1	151.3	150.7	2.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.8	1.8	0.0	31.8	16.3	0.0	0.2	34.0	35.0	18.8	14.7	0.0
LnGrp Delay(d),s/veh	59.5	38.9	0.0	282.8	56.2	0.0	117.3	179.5	191.8	199.0	29.1	0.0
LnGrp LOS	E	D		F	E		F	F	F	F	C	
Approach Vol, veh/h		484			950			1888			2307	
Approach Delay, s/veh		50.9			172.8			183.5			78.6	
Approach LOS		D			F			F			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	22.0	38.7	26.0	26.9	5.4	55.3	16.4	36.5
Change Period (Y+Rc), s	5.0	6.0	5.0	5.3	5.0	6.0	5.0	5.3
Max Green Setting (Gmax), s	17.0	32.7	21.0	28.0	4.5	45.2	14.2	34.8
Max Q Clear Time (g_c+I1), s	19.0	34.7	23.0	5.8	2.2	32.4	11.1	29.1
Green Ext Time (p_c), s	0.0	0.0	0.0	4.4	0.0	12.3	0.3	2.1

Intersection Summary	
HCM 2010 Ctrl Delay	127.3
HCM 2010 LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	70	730	329	290	1109	51	64	29	20	38	17	49
Future Volume (veh/h)	70	730	329	290	1109	51	64	29	20	38	17	49
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.99	1.00		0.79	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	80	839	378	333	1275	59	74	33	23	44	20	56
Adj No. of Lanes	1	3	0	2	2	1	2	1	0	1	1	1
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	98	1099	493	395	1353	597	122	330	230	56	667	563
Arrive On Green	0.06	0.32	0.32	0.11	0.38	0.38	0.04	0.36	0.36	0.03	0.36	0.36
Sat Flow, veh/h	1774	3405	1527	3442	3539	1563	3442	912	636	1774	1863	1570
Grp Volume(v), veh/h	80	835	382	333	1275	59	74	0	56	44	20	56
Grp Sat Flow(s),veh/h/ln	1774	1695	1542	1721	1770	1563	1721	0	1548	1774	1863	1570
Q Serve(g_s), s	4.9	24.1	24.3	10.3	37.9	2.6	2.3	0.0	2.6	2.7	0.8	2.6
Cycle Q Clear(g_c), s	4.9	24.1	24.3	10.3	37.9	2.6	2.3	0.0	2.6	2.7	0.8	2.6
Prop In Lane	1.00		0.99	1.00		1.00	1.00		0.41	1.00		1.00
Lane Grp Cap(c), veh/h	98	1094	497	395	1353	597	122	0	560	56	667	563
V/C Ratio(X)	0.82	0.76	0.77	0.84	0.94	0.10	0.61	0.00	0.10	0.78	0.03	0.10
Avail Cap(c_a), veh/h	98	1094	497	458	1385	612	126	0	560	65	667	563
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	50.9	33.1	33.2	47.2	32.5	21.6	51.8	0.0	23.0	52.3	22.7	23.2
Incr Delay (d2), s/veh	37.7	3.5	7.5	10.6	12.9	0.1	5.3	0.0	0.4	34.5	0.1	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.4	11.8	11.3	5.5	20.8	1.2	1.2	0.0	1.2	1.8	0.4	1.2
LnGrp Delay(d),s/veh	88.6	36.6	40.7	57.9	45.4	21.7	57.0	0.0	23.3	86.9	22.7	23.6
LnGrp LOS	F	D	D	E	D	C	E		C	F	C	C
Approach Vol, veh/h		1297			1667			130			120	
Approach Delay, s/veh		41.0			47.1			42.5			46.7	
Approach LOS		D			D			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	16.7	40.9	8.0	43.2	10.2	47.4	7.6	43.6
Change Period (Y+Rc), s	* 4.2	5.8	* 4.2	* 4.2	* 4.2	5.8	* 4.2	* 4.2
Max Green Setting (Gmax), s	* 15	34.1	* 4	* 39	* 6	42.6	* 4	* 39
Max Q Clear Time (g_c+I1), s	12.3	26.3	4.3	4.6	6.9	39.9	4.7	4.6
Green Ext Time (p_c), s	0.2	7.4	0.0	0.4	0.0	1.7	0.0	0.4

Intersection Summary	
HCM 2010 Ctrl Delay	44.4
HCM 2010 LOS	D

Notes

Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Vol, veh/h	13	797	1393	18	14	57
Future Vol, veh/h	13	797	1393	18	14	57
Conflicting Peds, #/hr	10	0	0	10	10	10
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	240	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	14	857	1498	19	15	61

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	1527	0	-	0	1889	779
Stage 1	-	-	-	-	1518	-
Stage 2	-	-	-	-	371	-
Critical Hdwy	4.14	-	-	-	6.29	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	6.04	-
Follow-up Hdwy	2.22	-	-	-	3.67	3.32
Pot Cap-1 Maneuver	432	-	-	-	82	339
Stage 1	-	-	-	-	164	-
Stage 2	-	-	-	-	632	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	428	-	-	-	78	333
Mov Cap-2 Maneuver	-	-	-	-	78	-
Stage 1	-	-	-	-	162	-
Stage 2	-	-	-	-	606	-

Approach	EB	WB	SB
HCM Control Delay, s	0.2	0	33.3
HCM LOS			D

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	428	-	-	-	202
HCM Lane V/C Ratio	0.033	-	-	-	0.378
HCM Control Delay (s)	13.7	-	-	-	33.3
HCM Lane LOS	B	-	-	-	D
HCM 95th %tile Q(veh)	0.1	-	-	-	1.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	132	151	221	18	25	79	510	1571	159	533	1241	99
Future Volume (veh/h)	132	151	221	18	25	79	510	1571	159	533	1241	99
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.95	1.00		0.94	1.00		0.97	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	135	154	226	18	26	81	520	1603	162	544	1266	101
Adj No. of Lanes	2	2	1	1	1	1	1	3	0	2	3	1
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	222	782	334	34	328	546	553	1821	184	614	1300	494
Arrive On Green	0.06	0.22	0.22	0.02	0.18	0.18	0.31	0.39	0.39	0.18	0.26	0.26
Sat Flow, veh/h	3442	3539	1509	1774	1863	1495	1774	4683	472	3442	5085	1533
Grp Volume(v), veh/h	135	154	226	18	26	81	520	1160	605	544	1266	101
Grp Sat Flow(s),veh/h/ln	1721	1770	1509	1774	1863	1495	1774	1695	1765	1721	1695	1533
Q Serve(g_s), s	4.1	3.8	14.6	1.1	1.2	3.9	30.5	33.9	34.0	16.5	26.3	5.1
Cycle Q Clear(g_c), s	4.1	3.8	14.6	1.1	1.2	3.9	30.5	33.9	34.0	16.5	26.3	5.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.27	1.00		1.00
Lane Grp Cap(c), veh/h	222	782	334	34	328	546	553	1319	686	614	1300	494
V/C Ratio(X)	0.61	0.20	0.68	0.52	0.08	0.15	0.94	0.88	0.88	0.89	0.97	0.20
Avail Cap(c_a), veh/h	226	1061	453	83	524	703	615	1319	686	677	1300	494
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	48.6	33.8	38.1	51.8	36.7	23.5	35.7	30.3	30.3	42.8	39.4	26.4
Incr Delay (d2), s/veh	4.6	0.1	2.4	11.8	0.1	0.1	21.5	8.6	15.2	12.6	19.4	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.1	1.9	6.3	0.6	0.7	1.6	18.2	17.4	19.4	8.9	14.6	2.3
LnGrp Delay(d),s/veh	53.2	34.0	40.5	63.6	36.8	23.6	57.3	38.9	45.5	55.4	58.8	27.3
LnGrp LOS	D	C	D	E	D	C	E	D	D	E	E	C
Approach Vol, veh/h		515			125			2285			1911	
Approach Delay, s/veh		41.9			32.1			44.8			56.2	
Approach LOS		D			C			D			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	24.0	47.0	7.1	28.6	38.3	32.8	11.9	23.8
Change Period (Y+Rc), s	5.0	5.5	5.0	5.0	5.0	5.5	5.0	5.0
Max Green Setting (Gmax), s	21.0	41.5	5.0	32.0	37.0	25.5	7.0	30.0
Max Q Clear Time (g_c+I1), s	18.5	36.0	3.1	16.6	32.5	28.3	6.1	5.9
Green Ext Time (p_c), s	0.6	5.3	0.0	2.0	0.8	0.0	0.0	2.2

Intersection Summary	
HCM 2010 Ctrl Delay	48.7
HCM 2010 LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	464	421	3	436	355	502	9	1642	516	632	1371	460
Future Volume (veh/h)	464	421	3	436	355	502	9	1642	516	632	1371	460
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.97	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	483	439	0	454	370	0	9	1710	538	658	1428	0
Adj No. of Lanes	2	3	1	1	1	1	1	3	0	2	3	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	535	1050	327	321	432	368	15	1149	349	445	2136	665
Arrive On Green	0.16	0.21	0.00	0.18	0.23	0.00	0.01	0.30	0.30	0.13	0.42	0.00
Sat Flow, veh/h	3442	5085	1583	1774	1863	1583	1774	3839	1167	3442	5085	1583
Grp Volume(v), veh/h	483	439	0	454	370	0	9	1503	745	658	1428	0
Grp Sat Flow(s),veh/h/ln	1721	1695	1583	1774	1863	1583	1774	1695	1616	1721	1695	1583
Q Serve(g_s), s	16.0	8.7	0.0	21.0	22.1	0.0	0.6	34.7	34.7	15.0	26.3	0.0
Cycle Q Clear(g_c), s	16.0	8.7	0.0	21.0	22.1	0.0	0.6	34.7	34.7	15.0	26.3	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.72	1.00		1.00
Lane Grp Cap(c), veh/h	535	1050	327	321	432	368	15	1015	484	445	2136	665
V/C Ratio(X)	0.90	0.42	0.00	1.41	0.86	0.00	0.58	1.48	1.54	1.48	0.67	0.00
Avail Cap(c_a), veh/h	540	1228	382	321	495	421	69	1015	484	445	2136	665
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	48.1	39.9	0.0	47.5	42.7	0.0	57.3	40.6	40.6	50.5	27.1	0.0
Incr Delay (d2), s/veh	18.3	0.3	0.0	203.4	12.5	0.0	30.5	221.9	253.6	226.9	1.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.9	4.1	0.0	28.4	12.8	0.0	0.4	47.5	49.5	21.1	12.6	0.0
LnGrp Delay(d),s/veh	66.4	40.2	0.0	250.9	55.2	0.0	87.8	262.6	294.3	277.4	28.8	0.0
LnGrp LOS	E	D		F	E		F	F	F	F	C	
Approach Vol, veh/h		922			824			2257			2086	
Approach Delay, s/veh		53.9			163.0			272.3			107.2	
Approach LOS		D			F			F			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	20.0	40.7	26.0	29.3	6.0	54.7	23.0	32.2
Change Period (Y+Rc), s	5.0	6.0	5.0	5.3	5.0	6.0	5.0	5.3
Max Green Setting (Gmax), s	15.0	34.7	21.0	28.0	4.5	45.2	18.2	30.8
Max Q Clear Time (g_c+I1), s	17.0	36.7	23.0	10.7	2.6	28.3	18.0	24.1
Green Ext Time (p_c), s	0.0	0.0	0.0	5.0	0.0	16.4	0.0	2.8

Intersection Summary	
HCM 2010 Ctrl Delay	167.9
HCM 2010 LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	123	1267	179	123	821	64	317	82	121	92	33	123
Future Volume (veh/h)	123	1267	179	123	821	64	317	82	121	92	33	123
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.99	1.00		0.83	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	152	1564	221	152	1014	79	391	101	149	114	41	152
Adj No. of Lanes	1	3	0	2	2	1	2	1	0	1	1	1
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	158	1737	245	203	1264	558	411	204	301	138	549	457
Arrive On Green	0.09	0.39	0.39	0.06	0.36	0.36	0.12	0.34	0.34	0.08	0.29	0.29
Sat Flow, veh/h	1774	4485	632	3442	3539	1561	3442	605	892	1774	1863	1550
Grp Volume(v), veh/h	152	1181	604	152	1014	79	391	0	250	114	41	152
Grp Sat Flow(s),veh/h/ln	1774	1695	1727	1721	1770	1561	1721	0	1497	1774	1863	1550
Q Serve(g_s), s	11.3	43.3	43.6	5.7	34.1	4.5	14.9	0.0	17.6	8.4	2.1	10.1
Cycle Q Clear(g_c), s	11.3	43.3	43.6	5.7	34.1	4.5	14.9	0.0	17.6	8.4	2.1	10.1
Prop In Lane	1.00		0.37	1.00		1.00	1.00		0.60	1.00		1.00
Lane Grp Cap(c), veh/h	158	1313	669	203	1264	558	411	0	504	138	549	457
V/C Ratio(X)	0.96	0.90	0.90	0.75	0.80	0.14	0.95	0.00	0.50	0.83	0.07	0.33
Avail Cap(c_a), veh/h	158	1313	669	307	1338	590	411	0	504	209	549	457
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	60.0	38.1	38.2	61.2	38.3	28.8	57.8	0.0	34.9	60.1	33.6	36.4
Incr Delay (d2), s/veh	59.1	8.8	15.9	2.1	3.7	0.2	31.6	0.0	3.5	9.1	0.3	1.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.1	21.8	23.7	2.8	17.3	2.0	8.9	0.0	7.8	4.5	1.1	4.6
LnGrp Delay(d),s/veh	119.0	46.9	54.0	63.3	42.0	28.9	89.5	0.0	38.4	69.2	33.9	38.4
LnGrp LOS	F	D	D	E	D	C	F		D	E	C	D
Approach Vol, veh/h		1937			1245			641			307	
Approach Delay, s/veh		54.8			43.8			69.5			49.2	
Approach LOS		D			D			E			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.0	57.0	20.0	43.2	16.0	53.0	14.5	48.7
Change Period (Y+Rc), s	* 4.2	5.8	* 4.2	* 4.2	* 4.2	5.8	* 4.2	* 4.2
Max Green Setting (Gmax), s	* 13	50.0	* 16	* 39	* 12	50.0	* 16	* 39
Max Q Clear Time (g_c+I1), s	17.7	45.6	16.9	12.1	13.3	36.1	10.4	19.6
Green Ext Time (p_c), s	0.1	4.3	0.0	1.6	0.0	11.1	0.1	1.5

Intersection Summary	
HCM 2010 Ctrl Delay	53.3
HCM 2010 LOS	D

Notes

Intersection	
Int Delay, s/veh	1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Vol, veh/h	39	1450	963	18	15	45
Future Vol, veh/h	39	1450	963	18	15	45
Conflicting Peds, #/hr	10	0	0	10	10	10
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	240	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	45	1686	1120	21	17	52

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	1151	0	-	0	1905	590
Stage 1	-	-	-	-	1140	-
Stage 2	-	-	-	-	765	-
Critical Hdwy	4.14	-	-	-	6.29	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	6.04	-
Follow-up Hdwy	2.22	-	-	-	3.67	3.32
Pot Cap-1 Maneuver	603	-	-	-	80	451
Stage 1	-	-	-	-	261	-
Stage 2	-	-	-	-	391	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	597	-	-	-	73	442
Mov Cap-2 Maneuver	-	-	-	-	73	-
Stage 1	-	-	-	-	259	-
Stage 2	-	-	-	-	358	-

Approach	EB	WB	SB
HCM Control Delay, s	0.3	0	33.4
HCM LOS			D

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	597	-	-	-	195
HCM Lane V/C Ratio	0.076	-	-	-	0.358
HCM Control Delay (s)	11.5	-	-	-	33.4
HCM Lane LOS	B	-	-	-	D
HCM 95th %tile Q(veh)	0.2	-	-	-	1.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	403	194	421	197	200	480	250	1280	83	218	1651	116
Future Volume (veh/h)	403	194	421	197	200	480	250	1280	83	218	1651	116
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.95	1.00		0.95	1.00		0.97	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	433	209	453	212	215	516	269	1376	89	234	1775	125
Adj No. of Lanes	2	2	1	1	1	1	1	3	0	2	3	1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	459	886	378	237	466	517	294	1741	113	303	1421	640
Arrive On Green	0.13	0.25	0.25	0.13	0.25	0.25	0.17	0.36	0.36	0.09	0.28	0.28
Sat Flow, veh/h	3442	3539	1510	1774	1863	1510	1774	4872	315	3442	5085	1535
Grp Volume(v), veh/h	433	209	453	212	215	516	269	957	508	234	1775	125
Grp Sat Flow(s),veh/h/ln	1721	1770	1510	1774	1863	1510	1774	1695	1797	1721	1695	1535
Q Serve(g_s), s	15.0	5.6	30.0	14.1	11.7	30.0	17.9	30.3	30.3	8.0	33.5	6.2
Cycle Q Clear(g_c), s	15.0	5.6	30.0	14.1	11.7	30.0	17.9	30.3	30.3	8.0	33.5	6.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.18	1.00		1.00
Lane Grp Cap(c), veh/h	459	886	378	237	466	517	294	1211	642	303	1421	640
V/C Ratio(X)	0.94	0.24	1.20	0.90	0.46	1.00	0.91	0.79	0.79	0.77	1.25	0.20
Avail Cap(c_a), veh/h	459	886	378	237	466	517	296	1211	642	603	1421	640
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	51.5	35.8	44.9	51.1	38.1	39.8	49.2	34.5	34.5	53.5	43.2	22.5
Incr Delay (d2), s/veh	28.1	0.1	112.4	32.3	0.7	39.0	31.0	5.3	9.6	4.2	118.1	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.9	2.8	24.3	9.0	6.1	22.6	11.3	15.1	16.8	4.0	31.1	2.8
LnGrp Delay(d),s/veh	79.6	35.9	157.3	83.4	38.8	78.8	80.2	39.8	44.1	57.7	161.3	23.2
LnGrp LOS	E	D	F	F	D	E	F	D	D	E	F	C
Approach Vol, veh/h		1095			943			1734			2134	
Approach Delay, s/veh		103.4			70.7			47.3			141.9	
Approach LOS		F			E			D			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	15.5	48.3	21.0	35.0	24.9	39.0	21.0	35.0
Change Period (Y+Rc), s	5.0	5.5	5.0	5.0	5.0	5.5	5.0	5.0
Max Green Setting (Gmax), s	21.0	32.5	16.0	30.0	20.0	33.5	16.0	30.0
Max Q Clear Time (g_c+I1), s	10.0	32.3	16.1	32.0	19.9	35.5	17.0	32.0
Green Ext Time (p_c), s	0.6	0.2	0.0	0.0	0.0	0.0	0.0	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	95.6
HCM 2010 LOS	F

APPENDIX G

EXISTING + PROJECT + CUMULATIVE PROJECTS
PEAK HOUR INTERSECTION ANALYSIS WORKSHEETS

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	259	186	1	450	424	345	3	1423	325	625	1538	499
Future Volume (veh/h)	259	186	1	450	424	345	3	1423	325	625	1538	499
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.97	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	282	202	0	489	461	0	3	1547	353	679	1672	0
Adj No. of Lanes	2	3	1	1	1	1	1	3	0	2	3	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	346	967	301	328	511	435	6	1186	269	515	2209	688
Arrive On Green	0.10	0.19	0.00	0.18	0.27	0.00	0.00	0.29	0.29	0.15	0.43	0.00
Sat Flow, veh/h	3442	5085	1583	1774	1863	1583	1774	4122	933	3442	5085	1583
Grp Volume(v), veh/h	282	202	0	489	461	0	3	1270	630	679	1672	0
Grp Sat Flow(s),veh/h/ln	1721	1695	1583	1774	1863	1583	1774	1695	1664	1721	1695	1583
Q Serve(g_s), s	9.1	3.8	0.0	21.0	27.1	0.0	0.2	32.7	32.7	17.0	31.5	0.0
Cycle Q Clear(g_c), s	9.1	3.8	0.0	21.0	27.1	0.0	0.2	32.7	32.7	17.0	31.5	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.56	1.00		1.00
Lane Grp Cap(c), veh/h	346	967	301	328	511	435	6	976	479	515	2209	688
V/C Ratio(X)	0.82	0.21	0.00	1.49	0.90	0.00	0.53	1.30	1.31	1.32	0.76	0.00
Avail Cap(c_a), veh/h	430	1253	390	328	571	485	70	976	479	515	2209	688
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	50.1	38.8	0.0	46.3	39.7	0.0	56.5	40.4	40.4	48.3	27.1	0.0
Incr Delay (d2), s/veh	9.5	0.1	0.0	236.5	16.4	0.0	60.7	143.3	155.7	156.5	2.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.8	1.8	0.0	31.8	16.3	0.0	0.2	34.6	35.6	19.2	15.2	0.0
LnGrp Delay(d),s/veh	59.5	38.9	0.0	282.8	56.2	0.0	117.3	183.7	196.2	204.8	29.6	0.0
LnGrp LOS	E	D		F	E		F	F	F	F	C	
Approach Vol, veh/h		484			950			1903			2351	
Approach Delay, s/veh		50.9			172.8			187.7			80.2	
Approach LOS		D			F			F			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	22.0	38.7	26.0	26.9	5.4	55.3	16.4	36.5
Change Period (Y+Rc), s	5.0	6.0	5.0	5.3	5.0	6.0	5.0	5.3
Max Green Setting (Gmax), s	17.0	32.7	21.0	28.0	4.5	45.2	14.2	34.8
Max Q Clear Time (g_c+I1), s	19.0	34.7	23.0	5.8	2.2	33.5	11.1	29.1
Green Ext Time (p_c), s	0.0	0.0	0.0	4.4	0.0	11.4	0.3	2.1

Intersection Summary	
HCM 2010 Ctrl Delay	129.1
HCM 2010 LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	70	730	336	320	1109	51	66	29	27	38	17	49
Future Volume (veh/h)	70	730	336	320	1109	51	66	29	27	38	17	49
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.99	1.00		0.79	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	80	839	386	368	1275	59	76	33	31	44	20	56
Adj No. of Lanes	1	3	0	2	2	1	2	1	0	1	1	1
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	97	1070	486	427	1362	601	124	279	262	56	664	559
Arrive On Green	0.05	0.32	0.32	0.12	0.38	0.38	0.04	0.36	0.36	0.03	0.36	0.36
Sat Flow, veh/h	1774	3390	1539	3442	3539	1563	3442	774	727	1774	1863	1570
Grp Volume(v), veh/h	80	839	386	368	1275	59	76	0	64	44	20	56
Grp Sat Flow(s),veh/h/ln	1774	1695	1539	1721	1770	1563	1721	0	1501	1774	1863	1570
Q Serve(g_s), s	4.9	24.6	25.1	11.5	37.9	2.6	2.4	0.0	3.1	2.7	0.8	2.6
Cycle Q Clear(g_c), s	4.9	24.6	25.1	11.5	37.9	2.6	2.4	0.0	3.1	2.7	0.8	2.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.48	1.00		1.00
Lane Grp Cap(c), veh/h	97	1070	486	427	1362	601	124	0	542	56	664	559
V/C Ratio(X)	0.82	0.78	0.79	0.86	0.94	0.10	0.61	0.00	0.12	0.78	0.03	0.10
Avail Cap(c_a), veh/h	97	1070	486	456	1377	608	126	0	542	65	664	559
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	51.2	34.1	34.2	47.0	32.4	21.5	52.0	0.0	23.4	52.6	22.9	23.5
Incr Delay (d2), s/veh	38.9	4.1	9.3	13.9	12.2	0.1	6.0	0.0	0.4	35.0	0.1	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.5	12.1	11.9	6.3	20.7	1.2	1.2	0.0	1.4	1.9	0.4	1.2
LnGrp Delay(d),s/veh	90.1	38.2	43.6	61.0	44.6	21.6	58.0	0.0	23.8	87.6	23.0	23.9
LnGrp LOS	F	D	D	E	D	C	E		C	F	C	C
Approach Vol, veh/h		1305			1702			140			120	
Approach Delay, s/veh		43.0			47.3			42.4			47.1	
Approach LOS		D			D			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	17.8	40.3	8.1	43.2	10.2	47.9	7.7	43.7
Change Period (Y+Rc), s	* 4.2	5.8	* 4.2	* 4.2	* 4.2	5.8	* 4.2	* 4.2
Max Green Setting (Gmax), s	* 15	34.1	* 4	* 39	* 6	42.6	* 4	* 39
Max Q Clear Time (g_c+I1), s	13.5	27.1	4.4	4.6	6.9	39.9	4.7	5.1
Green Ext Time (p_c), s	0.1	6.7	0.0	0.4	0.0	2.2	0.0	0.4

Intersection Summary	
HCM 2010 Ctrl Delay	45.4
HCM 2010 LOS	D

Notes

Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Vol, veh/h	13	804	1423	18	14	57
Future Vol, veh/h	13	804	1423	18	14	57
Conflicting Peds, #/hr	10	0	0	10	10	10
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	240	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	14	865	1530	19	15	61

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	1559	0	-	0	1924	795
Stage 1	-	-	-	-	1550	-
Stage 2	-	-	-	-	374	-
Critical Hdwy	4.14	-	-	-	6.29	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	6.04	-
Follow-up Hdwy	2.22	-	-	-	3.67	3.32
Pot Cap-1 Maneuver	420	-	-	-	78	330
Stage 1	-	-	-	-	158	-
Stage 2	-	-	-	-	630	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	416	-	-	-	74	324
Mov Cap-2 Maneuver	-	-	-	-	74	-
Stage 1	-	-	-	-	156	-
Stage 2	-	-	-	-	603	-

Approach	EB	WB	SB
HCM Control Delay, s	0.2	0	35.1
HCM LOS			E

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	416	-	-	-	194
HCM Lane V/C Ratio	0.034	-	-	-	0.394
HCM Control Delay (s)	14	-	-	-	35.1
HCM Lane LOS	B	-	-	-	E
HCM 95th %tile Q(veh)	0.1	-	-	-	1.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	132	176	221	23	31	93	510	1571	177	591	1241	99
Future Volume (veh/h)	132	176	221	23	31	93	510	1571	177	591	1241	99
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.95	1.00		0.95	1.00		0.97	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	135	180	226	23	32	95	520	1603	181	603	1266	101
Adj No. of Lanes	2	2	1	1	1	1	1	3	0	2	3	1
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	216	776	331	41	334	570	518	1757	198	656	1416	527
Arrive On Green	0.06	0.22	0.22	0.02	0.18	0.18	0.29	0.38	0.38	0.19	0.28	0.28
Sat Flow, veh/h	3442	3539	1509	1774	1863	1496	1774	4624	521	3442	5085	1535
Grp Volume(v), veh/h	135	180	226	23	32	95	520	1174	610	603	1266	101
Grp Sat Flow(s),veh/h/ln	1721	1770	1509	1774	1863	1496	1774	1695	1755	1721	1695	1535
Q Serve(g_s), s	4.2	4.6	15.1	1.4	1.6	4.7	32.0	36.0	36.2	18.8	26.2	5.1
Cycle Q Clear(g_c), s	4.2	4.6	15.1	1.4	1.6	4.7	32.0	36.0	36.2	18.8	26.2	5.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.30	1.00		1.00
Lane Grp Cap(c), veh/h	216	776	331	41	334	570	518	1288	667	656	1416	527
V/C Ratio(X)	0.62	0.23	0.68	0.56	0.10	0.17	1.00	0.91	0.91	0.92	0.89	0.19
Avail Cap(c_a), veh/h	220	1002	427	97	510	712	518	1288	667	660	1416	527
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	50.1	35.2	39.3	53.0	37.5	23.2	38.8	32.2	32.3	43.5	38.0	25.4
Incr Delay (d2), s/veh	5.3	0.2	3.0	11.7	0.1	0.1	40.3	11.2	19.2	18.0	9.0	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.1	2.3	6.5	0.8	0.8	1.9	21.4	18.8	21.0	10.6	13.4	2.3
LnGrp Delay(d),s/veh	55.3	35.3	42.3	64.6	37.6	23.3	79.1	43.5	51.5	61.5	47.0	26.2
LnGrp LOS	E	D	D	E	D	C	F	D	D	E	D	C
Approach Vol, veh/h		541			150			2304			1970	
Approach Delay, s/veh		43.2			32.7			53.6			50.4	
Approach LOS		D			C			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	25.9	47.1	7.5	29.0	37.0	36.0	11.9	24.6
Change Period (Y+Rc), s	5.0	5.5	5.0	5.0	5.0	5.5	5.0	5.0
Max Green Setting (Gmax), s	21.0	41.5	6.0	31.0	32.0	30.5	7.0	30.0
Max Q Clear Time (g_c+I1), s	20.8	38.2	3.4	17.1	34.0	28.2	6.2	6.7
Green Ext Time (p_c), s	0.1	3.3	0.0	2.1	0.0	2.3	0.0	2.5

Intersection Summary	
HCM 2010 Ctrl Delay	50.6
HCM 2010 LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	464	421	3	436	355	507	9	1687	516	634	1390	460
Future Volume (veh/h)	464	421	3	436	355	507	9	1687	516	634	1390	460
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.97	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	483	439	0	454	370	0	9	1757	538	660	1448	0
Adj No. of Lanes	2	3	1	1	1	1	1	3	0	2	3	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	524	1057	329	313	432	367	15	1217	359	406	2154	671
Arrive On Green	0.15	0.21	0.00	0.18	0.23	0.00	0.01	0.31	0.31	0.12	0.42	0.00
Sat Flow, veh/h	3442	5085	1583	1774	1863	1583	1774	3871	1141	3442	5085	1583
Grp Volume(v), veh/h	483	439	0	454	370	0	9	1530	765	660	1448	0
Grp Sat Flow(s),veh/h/ln	1721	1695	1583	1774	1863	1583	1774	1695	1622	1721	1695	1583
Q Serve(g_s), s	16.1	8.7	0.0	20.5	22.1	0.0	0.6	36.5	36.5	13.7	26.7	0.0
Cycle Q Clear(g_c), s	16.1	8.7	0.0	20.5	22.1	0.0	0.6	36.5	36.5	13.7	26.7	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.70	1.00		1.00
Lane Grp Cap(c), veh/h	524	1057	329	313	432	367	15	1065	510	406	2154	671
V/C Ratio(X)	0.92	0.42	0.00	1.45	0.86	0.00	0.58	1.44	1.50	1.63	0.67	0.00
Avail Cap(c_a), veh/h	524	1226	382	313	494	420	69	1065	510	406	2154	671
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	48.5	39.9	0.0	47.8	42.7	0.0	57.4	39.8	39.8	51.2	27.0	0.0
Incr Delay (d2), s/veh	21.7	0.3	0.0	219.5	12.6	0.0	30.5	201.8	235.1	292.7	1.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.2	4.1	0.0	29.1	12.9	0.0	0.4	46.9	49.6	23.0	12.8	0.0
LnGrp Delay(d),s/veh	70.3	40.1	0.0	267.4	55.3	0.0	87.9	241.6	274.9	343.9	28.7	0.0
LnGrp LOS	E	D		F	E		F	F	F	F	C	
Approach Vol, veh/h		922			824			2304			2108	
Approach Delay, s/veh		55.9			172.2			252.1			127.4	
Approach LOS		E			F			F			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	18.7	42.5	25.5	29.4	6.0	55.2	22.7	32.2
Change Period (Y+Rc), s	5.0	6.0	5.0	5.3	5.0	6.0	5.0	5.3
Max Green Setting (Gmax), s	13.7	36.5	20.5	28.0	4.5	45.7	17.7	30.8
Max Q Clear Time (g_c+I1), s	15.7	38.5	22.5	10.7	2.6	28.7	18.1	24.1
Green Ext Time (p_c), s	0.0	0.0	0.0	5.0	0.0	16.5	0.0	2.8

Intersection Summary	
HCM 2010 Ctrl Delay	169.3
HCM 2010 LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	123	1267	181	133	821	64	322	82	145	92	33	123
Future Volume (veh/h)	123	1267	181	133	821	64	322	82	145	92	33	123
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.99	1.00		0.83	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	152	1564	223	164	1014	79	398	101	179	114	41	152
Adj No. of Lanes	1	3	0	2	2	1	2	1	0	1	1	1
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	158	1719	244	215	1264	557	411	179	318	138	550	457
Arrive On Green	0.09	0.38	0.38	0.06	0.36	0.36	0.12	0.34	0.34	0.08	0.29	0.29
Sat Flow, veh/h	1774	4479	637	3442	3539	1561	3442	533	944	1774	1863	1550
Grp Volume(v), veh/h	152	1183	604	164	1014	79	398	0	280	114	41	152
Grp Sat Flow(s),veh/h/ln	1774	1695	1725	1721	1770	1561	1721	0	1476	1774	1863	1550
Q Serve(g_s), s	11.3	43.7	43.9	6.2	34.1	4.5	15.2	0.0	20.5	8.4	2.1	10.1
Cycle Q Clear(g_c), s	11.3	43.7	43.9	6.2	34.1	4.5	15.2	0.0	20.5	8.4	2.1	10.1
Prop In Lane	1.00		0.37	1.00		1.00	1.00		0.64	1.00		1.00
Lane Grp Cap(c), veh/h	158	1301	662	215	1264	557	411	0	497	138	550	457
V/C Ratio(X)	0.96	0.91	0.91	0.76	0.80	0.14	0.97	0.00	0.56	0.83	0.07	0.33
Avail Cap(c_a), veh/h	158	1301	662	320	1339	590	411	0	497	209	550	457
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	60.0	38.6	38.6	61.0	38.3	28.8	57.9	0.0	35.9	60.1	33.6	36.4
Incr Delay (d2), s/veh	59.0	9.8	17.3	2.7	3.7	0.2	35.7	0.0	4.6	9.1	0.3	1.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.1	22.1	24.0	3.0	17.3	2.0	9.3	0.0	9.0	4.5	1.1	4.6
LnGrp Delay(d),s/veh	119.0	48.3	56.0	63.7	42.0	28.9	93.6	0.0	40.4	69.2	33.9	38.4
LnGrp LOS	F	D	E	E	D	C	F		D	E	C	D
Approach Vol, veh/h		1939			1257			678			307	
Approach Delay, s/veh		56.3			44.0			71.7			49.2	
Approach LOS		E			D			E			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.5	56.5	20.0	43.2	16.0	53.0	14.5	48.7
Change Period (Y+Rc), s	* 4.2	5.8	* 4.2	* 4.2	* 4.2	5.8	* 4.2	* 4.2
Max Green Setting (Gmax), s	* 13	49.5	* 16	* 39	* 12	50.0	* 16	* 39
Max Q Clear Time (g_c+I1), s	10.2	45.9	17.2	12.1	13.3	36.1	10.4	22.5
Green Ext Time (p_c), s	0.1	3.5	0.0	1.8	0.0	11.1	0.1	1.6

Intersection Summary	
HCM 2010 Ctrl Delay	54.5
HCM 2010 LOS	D

Notes

Intersection	
Int Delay, s/veh	1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Vol, veh/h	39	1474	973	18	15	45
Future Vol, veh/h	39	1474	973	18	15	45
Conflicting Peds, #/hr	10	0	0	10	10	10
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	240	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	45	1714	1131	21	17	52

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	1162	0	-	0	1928	596
Stage 1	-	-	-	-	1152	-
Stage 2	-	-	-	-	776	-
Critical Hdwy	4.14	-	-	-	6.29	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	6.04	-
Follow-up Hdwy	2.22	-	-	-	3.67	3.32
Pot Cap-1 Maneuver	597	-	-	-	77	447
Stage 1	-	-	-	-	257	-
Stage 2	-	-	-	-	386	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	591	-	-	-	70	439
Mov Cap-2 Maneuver	-	-	-	-	70	-
Stage 1	-	-	-	-	255	-
Stage 2	-	-	-	-	353	-

Approach	EB	WB	SB
HCM Control Delay, s	0.3	0	34.8
HCM LOS			D

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	591	-	-	-	189
HCM Lane V/C Ratio	0.077	-	-	-	0.369
HCM Control Delay (s)	11.6	-	-	-	34.8
HCM Lane LOS	B	-	-	-	D
HCM 95th %tile Q(veh)	0.2	-	-	-	1.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	403	202	421	211	220	525	250	1280	90	237	1651	116
Future Volume (veh/h)	403	202	421	211	220	525	250	1280	90	237	1651	116
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.95	1.00		0.95	1.00		0.97	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	433	217	453	227	237	565	269	1376	97	255	1775	125
Adj No. of Lanes	2	2	1	1	1	1	1	3	0	2	3	1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	459	885	377	237	466	527	293	1702	120	324	1428	642
Arrive On Green	0.13	0.25	0.25	0.13	0.25	0.25	0.16	0.35	0.35	0.09	0.28	0.28
Sat Flow, veh/h	3442	3539	1510	1774	1863	1510	1774	4841	341	3442	5085	1535
Grp Volume(v), veh/h	433	217	453	227	237	565	269	964	509	255	1775	125
Grp Sat Flow(s),veh/h/ln	1721	1770	1510	1774	1863	1510	1774	1695	1792	1721	1695	1535
Q Serve(g_s), s	15.0	5.9	30.0	15.3	13.1	30.0	17.9	30.9	30.9	8.7	33.7	6.2
Cycle Q Clear(g_c), s	15.0	5.9	30.0	15.3	13.1	30.0	17.9	30.9	30.9	8.7	33.7	6.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.19	1.00		1.00
Lane Grp Cap(c), veh/h	459	885	377	237	466	527	293	1192	630	324	1428	642
V/C Ratio(X)	0.94	0.25	1.20	0.96	0.51	1.07	0.92	0.81	0.81	0.79	1.24	0.19
Avail Cap(c_a), veh/h	459	885	377	237	466	527	293	1192	630	602	1428	642
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	51.6	36.0	45.0	51.7	38.7	39.5	49.3	35.2	35.2	53.2	43.2	22.4
Incr Delay (d2), s/veh	28.3	0.1	112.8	47.1	0.9	60.1	32.3	6.0	10.7	4.2	115.4	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.9	2.9	24.3	10.6	6.8	26.2	11.4	15.4	17.2	4.3	31.0	2.8
LnGrp Delay(d),s/veh	79.8	36.1	157.8	98.8	39.6	99.7	81.6	41.2	46.0	57.4	158.6	23.1
LnGrp LOS	E	D	F	F	D	F	F	D	D	E	F	C
Approach Vol, veh/h		1103			1029			1742			2155	
Approach Delay, s/veh		103.3			85.6			48.8			138.7	
Approach LOS		F			F			D			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	16.3	47.7	21.0	35.0	24.8	39.2	21.0	35.0
Change Period (Y+Rc), s	5.0	5.5	5.0	5.0	5.0	5.5	5.0	5.0
Max Green Setting (Gmax), s	21.0	32.5	16.0	30.0	19.8	33.7	16.0	30.0
Max Q Clear Time (g_c+I1), s	10.7	32.9	17.3	32.0	19.9	35.7	17.0	32.0
Green Ext Time (p_c), s	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	97.2
HCM 2010 LOS	F