UCI

FINAL

TIERED INITIAL STUDY &

MITIGATED NEGATIVE DECLARATION

Interdisciplinary Science and Engineering Building

August 2017

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1.1 Project Title

Interdisciplinary Science and Engineering Building

1.2 Lead Agency Name and Address

University of California, Irvine
Office of Environmental Planning and Sustainability
4199 Campus Drive, Suite 380, Irvine, CA 92697-2325

1.3 Contact Person and Phone Number

Richard Demerjian, Assistant Vice Chancellor
(949) 824-7058

1.4 Project Location

The University of California, Irvine (UCI) is located in the city of Irvine, Orange County, California approximately four miles inland from the Pacific Ocean (see Exhibit 1-1). The project site is located in the Physical Sciences Quad of the UCI Academic Core adjacent to East Peltason and South View Circle Drives.

1.5 Custodian of the Administrative Record

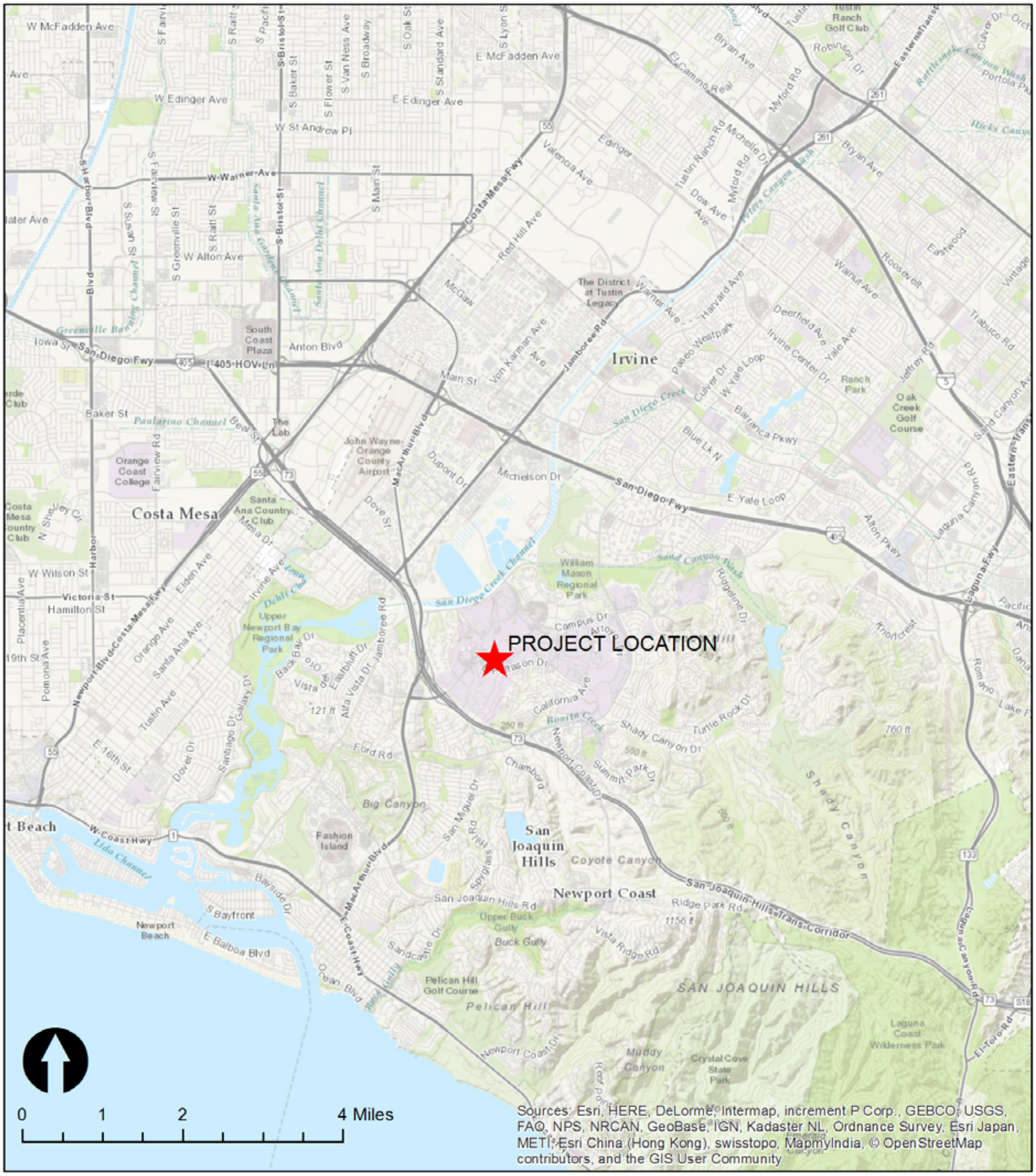
University of California, Irvine
Office of Environmental Planning and Sustainability
4199 Campus Drive, Suite 380, Irvine, CA 92697-2325

1.6 Documents Incorporated by Reference

The University of California, Irvine Long Range Development Plan (LRDP, UCI, 2007) is a comprehensive land use plan, based on projections through horizon year 2026, which guides campus growth. It provides policies and guidelines to support key academic and student life goals, identifies development objectives, delineates campus land uses, and estimates new building space needed to support project program expansion.

The Long Range Development Plan Environmental Impact Report (LRDP EIR, PBS&J, 2007) analyzes potential environmental impacts associated with the implementation of the 2007 LRDP pursuant to California Environmental Quality Act (CEQA) Guidelines Sections 15152 and 15168. This document is used to tier subsequent environmental analyses, including this Initial Study/Mitigated Negative Declaration (IS/MND), for campus development.

Exhibit 1-1
Regional Location



2.0 PROJECT DESCRIPTION

2.1 Environmental Setting and Surrounding Land Uses

The proposed project site is located in the Physical Sciences Quad within the Academic Core of the University of California, Irvine (UCI) campus. Surrounding on-campus uses include the Physical Sciences Lecture Hall (PSLH) and Physical Sciences Classroom Building (PSCB) located north of the project site; Lot 12A, Physical Sciences High Bay, and Croul Hall to the west; Multipurpose Science and Technology Building (MSTB) to the south; and the University Club to the east. The existing on-site use is surface parking, Lot 12B (see Exhibits 2-1 and 2-2).

2.2 Description of Project

The proposed project would demolish the north portion of the existing Lot 12B to construct an up to 200,000-gross-square-foot (GSF) structure (see Exhibit 2-3). It would consist of research and instruction space to integrate faculty, students, and staff from UCI's School of Physical Sciences, Donald Bren School of Information and Computer Science, and Henry Samueli School of Engineering to collaborate on research programs focusing on the convergence of science and engineering in health, medicine, and the environment (i.e., water, air, energy, and climate). As shown in Table 2.1-1, the building would include wet laboratory, office, classroom, auditorium, and support space. Approximately 50,000 GSF would be constructed as unfinished shell space to be completed and occupied following initial building occupancy. The analysis in this IS/MND addresses the completion and occupancy of the entire structure, including buildout of the shell space.

Table 2.1-1
Space Breakdown (GSF)

Space Type	GSF	% of Total GSF
Wet Laboratory	102,000	51%
Office	72,000	36%
Classroom/Auditorium	22,000	11%
Building Support/Storage	4,000	2%
Total (GSF)	**200,000**	**100%**

The proposed structure would be eight stories with an additional mechanical penthouse and basement level and would consist primarily of concrete, brick, or stone masonry consistent with the architectural design guidelines in the UCI Physical Design Framework (see Exhibits 2-4 and 2-5). Site improvements would include paving and landscaping to the Physical Sciences pedestrian mall, between the project building and PSCB and PSLH, and along the edge of the project site. The existing service road located to the east of the project site would also be realigned and widened.

Exhibit 2-1
Project Location and Adjacent Land Uses

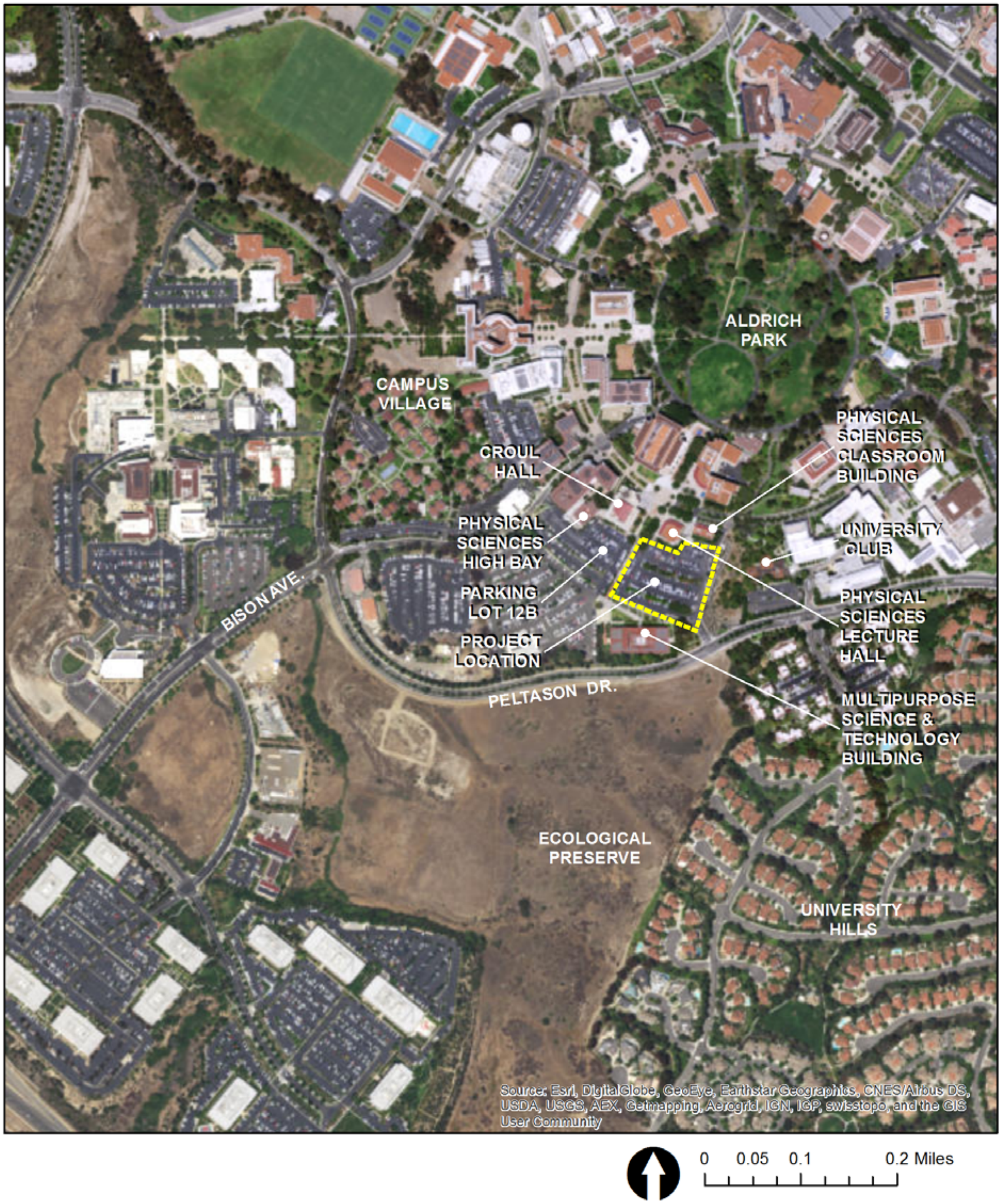


Exhibit 2-2
Existing Project Views

View 1: Southwest boundary of the project site looking northwest toward Croul Hall.

View 2: Southwest corner of the project site looking north toward the project site.

View 3: Southwest corner of the project site looking southeast toward MSTB.

View 4: Northwest corner of the project site looking north toward the Physical Sciences pedestrian mall.

View 5: Northwest corner of the project site looking east toward PSCB.

View 6: Southeast corner of project site looking southeast toward South Circle View Drive.

Exhibit 2-3
Conceptual Site Plan

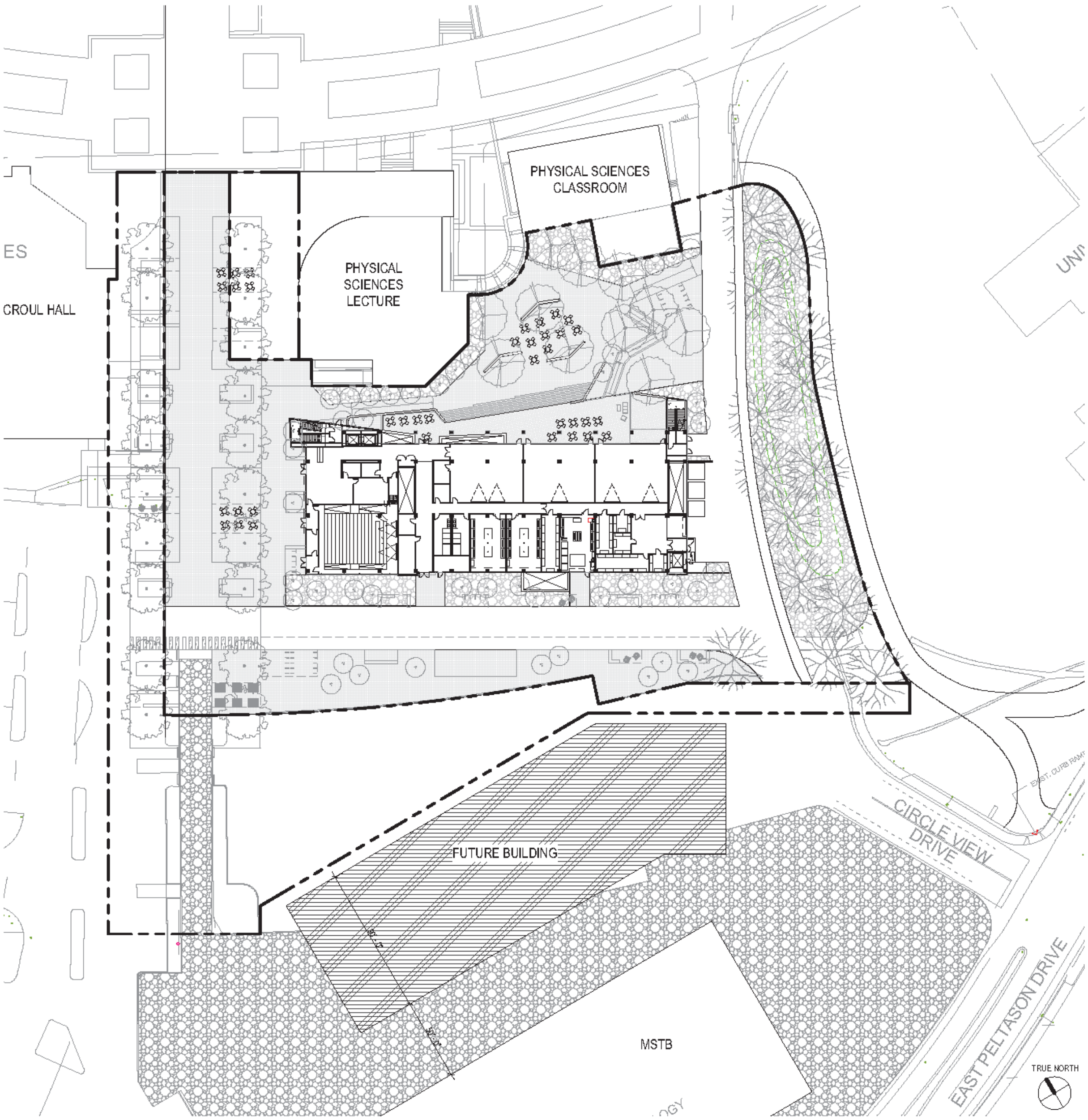


Exhibit 2-4
Conceptual Perspective

Exhibit 2-5
Conceptual Elevations

Per Section A, Green Building Design, of the UC Sustainable Practices Policy, the proposed project would meet or exceed LEED Gold equivalency and comply with Laboratories for the 21st Century (Labs 21) Environmental Performance Criteria and California Green Building Standards Code (Cal Green). The project would incorporate measures resulting in significant energy savings, construction waste reduction, recycled material use, and water conservation. Such features would include an overall energy efficiency that exceeds California Title 24 criteria by at least 20 percent. To achieve this goal, the design-build team would evaluate and explore the following measures, including, but not limited to: photovoltaics, radiant floor heating and cooling, passive and active chilled beams, energy efficient lighting, living walls, rainwater collection, minimizing natural gas combustion systems through use of electric powered thermal systems, lifecycle analysis of building materials and systems, sustainable landscaping, high-performance glazing, insulation and radiant barrier, high reflectance roofing materials, energy control systems, efficient exhaust fans, and high efficiency air conditioning equipment where applicable. Construction and operation of the proposed project would increase the amount of greenhouse gas emissions generated by the campus. However, as discussed further in Section 4.6, Greenhouse Gas Emissions, the project would not impede the campus' ability to reduce emissions as required by the UC Carbon Neutrality Initiative and Section A of the UC Sustainable Practices policy.

2.2.1 Project Phasing and Site Development

Project construction is anticipated to begin in spring 2018 and would occur over 24 months with anticipated completion and occupancy in spring 2020. Demolition of Lot 12B would occur in the first two weeks, site grading over the following month, and construction over the next 22 months. Total estimated export of on-site earthwork would be approximately 15,000 cubic yards. Demolition of the project site includes removal of existing Lot 12B, including paving, landscaping, and lighting. Appropriate acoustical and visual buffers, as determined during the final design stages, would be utilized during project construction to minimize potential project related aesthetic and/or noise impacts to existing sensitive receptors in the project vicinity.

2.2.2 Access

Staging is proposed to occur on or adjacent to the project site and in a remote contractor parking and staging area located near Bison Avenue. Site access and haul routes during construction would be along Bison Avenue, East Peltason, and South Circle View Drive.

Operational vehicle access would occur via Bison Avenue, East Peltason Drive, and South Circle View Drive. Parking Lots 12B, Lot 16, and other campus parking facilities would serve staff, student, and visitor parking. On-site pedestrian and bicycle access patterns would be maintained as part of the project with improvements to the Physical Sciences pedestrian mall and Physical Sciences service road.

The existing on-site Lot 12B, which serves campus commuters and visitors, would be removed as part of the proposed project resulting in the temporary loss of approximately 323 parking spaces during construction and the permanent loss of approximately 223 parking spaces. Replacement parking would be provided in Lot 16 and in additional surface parking lots and structures in the surrounding areas of the campus. To address campus-wide parking demand, including in the Physical Sciences Quad, a new approximately 1,000 space surface parking lot is currently proposed at the intersection of Bison Avenue and Health Sciences Drive. The environmental effects of the proposed Bison Avenue Surface Parking Lot project are analyzed in a separate IS/MND (SCH# 2017061043).

2.2.3 Utilities

Initial analyses indicate that existing campus utility systems have adequate capacity to serve the project and are available in the project vicinity. Chilled water, high temperature water, main electrical power, telecommunications, and natural gas are proposed to be provided through an extension of the existing utility tunnel located in the Physical Sciences Mall, approximately 150 feet north of the project site. Sanitary sewer service would be extended to connect to an existing 12-inch UCI sewer line south of the project site. Potable water and recycled water service would be provided through connection to a 12-inch potable water main south of the project site, and a six-inch recycled water main south of the site. Fire protection would be extended from existing services northeast and south of the site per all applicable Federal, state, and local fire codes. Storm drainage would be collected and treated on site through best management practices (BMPs), then conveyed to an existing 48-inch storm drain located northeast of the project site. If any existing connections conflict with the project design, alternative and/or temporary utilities would be provided to all adjacent structures during relocation.

2.3 Consistency with the LRDP

The applicable land use plan is the 2007 LRDP and the University is the only agency with land use jurisdiction over projects located on the campus. The project site is designated as Academic and Support in the LRDP, which allows for academic research uses. Furthermore, the up to 200,000 GSF proposed for the building is within the total space program identified for the Academic Core in the LRDP and analyzed in the LRDP EIR. Therefore, the project is consistent with the 2007 LRDP.

2.4 Discretionary Approval Authority and Other Public Agencies Whose Approval Is Required

Lead Agency

University of California

As a public agency principally responsible for approving or carrying out the proposed project, the University of California is the Lead Agency under CEQA and is responsible for reviewing and certifying the adequacy of the IS/MND and approving the proposed project. The Board of Regents of the University of California (The Regents) will consider design and CEQA approval of the proposed project in September 2017.

3.0 DETERMINATION

On the basis of the initial study that follows:

	I find that the proposed project meets the criteria for the Section 15332 In-Fill Development Project Class 32 exemption and is CATEGORICALLY EXEMPT from the provisions of CEQA.
	I find that the proposed project WOULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.
X	I find that although the proposed project could have a significant effect on the environment, the project impacts were adequately addressed in an earlier document or there will not be a significant effect in this case because revisions in the project have been made that will avoid or reduce any potential significant effects to a less than significant level. A MITIGATED NEGATIVE DECLARATION will be prepared.
	I find that the proposed project MAY have a significant effect on the environment. An ENVIRONMENTAL IMPACT REPORT will be prepared.

8-23-17

Signature

Date

Printed Name

For

4.0 EVALUATION OF ENVIRONMENTAL IMPACTS

The University has defined the column headings in the Initial Study checklist as follows:

- **"Potentially Significant Impact"** is appropriate if there is substantial evidence that the project's effect may be significant. If there are one or more "Potentially Significant Impacts," a Project EIR will be prepared.
- **"Project Impact Adequately Addressed in LRDP EIR"** applies where the potential impacts of the proposed project were adequately addressed in the LRDP EIR and mitigation measures identified in the LRDP EIR will mitigate any impacts of the proposed project to the extent feasible. All applicable LRDP EIR mitigation measures are incorporated into the project as proposed. The impact analysis in this document summarizes and cross-references (including section/page numbers) the relevant analysis in the LRDP EIR.
- **"Less Than Significant with Project-level Mitigation Incorporated"** applies where the incorporation of project-specific mitigation measures will reduce an effect from "Potentially Significant Impact" to a "Less Than Significant Impact." All project-level mitigation measures must be described, including a brief explanation of how the measures reduce the effect to a less than significant level.
- **"Less Than Significant Impact"** applies where the project will not result in any significant effects. The effects may or may not have been discussed in the LRDP EIR. The project impact is less than significant without the incorporation of LRDP or project-level mitigation.
- **"No Impact"** applies where a project would not result in any impact in the category or the category does not apply. Information is provided to show that the impact does not apply to projects like the one involved (e.g., the project falls outside a fault rupture zone). A "No Impact" answer may be 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).

4.1 Aesthetics

Issues	Potentially Significant Impact	Project Impact Adequately Addressed in LRDP EIR	Less Than Significant with Project-level Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:					
a) Have a substantial adverse effect on a scenic vista?					X
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?					X
c) Substantially degrade the existing visual character or quality of the site and its surroundings?				X	
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?		X			

Discussion

Aesthetics issues are discussed in Section 4.1 of the 2007 LRDP EIR.

a) Scenic Vista: No Impact

There are no identified scenic vistas surrounding the project site or anywhere else on campus (LRDP EIR, page 4.1-6). Furthermore, the project site is in the UCI Academic Core, which has been previously developed with compatible uses consisting of academic buildings, parking lots, and support facilities. Therefore, the proposed project would not affect a scenic vista and no impact would occur. No mitigation is required.

b) Scenic Resources within a State Scenic Highway: No Impact

The California Scenic Highway Mapping System indicates that there are no Officially Designated

State Scenic Highways located within proximity to the project site.[1] The closest Eligible State Scenic Highway – Not Officially Designated, Pacific Coast Highway, is located more than three miles southwest. Therefore, the proposed project would not affect scenic resources within a state highway and no impact would occur. No mitigation is required.

c) Visual Character: Less than Significant Impact

The proposed structure would be eight stories with an additional mechanical penthouse constructed primarily of concrete, brick, or stone masonry consistent with the architectural design guidelines in the UCI Physical Design Framework. All areas adjacent to the project site are urbanized and built out with academic and support facilities, including multi-story buildings constructed with similar materials. Therefore, the proposed project would retain the visual character of the campus and impacts would be less than significant. No mitigation is required.

d) Light or Glare: Project Impact Adequately Addressed in the LRDP EIR

The proposed project would include outdoor lighting to provide safe levels of illuminations for pedestrians and bicyclists, such as exterior building mounted fixtures. However, the project site, which has been previously developed, already includes existing sources of light and the increase in ambient levels would be negligible. Furthermore, all outdoor surfaces would be designed in accordance with mitigation measure Aes-2A to reduce glare for passing motorists and pedestrians, and a lighting plan would be approved during pre-construction in accordance with mitigation measure Aes-2B. Therefore, with implementation of LRDP EIR mitigation measures Aes-2A and Aes-2B, potential impacts due to the creation of light and glare would be reduced to a less than significant level.

Mitigation Measures

Aes-2A: Prior to project design approval for future projects that implement the 2007 LRDP, UCI shall ensure that the projects include design features to minimize glare impacts. These design features shall include use of non-reflective exterior surfaces and low-reflectance glass (e.g., double or triple glazing glass, high technology glass, low-E glass, or equivalent materials with low reflectivity) on all project surfaces that could produce glare.

Aes-2B: Prior to approval of construction documents for future projects that implement the 2007 LRDP, UCI shall approve an exterior lighting plan for each project. In accordance with UCI's Campus Standards and Design Criteria for outdoor lighting, the plan shall include, but not be limited to, the following design features:

- Full-cutoff lighting fixtures to direct lighting to the specific location intended for illumination (e.g., roads, walkways, or recreation fields) and to minimize stray light spillover into adjacent residential areas, sensitive biological habitat, and other light-

[1] http://www.dot.ca.gov/hq/LandArch/16_livability/scenic_highways/index.htm. Accessed July 12, 2017.

sensitive receptors;

- Appropriate intensity of lighting to provide campus safety and security while minimizing light pollution and energy consumption; and
- Shielding direct lighting within parking areas, parking structures, or roadways away from adjacent residential areas, sensitive biological habitat, and other light-sensitive receptors through site configuration, grading, lighting design, or barriers such as earthen berms, walls, or landscaping.

4.2 Air Quality

Issues	Potentially Significant Impact	Project Impact Adequately Addressed in LRDP EIR	Less Than Significant with Project-level Mitigation Incorporated	Less Than Significant Impact	No Impact
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?					X
b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?			X		
c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?			X		
d) Expose sensitive receptors to substantial pollutant concentrations?				X	
e) Create objectionable odors affecting a substantial number of people?				X	

Discussion

Air quality issues are discussed in Section 4.2 of the 2007 LRDP EIR. A project-specific Air

Quality Assessment was prepared by Michael Baker International, Inc. and is included as Appendix A.

a) Air Quality Management Plan Consistency: No Impact

On March 3, 2017, the SCAQMD Governing Board approved the 2016 AQMP, which outlines its strategies for meeting the NAAQS for $PM_{2.5}$ and ozone. According to the SCAQMD CEQA Air Quality Handbook, in order to determine consistency with the AQMP, two main criteria must be addressed.

Criterion 1:

With respect to the first criterion, SCAQMD methodologies require that an air quality analysis for a project include forecasts of project emissions in relation to contributing to air quality violations and delay of attainment.

- Would the project result in an increase in the frequency or severity of existing air quality violations?

Since the consistency criteria identified under the first criterion pertain to pollutant concentrations, rather than to total regional emissions, an analysis of a project's pollutant emissions relative to localized pollutant concentrations is used as the basis for evaluating project consistency. As discussed in 4.2(d) below, localized concentrations of CO, NO_X, PM_{10}, and $PM_{2.5}$ would be less than significant during project operations. Therefore, the proposed project would not result in an increase in the frequency or severity of existing air quality violations. Because reactive organic gases (ROGs) are not a criteria pollutant, there is no ambient standard or localized threshold for ROGs. Due to the role ROG plays in ozone formation, it is classified as a precursor pollutant and only a regional emissions threshold has been established.

- Would the project cause or contribute to new air quality violations?

As discussed in 4.2(b) below, operations of the proposed project would result in emissions that would be below the SCAQMD operational thresholds. Therefore, the proposed project would not have the potential to cause or affect a violation of the ambient air quality standards.

- Would the project delay timely attainment of air quality standards or the interim emissions reductions specified in the AQMP?

The proposed project would result in less than significant impacts with regard to localized concentrations during project operations. Therefore, the proposed project would not delay the timely attainment of air quality standards or 2016 AQMP emissions reductions.

Criterion 2:

The SCAQMD's second criterion for determining project consistency focuses on whether or not the proposed project exceeds the assumptions utilized in preparing the forecasts presented in the 2016 AQMP. Determining whether or not a project exceeds the assumptions reflected in the

2016 AQMP involves the evaluation of the three criteria outlined below.

- Would the project be consistent with the population, housing, and employment growth projections utilized in the preparation of the AQMP?

In the case of the 2016 AQMP, several sources of data form the basis for the projections of air pollutant emissions including: the City of Irvine General Plan (General Plan), UCI's 2007 Long Range Development Plan (LRDP), SCAG's Growth Management Chapter of the Regional Comprehensive Plan (RCP), and SCAG's 2016-2040 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS). The RTP/SCS also provides socioeconomic forecast projections of regional population growth. The General Plan Land Use Map designates the project site as "Educational Facilities", and the LRDP designates the site as Academic and Support. According to the LRDP, the Academic and Support designation includes classrooms, instructional and research laboratories, undergraduate, graduate, and professional schools and programs, and additional support facilities such as administrative facilities, libraries, performance and cultural facilities, conference facilities, and services supporting academic operations. Other permitted uses in this category include food service, recreation, parking, utility infrastructure, and other support uses. The project proposes to construct a laboratory and research facility ranging from one to eight stories and totaling up to 200,000 GSF to be used by UCI faculty, student researchers and staff (adding a max of 70 faculty), and therefore complies with the site's intended use. Additionally, the project would be consistent with the City's General Plan and UCI's LRDP and assumed emissions for the project site, since no change in the site's land use designation is proposed. Thus, the project is generally consistent with the types, intensity, and patterns of land use envisioned for the site vicinity in the RCP. The population, housing, and employment forecasts, which are adopted by SCAG's Regional Council, are based on the local plans and policies applicable to the cities; these are used by SCAG in all phases of implementation and review. Additionally, as SCAQMD incorporated these same projections into the 2016 AQMP, it can be concluded that the project would be consistent with the projections. As a result, the project would not exceed growth assumptions within the City's General Plan and UCI's LRDP. Therefore, the project would be consistent with the 2016 AQMP and a less than significant impact would occur.

- Would the project implement all feasible air quality mitigation measures?

Compliance with all feasible emission reduction measures identified by the SCAQMD would be required as identified in 4.2(b) and 4.2(c) below. Therefore, the proposed project would meet this AQMP consistency criterion.

- Would the project be consistent with the land use planning strategies set forth in the AQMP?

The project is consistent with the LRDP land use designations for the site, and would serve to implement various LRDP policies. Compliance with emission reduction measures identified by the SCAQMD would be required as identified in 4.2(b) and 4.2(c). Therefore, the proposed project meets this AQMP consistency criterion.

In conclusion, the determination of 2016 AQMP consistency is primarily concerned with the long-term influence of a project on air quality in the Basin. The proposed project would not result in a long-term impact on the region's ability to meet State and federal air quality standards. Also, the proposed project would be consistent with the goals and policies of the AQMP for control of fugitive dust. As discussed above, the proposed project's long-term influence would also be consistent with the SCAQMD and SCAG's goals and policies and is, therefore, considered consistent with the 2016 AQMP. Therefore, the proposed project would not conflict with the AQMP and no impact would occur. No mitigation is required.

b) Air Quality Standards: Less Than Significant Impact with Project-level Mitigation Incorporated

Short-Term Construction

Short-term air quality impacts are predicted to occur during grading and construction operations associated with implementation of the proposed project. Temporary air emissions would result from the following activities:

- Particulate (fugitive dust) emissions from grading and building construction; and
- Exhaust emissions from the construction equipment and the motor vehicles of the construction crew.

Construction is expected to begin in April 2018 and last for a duration of 24 months. The project proposes to demolish a 160,000 GSF surface parking lot to develop a 200,000 GSF academic facility. Construction would involve activities associated with demolition of the paved area, grading, paving, building construction, and architectural coating. Site grading would require approximately 14,815 cubic yards of soil export off-site. Project construction equipment would include graders, dozers, and tractors/loaders/backhoes during grading; generator sets, rough terrain forklifts, cranes, tractors/loaders/backhoes, and welders during building construction; cement and mortar mixers, pavers, paving equipment, and rollers during paving; and air compressors during architectural coating. Emissions for each construction phase have been quantified based upon the phase durations and equipment types. The analysis of daily construction emissions has been prepared utilizing the California Emissions Estimator Model (CalEEMod) version 2016.3.1. Table 4.2-1, Short-Term (Construction) Emissions, presents the anticipated daily short-term construction emissions.

Fugitive Dust Emissions

Construction activities are a source of fugitive dust (PM_{10} and $PM_{2.5}$) emissions that may have a substantial, temporary impact on local air quality. In addition, fugitive dust may be a nuisance to those living and working in the project area. Fugitive dust emissions are associated with land clearing, ground excavation, cut-and-fill, and truck travel on unpaved roadways (including demolition as well as construction activities). Fugitive dust emissions vary substantially from day to day, depending on the level of activity, specific operations, and weather conditions.

Fugitive dust from grading and construction is expected to be short-term and would cease upon project completion. Additionally, most of this material is inert silicates, rather than the complex organic particulates released from combustion sources, which are more harmful to health.

Table 4.2-1
Short-Term (Construction) Emissions

Emissions Source	Pollutant (pounds/day)					
	ROG[3]	NO_X	CO	SO_2	PM_{10}	$PM_{2.5}$
2018						
Unmitigated Emissions	3.16	43.18	20.06	0.07	15.53	3.68
Mitigated Emissions	3.16	43.18	20.06	0.07	8.12	2.55
SCAQMD Thresholds	75	100	550	150	150	55
Is Threshold Exceeded After Mitigation?	***No***	***No***	***No***	***No***	***No***	***No***
2019						
Unmitigated Emissions	12.55	21.86	19.75	0.04	2.42	1.41
Mitigated Emissions	15.55	21.86	19.75	0.04	2.35	1.39
SCAQMD Thresholds	75	100	550	150	150	55
Is Threshold Exceeded After Mitigation?	***No***	***No***	***No***	***No***	***No***	***No***
2020						
Unmitigated Emissions	12.23	20.18	19.07	0.04	2.27	1.26
Mitigated Emissions	12.23	20.18	19.07	0.04	2.20	1.25
SCAQMD Thresholds	75	100	550	150	150	55
Is Threshold Exceeded After Mitigation?	***No***	***No***	***No***	***No***	***No***	***No***

Dust (larger than 10 microns) generated by such activities usually becomes more of a local nuisance than a serious health problem. Of particular health concern is the amount of PM_{10} (particulate matter smaller than 10 microns) generated as a part of fugitive dust emissions. PM_{10} poses a serious health hazard alone or in combination with other pollutants. Fine Particulate Matter ($PM_{2.5}$) is mostly produced by mechanical processes. These include automobile tire wear, industrial processes such as cutting and grinding, and re-suspension of particles from the ground or road surfaces by wind and human activities such as construction or agriculture. $PM_{2.5}$ is mostly derived from combustion sources, such as automobiles, trucks, and other vehicle exhaust, as well as from stationary sources. These particles are either directly emitted or are formed in the atmosphere from the combustion of gases such as NO_X and SO_X combining with ammonia. $PM_{2.5}$ components from material in the earth's crust, such as dust, are also present, with the amount varying in different locations.

Mitigation measure AQ-1 would require the project contractor to implement construction emissions Best Management Practices (BMPs) during construction, including, but not limited to, dust control techniques (i.e., daily watering), a traffic management plan, and adherence to SCAQMD Rules 402 and 403 (which require watering of inactive and perimeter areas, track out requirements, etc.), to reduce PM_{10} and $PM_{2.5}$ concentrations. These are standard dust control measures that the SCAQMD requires for all projects. As indicated in Table 4.2-1, total PM_{10} and $PM_{2.5}$ emissions would be below the SCAQMD threshold with the implementation of mitigation measure AQ-1. Therefore, particulate matter impacts during construction would be less than significant.

ROG Emissions

In addition to gaseous and particulate emissions, the application of asphalt and surface coatings creates ROG emissions, which are O_3 precursors. In accordance with the methodology prescribed by the SCAQMD, the ROG emissions associated with paving have been quantified with CalEEMod. Architectural coatings were also quantified with CalEEMod based upon the size of the buildings.

The highest concentration of ROG emissions would be generated during the application of architectural coatings on the building. As required by law, all architectural coatings for the proposed project structures would comply with SCAQMD Regulation XI, Rule 1113 – Architectural Coating. Rule 1113 provides specifications on painting practices as well as regulates the ROG content of paint. As shown in Table 4.2-1, project construction would not result in an exceedance of ROG emissions during any years of construction. Therefore, impacts would be less than significant.

Construction Equipment and Worker Vehicle Exhaust

Exhaust emissions from construction activities include emissions associated with the transport of machinery and supplies to and from the project site, emissions produced on-site as the equipment is used, and emissions from trucks transporting materials to and from the site. Standard SCAQMD regulations, such as maintaining all construction equipment in proper tune, shutting down equipment when not in use for extended periods of time, and implementing SCAQMD Rule 403 would be adhered to. As noted in Table 4.2-1, construction equipment exhaust would not exceed SCAQMD thresholds. Therefore, impacts are less than significant.

Naturally Occurring Asbestos

Asbestos is a term used for several types of naturally occurring fibrous minerals that are a human health hazard when airborne. The most common type of asbestos is chrysotile, but other types such as tremolite and actinolite are also found in California. Asbestos is classified as a known human carcinogen by State, Federal, and international agencies and was identified as a toxic air contaminant by the California Air Resources Board in 1986.

Asbestos can be released from serpentinite and ultramafic rocks when the rock is broken or crushed. At the point of release, the asbestos fibers may become airborne, causing air quality and human health hazards. These rocks have been commonly used for unpaved gravel roads, landscaping, fill projects, and other improvement projects in some localities. Asbestos may be released to the atmosphere due to vehicular traffic on unpaved roads, during grading for development projects, and at quarry operations. All of these activities may have the effect of releasing potentially harmful asbestos into the air. Natural weathering and erosion processes can act on asbestos bearing rock and make it easier for asbestos fibers to become airborne if such rock is disturbed. According to the Department of Conservation Division of Mines and Geology, A General Location Guide for Ultramafic Rocks in California – Areas More Likely to Contain Naturally Occurring Asbestos Report (August 2000), serpentinite and ultramafic rocks are not known to occur within the project area. Thus, there would be no impact in this regard.

Construction Odors

Potential odors could arise from the diesel construction equipment used on-site, as well as from architectural coatings and asphalt off-gassing. Odors generated from the referenced sources are common in the man-made environment and are not known to be substantially offensive to adjacent receptors. Additionally, odors generated during construction activities would be temporary and would decrease rapidly. Therefore, construction odors are not considered to be a significant impact.

Total Daily Construction Emissions

In accordance with the SCAQMD Guidelines, CalEEMod was utilized to model construction emissions for ROG, NO_X, CO, SO_X, PM_{10}, and $PM_{2.5}$. Construction of the proposed project would start in early 2018 and be completed in 24 months. The greatest emissions would be generated during the initial stages of construction. Additionally, the greatest amount of ROG emissions would typically occur during the final stages of development due to the application of architectural coatings.

CalEEMod allows the user to input mitigation measures such as watering the construction area to limit fugitive dust. Mitigation measures that were input into CalEEMod allow for certain reduction credits and result in a decrease of pollutant emissions. Reduction credits are based upon studies developed by CARB, SCAQMD, and other air quality management districts throughout California, and were programmed within CalEEMod. As indicated in Table 4.2-1, CalEEMod calculates the reduction associated with recommended mitigation measures. As depicted in Table 4.2-1, construction emissions would be less than significant with implementation of mitigation measure AQ-1. Therefore, construction related air emissions would be less than significant.

Long-Term Operational Emissions

Mobile Source Emissions

Mobile sources are emissions from motor vehicles, including tailpipe and evaporative emissions. Depending upon the pollutant being discussed, the potential air quality impact may be of either regional or local concern. For example, ROG, NO_X, SO_X, PM_{10}, and $PM_{2.5}$ are all pollutants of regional concern (NO_X and ROG react with sunlight to form O_3 [photochemical smog], and wind currents readily transport SO_X, PM_{10}, and $PM_{2.5}$). However, CO tends to be a localized pollutant, dispersing rapidly at the source.

Project-generated vehicle emissions have been estimated using CalEEMod. Trip generation rates associated with the project were based on traffic data from Stantec Consulting Services who estimated during the initial analysis that the proposed project would result in approximately 193 new daily trips by 70 faculty and staff members, and is the number of trips used to calculate emissions for this air quality analysis. Since the initial traffic analysis, the number of anticipated daily trips was reduced from 193 to 113 (see Section 4.14, Transportation and Traffic), which would result in slightly lower emissions than estimated in the calculations below. Table 4.2-2, Long-Term Air Emissions, presents the estimated mobile source emissions. As shown in Table 4.2-2, mitigated emissions generated by vehicle traffic associated with the proposed project would not exceed established SCAQMD regional thresholds.

Table 4.2-2
Long-Term Air Emissions

Source	**Estimated Emissions (pounds/day)**					
	ROG	**NO_X**	**CO**	**SO_X**	**PM_{10}**	**$PM_{2.5}$**
Area Sources	4.47	0.00	0.02	0.00	0.00	0.00
Energy Sources	0.08	0.72	0.60	0.00	0.05	0.05
Mobile Sources	0.31	1.29	3.89	0.01	1.24	0.34
Total Emissions	4.86	2.01	4.51	0.01	1.29	0.39
SCAQMD Threshold	*55*	*55*	*550*	*150*	*150*	*55*
Is Threshold Exceeded? (Significant Impact)	**No**	**No**	**No**	**No**	**No**	**No**

Area Source Emissions

Area source emissions would be generated due to an increased demand for consumer products, architectural coating, and landscaping. As shown in Table 4.2-2, area source emissions from the proposed project would not exceed SCAQMD thresholds for ROG, NO_X, CO, SO_X, PM_{10}, or $PM_{2.5}$.

Energy Source Emissions

Energy source emissions would be generated as a result of electricity and natural gas (non-hearth) usage associated with the proposed project. The primary use of electricity and natural gas by the project would be for space heating and cooling, water heating, ventilation, lighting, appliances, and electronics. As shown in Table 4.2-2, energy source emissions from the proposed project would not exceed SCAQMD thresholds for ROG, NO_X, CO, SO_X, PM_{10}, or $PM_{2.5}$.

Conclusion

As indicated in Table 4.2-2, operational emissions from the proposed project would not exceed SCAQMD thresholds. If stationary sources, such as backup generators, are installed on-site, they would be required to obtain the applicable permits from SCAQMD for operation of such equipment. The SCAQMD is responsible for issuing permits for the operation of stationary sources in order to reduce air pollution, and to attain and maintain the national and California ambient air quality standards in the Basin. Backup generators would be used only in emergency situations, and would not contribute a substantial amount of emissions capable of exceeding SCAQMD thresholds. Therefore, with incorporation of mitigation measure AQ-1, air quality impacts would be less than significant.

c) *Cumulatively Considerable Net Increase of Any Criteria Pollutants: Less Than Significant Impact with Project-level Mitigation Incorporated*

With respect to the proposed project's construction-related air quality emissions and cumulative Basin-wide conditions, the SCAQMD has developed strategies to reduce criteria pollutant emissions outlined in the 2016 AQMP pursuant to Federal Clean Air Act mandates. As such, the proposed project would comply with SCAQMD Rule 403 requirements, and implement all feasible mitigation measures (AQ-1). Rule 403 requires that fugitive dust be controlled with the best available control measures in order to reduce dust so that it does not remain visible in the atmosphere beyond the property line of the proposed project. In addition, the proposed project would comply with adopted 2016 AQMP emissions control measures. Per SCAQMD rules and mandates, as well as the CEQA requirement that significant impacts be mitigated to the extent feasible, these same requirements (i.e., Rule 403 compliance, the implementation of all feasible mitigation measures, and compliance with adopted AQMP emissions control measures) would also be imposed on construction projects throughout the Basin, which would include related projects.

As discussed previously, the proposed project would not result in long-term air quality impacts, as emissions would not exceed the SCAQMD adopted operational thresholds. Additionally, adherence to SCAQMD rules and regulations would alleviate potential impacts related to cumulative conditions on a project-by-project basis. Emission reduction technology, strategies, and plans are constantly being developed. As a result, the proposed project would not contribute a cumulatively considerable net increase of any nonattainment criteria pollutant. Therefore, with incorporation of mitigation measure AQ-1, cumulative operational impacts associated with implementation of the proposed project would be less than significant.

d) *Sensitive Receptors: Less Than Significant Impact*

Sensitive receptors are defined as facilities or land uses that include members of the population that are particularly sensitive to the effects of air pollutants, such as children, the elderly, and people with illnesses. Examples of these sensitive receptors are residences, schools, hospitals, and daycare centers. CARB has identified the following groups of individuals as the most likely to be affected by air pollution: the elderly over 65, children under 14, athletes, and persons with cardiovascular and chronic respiratory diseases such as asthma, emphysema, and bronchitis.

On-campus sensitive receptors near the project site include surrounding residences adjacent to the north, east, and south of the project site. In order to identify impacts to sensitive receptors, the SCAQMD recommends addressing localized significance thresholds (LSTs) for construction and operations impacts (area sources only). The CO hotspot analysis following the LST analysis addresses localized mobile source impacts.

Localized Significance Thresholds (LST)

LSTs were developed in response to SCAQMD Governing Boards' Environmental Justice Enhancement Initiative (I-4). The SCAQMD provided the Final Localized Significance Threshold Methodology (dated June 2003 [revised 2008]) for guidance. The LST methodology assists lead agencies in analyzing localized air quality impacts. The SCAQMD provides the LST screening lookup tables for one, two, and five acre projects emitting CO, NO_X, $PM_{2.5}$, or PM_{10}. The LST methodology and associated mass rates are not designed to evaluate localized impacts from mobile sources traveling over the roadways. The SCAQMD recommends that any project over five acres should perform air quality dispersion modeling to assess impacts to nearby sensitive receptors. The project is located within Source Receptor Area (SRA) 20, Central Orange County Coastal.

Construction

The SCAQMD guidance on applying CalEEMod to LSTs specifies the amount of acres a particular piece of equipment would likely disturb per day. Based on the SCAQMD guidance on applying CalEEMod to LSTs, the project would disturb at most four acres of land per day. However, the SCAQMD provides thresholds for one, two, and five acre sites. Therefore, the LST thresholds for one acre was conservatively utilized for the construction LST analysis. The closest sensitive receptors to the project site are residential uses that are within 100 meters of the project site to the north, east, and south. These sensitive land uses may be potentially affected by air pollutant emissions generated during on-site construction activities. LST thresholds are provided for distances to sensitive receptors of 25, 50, 100, 200, and 500 meters. As the nearest sensitive uses are within 100 meters of the project site, the LST values for 100 meters were used. Table 4.2-3, Localized Significance of Construction Emissions, shows the localized unmitigated and mitigated construction-related emissions. It is noted that the localized emissions presented in Table 4.2-3 are less than those in Table 4.2-1 because localized emissions include only on-site emissions (i.e., from construction equipment and fugitive dust), and do not include off-site emissions (i.e., from hauling activities). As seen in Table 4.2-3, mitigated on-site emissions would not exceed the LSTs for SRA 20.

Operations

For project operations, the one acre threshold was conservatively utilized, as the footprint is approximately 0.75 acres. As the nearest sensitive uses are within 100 meters of the project site, the LST values for 100 meters were used. As seen in Table 4.2-4, Localized Significance of Operational Emissions, project-related mitigated operational area source emissions would be negligible and would be below the LSTs. As such, operational LST impacts would be less than significant in this regard.

Table 4.2-3
Localized Significance of Construction Emissions

Source	Pollutant (pounds/day)			
	NO_X	CO	PM_{10}	$PM_{2.5}$
2018				
Total Unmitigated On-Site Emissions[2]	24.36	15.11	14.28	3.29
Total Mitigated On-Site Emissions[2]	24.36	15.11	6.93	2.17
Localized Significance Threshold[1]	108	1,090	27	9
Thresholds Exceeded?	***No***	***No***	***No***	***No***
2019				
Total Unmitigated On-Site Emissions[3]	15.98	13.49	0.92	0.88
Total Mitigated On-Site Emissions[3]	15.98	13.49	0.92	0.88
Localized Significance Threshold[1]	108	1,090	27	9
Thresholds Exceeded?	***No***	***No***	***No***	***No***
2020				
Total Unmitigated On-Site Emissions[3]	14.79	13.19	0.80	0.77
Total Mitigated On-Site Emissions[3]	14.79	13.19	0.80	0.77
Localized Significance Threshold[1]	108	1,090	27	9
Thresholds Exceeded?	***No***	***No***	***No***	***No***

Table 4.2-4
Localized Significance of Operational Emissions

Source	Pollutant (pounds/day)			
	NO_X	CO	PM_{10}	$PM_{2.5}$
Total Unmitigated Area Source Emissions	0.00	0.02	0.00	0.00
Localized Significance Threshold[1]	*108*	*1,090*	*27*	*9*
Thresholds Exceeded?	***No***	***No***	***No***	***No***

Carbon Monoxide Hotspots

Intersection Hotspots

CO emissions are a function of vehicle idling time, meteorological conditions, and traffic flow. Under certain extreme meteorological conditions, CO concentrations near a congested roadway or intersection may reach unhealthful levels (i.e., adversely affecting residents, school children, hospital patients, the elderly, etc.).

The SCAQMD requires a quantified assessment of CO hotspots when a project increases the volume-to-capacity ratio (also called the intersection capacity utilization) by 0.02 (two percent) for any intersection with an existing level of service LOS D or worse. Because traffic congestion is highest at intersections where vehicles queue and are subject to reduced speeds, these hot spots are typically produced at intersections.

The project is located in the South Coast Air Basin (Basin), which is designated as an attainment/maintenance area for the Federal CO standards and an attainment area for State standards. There has been a decline in CO emissions even though vehicle miles traveled on U.S. urban and rural roads have increased. On-road mobile source CO emissions have declined 24 percent between 1989 and 1998, despite a 23 percent rise in motor vehicle miles traveled over the same 10 years. California trends have been consistent with national trends; CO emissions declined 20 percent in California from 1985 through 1997 while vehicle miles traveled increased 18 percent in the 1990s. CO emissions have continued to decline since this time. The Basin was re-designated as attainment in 2007, and is no longer addressed in the SCAQMD’s AQMP. Three major control programs have contributed to the reduced per-vehicle CO emissions: exhaust standards, cleaner burning fuels, and motor vehicle inspection/maintenance programs.

A detailed CO analysis was conducted in the Federal Attainment Plan for Carbon Monoxide (CO Plan) for the SCAQMD’s 2003 Air Quality Management Plan.The 2003 Air Quality Management Plan is the most recent AQMP that addresses CO concentrations. The locations selected for microscale modeling in the CO Plan are worst-case intersections in the Basin, and would likely experience the highest CO concentrations. Thus, CO analysis within the CO Plan is utilized in a comparison to the proposed project, since it represents a worst-case scenario with heavy traffic volumes within the Basin.

Of these locations, the Wilshire Boulevard/Veteran Avenue intersection in Los Angeles experienced the highest CO concentration (4.6 parts per million [ppm]), which is well below the 35-ppm 1-hr CO Federal standard. The Wilshire Boulevard/Veteran Avenue intersection is one of the most congested intersections in Southern California with an average daily traffic (ADT) volume of approximately 100,000 vehicles per day. As the CO hotspots were not experienced at the Wilshire Boulevard/Veteran Avenue intersection, it can be reasonably inferred that CO hotspots would not be experienced at any intersections within the vicinity of the project site due to the low volume of traffic (193 new daily trips) that would occur as a result of project implementation. Therefore, impacts would be less than significant.

Toxic Air Contaminants

The proposed project would include a wet laboratory that would involve the use of chemicals and may include Toxic Air Contaminants (TACs). Laboratory operations that use TACs would be performed in fume hoods to protect people in the laboratory from exposure to hazardous vapors. TAC emissions are first diluted in the fume hood, then the fume hood exhaust is emitted and disperses into the atmosphere. The dilution and dispersion from the fume hoods reduce pollutant concentrations and exposure. Adverse effects associated with pollutant exposure also decrease with distance.

Sensitive receptors located near the proposed project include residents located approximately 575 feet southeast of the project site. The Physical Sciences Classroom Building and Lecture Hall are located approximately 50 feet north of the project site; however these buildings do not have outdoor areas of frequent human use where sensitive receptors could be exposed to TACs through inhalation for extended periods of time.

A quantitative Health Risk Assessment (HRA) was prepared as part of the 2007 LRDP EIR. The HRA estimated TAC emissions from laboratory operations, fuel combustion, and vehicular emissions based on existing emissions inventories and projected campus-wide growth. Air dispersion modeling and risk characterization was conducted to calculate both average and high-end risks for each receptor based on the predicted downwind concentration of TACs, the toxicity of each TAC, and the exposure scenario (residential, occupational, schoolchildren, etc.). Incremental cancer risks (i.e., cancer risks above background levels) and non-cancer hazards were calculated for over 2,600 receptors in the UCI campus vicinity.

Two types of health effects were evaluated in this HRA: cancer risk, which represents the potential for increased risk of cancer in a lifetime associated with exposure to emissions from the implementation of the UCI LRDP, and non-cancer hazards (both chronic and acute) which represent the potential for a non-cancer health effect due to exposure on either a chronic or short-term basis to emissions from the LRDP.

The HRA found incremental cancer risks to be below the SCAQMD significance level of 10 in one million for all receptors and all exposure scenarios. The population cancer burden, based on diesel particulate (the risk driving TAC) was calculated to be 0.0003612, which is well below the SCAQMD's acceptable cancer burden of 0.5. The emissions associated with implementation of the UCI LRDP was therefore found not to pose a significant incremental cancer risk to the surrounding populations. Additionally, the LRDP EIR analysis determined that chronic non-cancer hazards and acute hazards would be below the significance threshold of 1.0 for all receptors. The emissions associated with implementation of the UCI LRDP would therefore not pose a chronic or acute hazard to the surrounding populations.

The HRA within the LRDP EIR analyzed a 140 percent increase in building square footage (the analysis used a baseline of 3,103,000 gross square feet of existing engineering and science building space) at UCI and assumed a comparable increase in percentage of chemical uses would occur. Since completion of the HRA and the LRDP, the campus has added 404,961 gross square feet of engineering and science building space. The HRA analyzed a total of 7,440,000 gross square feet of engineering and science buildings for the LRDP. The post-LRDP space increase is about 5 percent of the total analyzed. Therefore, the proposed ISB would still be within the building square footage assumed in the HRA and would not result in additional impacts beyond what was originally identified in the LRDP EIR.

The HRA included a refined dispersion modeling assessment to estimate project-related pollutant concentrations from on-campus sources. Air dispersion modeling is dependent on the emissions of TACs, the location of sources, and the site-specific meteorology of the impacted area. The dispersion modeling calculated one-hour and annual downwind concentrations to provide an estimate of the amount of TACs to which receptors would be exposed due to operations on the UCI campus. Evaluated land uses in the surrounding area include residential and commercial areas in the immediate vicinity of UCI, student housing on campus, and faculty housing on campus. A receptor grid was set up in the on-campus housing areas to address on-site impacts. In addition, a 100-meter grid was set up to evaluate off-site risks. As noted above, incremental cancer risks (i.e., cancer risks above background levels) and non-cancer hazards were calculated for over 2,600 receptors in the UCI campus vicinity.

The HRA identified the point of maximum impact, the maximally impacted residential receptor, and the maximally impacted occupational receptor. Separate exposure scenarios were evaluated for both on- and off-site residential, occupational, student, and child receptors. The HRA determined that emissions associated with implementation of the UCI LRDP would not pose a significant incremental cancer risk to the surrounding populations. Chronic and acute non-cancer hazards were also found to be less than significant.

The HRA was designed to present an upper-bound calculation of risks to individual receptors on and in the vicinity of the UCI campus. Uncertainties in the emission estimates, dispersion modeling, exposure assessment, and toxicity assessment are designed to provide health-protective estimates of human health risks. Actual risks are likely to be lower than the upper-bound risks presented in the HRA. The findings of the HRA uncertainty evaluation add confidence to the conclusions that the potential incremental cancer risks as well as chronic and acute non-cancer hazards will not exceed significance thresholds.

It should be noted that since completion of the HRA, the California Office of Environmental Health Hazard Assessment (OEHHA) has updated their guidance for health risk assessments to include age sensitivity factors, updated breathing rates, a factor for the fraction of time spent at home, and reduced exposure periods. Methods used in the HRA are conservative in that the methodology is more likely to overestimate than underestimate potential human health impacts. For example, exposed individuals are assumed to live or work at locations where TAC concentrations are predicted to be highest, and are also assumed to be present at these locations for 24 hours per day, 7 days per week, for 70 years (residential exposure), and for 8 hours per day, 5 days per week, for 46 years (occupational exposure). Employing these assumptions results in conservative estimates of the amount of TACs these individuals might inhale, and in conservative estimates of the potential individual health risks. The OEHHA updated breathing rates would represent an increase in risk values. However, the fraction of time at home factor and the reduced exposure period would represent a decrease in the risk values. As such, the updated OEHHA guidance does not invalidate the conservative values in the HRA, and the potential incremental cancer risks as well as chronic and acute non-cancer hazards will not exceed significance thresholds.

The proposed project would also be required to comply with various State and University regulations to ensure that impacts associated with the laboratory would not occur. Laboratory fume hoods operated on the UCI campus are required to comply with Title 8 of the California Code of Regulations, which contains California Occupational Safety and Health Administration (OSHA) requirements for these emission sources. The regulations are concerned with worker health and safety, requiring a minimum flow of speed, face velocity, and certain design features to protect laboratory personnel in their work. In addition, the code establishes specific requirements for the use and storage of carcinogens, including a requirement to scrub or filter air emissions from areas where carcinogens are used. Furthermore, a wind dispersion analysis will be completed as part of the final project design. Other than the requirement that the top of the fume hood stack must be located at least 7 feet above the roof, the regulations do not address emissions once the exhausted air mixes with outdoor air. Additionally, UCI Environmental Health & Safety and Risk Services provides an air quality program that assists the campus in air pollution prevention and provides compliance assistance on SCAQMD and other Clean Air Act laws and regulations. Therefore, TAC impacts associated with the proposed project would be less than significant.

e) Objectionable Odors: Less than Significant Impact

According to the SCAQMD CEQA Air Quality Handbook, land uses associated with odor complaints typically include agricultural uses, wastewater treatment plants, food processing plants, chemical plants, composting, refineries, landfills, dairies, and fiberglass molding. The proposed project does not include any uses identified by the SCAQMD as being associated with odors.

Construction activities associated with the project may generate detectable odors from heavy-duty equipment exhaust. Construction-related odors would be short-term in nature, dissipate rapidly, and cease upon project completion. Any impacts to existing adjacent land uses would be short-term. Therefore, impacts due to objectionable odors would be less than significant. No mitigation is required.

Mitigation Measures

AQ-1: Prior to initiating construction, UCI shall ensure that the project construction contract includes a construction emissions mitigation plan, including measures compliant with SCAQMD Rule 403 (Fugitive Dust), to be implemented and supervised by the on-site construction supervisor, which shall include, but not be limited to, the following BMPs:

- During grading and site preparation activities, exposed soil areas shall be stabilized via frequent watering, non-toxic chemical stabilization, or equivalent measures at a rate to be determined by the on-site construction supervisor.

- During windy days when fugitive dust can be observed leaving the construction site, additional applications of water shall be required at a rate to be determined by the onsite construction supervisor.

- Disturbed areas designated for landscaping shall be prepared as soon as possible after completion of construction activities.

- Areas of the construction site that will remain inactive for three months or longer following clearing, grubbing and/or grading shall receive appropriate BMP treatments (e.g., revegetation, mulching, covering with tarps, etc.) to prevent fugitive dust generation.

- All exposed soil or material stockpiles that will not be used within 3 days shall be enclosed, covered, or watered twice daily, or shall be stabilized with approved nontoxic chemical soil binders at a rate to be determined by the on-site construction supervisor.

- Unpaved access roads shall be stabilized via frequent watering, non-toxic chemical stabilization, temporary paving, or equivalent measures at a rate to be determined by the on-site construction supervisor.

- Trucks transporting materials to and from the site shall allow for at least two feet of freeboard (i.e., minimum vertical distance between the top of the load and the top of the trailer). Alternatively, trucks transporting materials shall be covered.

- Speed limit signs at 15 mph or less shall be installed on all unpaved roads within construction sites.

- Where visible soil material is tracked onto adjacent public paved roads, the paved roads shall be swept and debris shall be returned to the construction site or transported off site for disposal.

- Wheel washers, dirt knock-off grates/mats, or equivalent measures shall be installed within the construction site where vehicles exit unpaved roads onto paved roads.

- Diesel powered construction equipment shall be maintained in accordance with manufacturer's requirements, and shall be retrofitted with diesel particulate filters where available and practicable.

- Heavy duty diesel trucks and gasoline powered equipment shall be turned off if idling is anticipated to last for more than 5 minutes.

- Where feasible, the construction contractor shall use alternatively fueled construction equipment, such as electric or natural gas-powered equipment or biofuel.

- Heavy construction equipment shall use low NOx diesel fuel to the extent that it is readily available at the time of construction.

- To the extent feasible, construction activities shall rely on the campus's existing electricity infrastructure rather than electrical generators powered by internal combustion engines.

- The construction contractor shall develop a construction traffic management plan that includes the following:

    - Scheduling heavy-duty truck deliveries to avoid peak traffic periods Consolidating truck deliveries.

- Where possible, the construction contractor shall provide a lunch shuttle or on-site lunch service for construction workers.

- The construction contractor shall, to the extent possible, use pre-coated architectural materials that do not require painting. Water-based or low VOC coatings shall be used that are compliant with SCAQMD Rule 1113. Spray equipment with high transfer efficiency, such as the high volume-low pressure spray method, or manual coatings application shall be used to reduce VOC emissions to the extent possible.

- Project constructions plans and specifications will include a requirement to define and implement a work program that would limit the emissions of reactive organic gases (ROG's) during the application of architectural coatings to the extent necessary to keep total daily ROG's for each project to below 75 pounds per day, or the current SCAQMD threshold, throughout that period of construction activity to the extent feasible. The specific program may include any combination of restrictions on the types of paints and coatings, application methods, and the amount of surface area coated as determined by the contractor.

- The construction contractor shall maintain signage along the construction perimeter with the name and telephone number of the individual in charge of implementing the construction emissions mitigation plan, and with the telephone number of the SCAQMD's complaint line. The contractor's representative shall maintain a log of any public complaints and corrective actions taken to resolve complaints.

4.3 Biological Resources

Issues	Potentially Significant Impact	Project Impact Adequately Addressed in LRDP EIR	Less Than Significant with Project-level Mitigation Incorporated	Less Than Significant Impact	No Impact
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 CA Department of Fish and Wildlife or U.S. Fish and Wildlife Service?			X		
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Wildlife or US Fish and Wildlife Service?					X
c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?					X

Issues	Potentially Significant Impact	Project Impact Adequately Addressed in LRDP EIR	Less Than Significant with Project-level Mitigation Incorporated	Less Than Significant Impact	No Impact
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?					X
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?					X
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other applicable habitat conservation plan?					X

Discussion

Biological resources issues are discussed in Section 4.3 of the 2007 LRDP EIR.

a) Sensitive Species: Less than Significant Impact with Project-level Mitigation Incorporated

The proposed project is infill development that would be located on an existing surface parking lot located within the UCI Academic Core, and is surrounded by adjacent development in an urbanized setting. No sensitive species or optimal habitat for such species occur on-site. Existing on-site ornamental vegetation, where birds protected under the Migratory Bird Treaty Act (MBTA) may occur during the nesting season, would be removed during demolition and grading. Construction is anticipated to begin during the 2018 nesting season and could potentially impact any bird species located in on-site or adjacent vegetation. Therefore, compliance with project-specific mitigation measure BR-1, which would require bird surveying

30 days prior to construction, would reduce potential impacts to sensitive species to a less than significant level.

b) Riparian Habitat: No Impact

c) Wetlands: No Impact

The project site has been previously developed and is located in the built-out and urbanized Academic Core of the campus. Furthermore, biological surveys conducted for the 2007 LRDP EIR concluded that no riparian or wetland habitat exists on the project site (page 4.3-9). Therefore, the proposed project would not affect riparian or wetland habitats and no impact would occur. No mitigation is required.

d) Wildlife Corridors: No Impact

The 2007 LRDP EIR determined that the campus is bordered by mixed use, residential, and roadways with limited wildlife movement corridors in the vicinity. The project site itself is urbanized and located over 0.5 miles from drainage culverts that were placed under the State Route 73 (SR-73) Toll Road to support movement between the Bonita Canyon wetland areas, San Joaquin Hills, and Natural Community Conservation Plan Reserve System lands on the campus (LRDP EIR, page 4.3-47). As discussed in Section 2.0, Project Description, the project site is located in an urbanized area of the campus, which is not conducive to wildlife movement. Therefore, the proposed project would not interfere with wildlife corridors and no impact would occur. No mitigation is required.

e) Conflict with Applicable Policies: No Impact

The proposed project is located in the built-out and urbanized Academic Core and there are no applicable policies protecting biological resources. Therefore, the proposed project would not conflict with local policies protecting biological resources and no impact would occur. No mitigation is required.

f) Conflict with a Natural Community Conservation Plan or Habitat Conservation Plan: No Impact

The project site is not located within a Habitat Conservation Plan, Natural Community Conservation Plan, or any other habitat conservation plan. Therefore, no impacts would occur. No mitigation is required.

Mitigation Measures

BR-1: In order to avoid impacts to nesting birds, project activities shall occur outside of the peak avian breeding season, which runs from February 1st through August 31st. If project construction is necessary during the bird breeding season, a qualified biologist with experience in conducting bird breeding surveys shall conduct surveys for nesting birds, within three days prior to the work in the area, and ensure no nesting birds in the project area would be impacted by the project. If an active nest is identified, a buffer shall be established between the construction activities and the nest so that nesting activities are not interrupted. The buffer shall be a minimum width of 300 feet (500 feet for raptors), be delineated by temporary fencing, and remain in effect as long as construction is occurring or until the nest is no longer active. Reductions in the nest buffer distance may be appropriate depending on the avian species involved, ambient levels of human activity, screening vegetation, or other possible factors.

4.4 Cultural Resources

Issues	Potentially Significant Impact	Project Impact Adequately Addressed in LRDP EIR	Less Than Significant with Project-level Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:					
a) Cause a substantial adverse change in the significance of a historical resource as defined in Section 15064.5?					X
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5?		X			
c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?		X			
d) Disturb any human remains, including those interred outside of formal cemeteries?				X	
e) Cause a substantial adverse change in the significance of a tribal cultural resource as defined in Public Resources Code 21074?				X	

Discussion

Cultural resources issues are discussed in Section 4.4 of the 2007 LRDP EIR.

a) Historical Resources: No Impact

Existing on-site use is surface parking, Lot 12B, which based on use, would not be considered an historical resource. Furthermore, as shown in the LRDP EIR Table 4.4-2, none of the potential historical resources listed exist on the project site (page 4.4-15). Therefore, the proposed project would not change an historical resource and no impact occur. No mitigation is required.

b) Archaeological Resources: Project Impact Adequately Addressed in EIR

Recorded archaeological resources located within the UCI campus are summarized in Table 4.4-1 of the 2007 LRDP EIR. No archaeological sites have been discovered and recorded in the Academic Core, including on or adjacent to the project site. Data and artifacts from both have been recovered and no further archaeological testing is required. To date, with grading that has previously occurred on the project site, there has been no evidence of any archaeological resources within the project boundaries. There is some possibility, however, that unknown archaeological remains could occur beneath the ground surface (LRDP EIR, page 4.4-4). Earth moving activities could possibly uncover previously undetected archaeological remains associated with prehistoric cultures, and a loss of a significant archaeological resource could result if such materials are not properly identified. Therefore, monitoring during grading by a qualified archaeologist through implementation of LRDP EIR mitigation measure Cul-1C would reduce impacts to archaeological resources to a less than significant level.

c) Paleontological Resources: Project Impact Adequately Addressed in EIR

Paleontological investigations conducted for the 1989 LRDP determined that the Topanga Formation geologic units under the campus are considered to be of high paleontological sensitivity for vertebrate and invertebrate fossils. The assessment noted that one of the most unique features on the campus is the micro-paleontological material found along Bonita Canyon Drive, consisting of microscopic fossils of single-celled animals that inhabited the sea floor. The fossils contained in these exposures are of regional and interregional significance because they provide the basis for comparisons between the depositional histories of various parts of the Los Angeles Basin (LRDP EIR, page 4.4-19). Given the geological setting and recognized high sensitivity for vertebrate and invertebrate fossils on the campus, excavation operations, such as trenching and/or tunneling that cut into geologic formations, might expose fossil remains. According to the 2007 LRDP EIR, any project involving excavation into either the Topanga Formation or the terrace deposits could have an adverse effect on paleontological resources. Therefore, implementation of LRDP EIR mitigation measures Cul-4A, Cul-4B, and Cul-4C, which requires monitoring during grading and proper recovery if fossils are found, would reduce impacts to paleontological resources to a less than significant level (LRDP EIR, page 4.4-20).

d) Human Remains: Less than Significant Impact

Human remains may be uncovered during earth moving activities associated with construction of the project. In the event that human remains are discovered during construction, UCI would comply with Section 7050.5 of the California Health and Safety Code and Public Resources Code 5097.98, which requires notification of the County Coroner to determine whether the remains are of forensic interest. If the Coroner, with the aid of a supervising archeologist, determines that the remains appear to be Native American, s/he would contact the Native American Heritage Commission (NAHC) within 24 hours, who would in turn, notify the person they identify as the most likely descendent (MLD) of the human remains. Further actions would be determined by the MLD who has 48 hours after notification of the NAHC to make recommendations regarding the disposition of the remains. Therefore, compliance with the California Health and Safety Code and Public Resources Code would reduce potential impacts to human remains to a less than significant level. No mitigation is required.

e) Tribal Cultural Resources: Less than Significant Impact

In accordance with AB 52, notification letters were mailed to the Gabrieleño Band of Mission Indians – Kizh Nation and Juaneño Band of Mission Indians – Acjachemen Nation on June 30, 2017. UCI received a letter from the Gabrieleño Band of Mission Indians requesting that an affiliated Native American monitor be on-site during ground disturbance activities. As with all projects since the implementation of AB 52, UCI has agreed with the Gabrieleño Band of Mission Indians' request and would have a Native American monitor on-site working alongside the archeological/paleontological monitor during earthmoving activities for the project. UCI will continue to work closely with the Gabrieleño Band of Mission Indians on both this project and on future projects.

As discussed in 4.4(b) above, there is no evidence of archaeological resources within or adjacent to the project site, which has been previously disturbed. For these reasons, UCI does not anticipate encountering tribal resources during construction of the project. However, with the implementation of LRDP EIR mitigation measure Cul-1C (hiring a qualified archaeologist to monitor ground-disturbing activities and to ensure the protection of any resources that may be discovered) and compliance with AB 52, impacts to tribal cultural resources would be reduced to a less than significant level. No mitigation is required.

Mitigation Measures

Cul-1C: Prior to land clearing, grading, or similar land development activities for future projects that implement the 2007 LRDP in areas of identified archaeological sensitivity, UCI shall retain a qualified archaeologist (and, if necessary, a culturally affiliated Native American) to monitor these activities. In the event of an unexpected archaeological discovery during grading, the on-site construction supervisor shall redirect work away from the location of the archaeological find. A qualified archaeologist shall oversee the evaluation and recovery of archaeological resources, in accordance with the procedures listed below, after which the on-site construction supervisor shall be notified and shall direct work to continue in the location of the archaeological find. A record of monitoring activity shall be submitted to UCI each month and at the end of monitoring. If an archaeological discovery is determined to be significant, the archaeologist shall prepare and implement a data recovery plan. The plan shall include, but not be limited to, the following measures:

a. Perform appropriate technical analyses;

b. File an resulting reports with South Coast Information Center; and

c. Provide the recovered materials to an appropriate repository for curation, in consultation with a culturally-affiliated Native American.

Cul-4A: Prior to grading or excavation for future projects that implement the 2007 LRDP and would excavate sedimentary rock material other than topsoil, UCI shall retain a qualified paleontologist to monitor these activities. In the event fossils are discovered during grading, the on-site construction supervisor shall be notified and shall redirect work away from the location of the discovery. The recommendations of the paleontologist shall be implemented with respect to the evaluation and recovery of fossils, in accordance with mitigation measures Cul-4B and Cul-4C, after which the on-site construction supervisor shall be notified and shall direct work to continue in the location of the fossil discovery. A record of monitoring activity shall be submitted to UCI each month and at the end of monitoring.

Cul-4B: If the fossils are determined to be significant, then mitigation measure Cul-4C shall be implemented.

Cul-4C: For significant fossils as determined by mitigation measure Cul-4B, the paleontologist shall prepare and implement a data recovery plan. The plan shall include, but not be limited to, the following measures:

a. The paleontologist shall ensure that all significant fossils collected are cleaned, identified, catalogued, and permanently curated with an appropriate institution with a research interest in the materials (which may include UCI);

b. The paleontologist shall ensure that specialty studies are completed, as appropriate, for any significant fossil collected; and

c. The paleontologist shall ensure that curation of fossils are completed in consultation with UCI. A letter of acceptance from the curation institution shall be submitted to UCI.

4.5 Geology and Soils

Issues	Potentially Significant Impact	Project Impact Adequately Addressed in LRDP EIR	Less Than Significant with Project-level Mitigation Incorporated	Less Than Significant Impact	No Impact
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.				X	
ii) Strong seismic ground shaking?				X	
iii) Seismic-related ground failure, including liquefaction?				X	
iv) Landslides				X	
b) Result in substantial soil erosion or the loss of topsoil?				X	

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

Discussion

Geology and soils issues are discussed in Section 4.5 of the 2007 LRDP EIR.

a) Expose People or Structures to:

i) Fault Rupture: Less than Significant Impact

No active or potentially active earthquake faults have been identified on the UCI campus through the State Alquist-Priolo Earthquake Fault Zoning Act program, but a locally mapped fault trace, known as the “UCI Campus Fault,” traverses the campus. A Restricted Use Zone (RUZ) extending 50 feet beyond both sides of this fault has been established to prevent the construction of new development on the fault in case of rupture (LRDP EIR, pages 4.5-8 through 9). The RUZ does not extend onto the project site, which is located approximately one-quarter mile southwest of the fault. Grading, foundation, and building structure elements would be designed to meet or exceed the California Building Code (CBC) seismic safety standards and comply with the UC Seismic Safety Policy. Therefore, due to location and compliance with the CBC, impacts due to fault rupture would be less than significant.

ii) Seismic Ground Shaking: Less than Significant Impact

The entire campus, like most of southern California, is located in a seismically active area where strong ground shaking could occur during movements along any one of several faults in the region. An earthquake of magnitude 7.5 on the Richter scale could occur along the Newport-Inglewood Fault, the nearest major fault located approximately 4.5 miles southwest of the campus. Earthquakes along the San Andreas Fault, about 35 miles northeast of the campus could generate an 8.0 magnitude level of energy, and movement along the San Jacinto Fault, about 30 miles away, could release ground motion energy estimated at 7.5 on the Richter scale (LRDP EIR, page 4.5-2).

An earthquake along any number of local or regional faults could generate strong ground motions at the subject site that could dislodge objects from walls, ceilings, and shelves or even damage and destroy buildings and other structures, and people within the proposed project could be exposed to these hazards. However, grading, foundation, and building structure elements would be designed to meet or exceed the CBC seismic safety standards. In addition, the University has adopted a number of programs and procedures to reduce the hazards from seismic shaking, including compliance with the UC Seismic Safety Policy. Therefore, compliance with the CBC, UC Seismic Safety Policy, and implementation of recommendations in the site-specific geotechnical study conducted during the design phase would reduce any potential hazards associated with seismic ground shaking to a less than significant level. No mitigation is required.

iii) Liquefaction: Less than Significant Impact

The 2007 LRDP EIR indicates that a majority of soils on the UCI campus are characterized as terraced deposits. It is unlikely that these soils would be subject to liquefaction due to the denseness of the material and depth to groundwater. Therefore, compliance with the CBC, UC Seismic Safety Policy, and implementation of recommendations in the site-specific geotechnical investigation conducted during the design phase would reduce any potential hazards associated with liquefaction or landslides to a less than significant level. No mitigation is required.

iv) Landslide: Less than Significant Impact

Landslides may occur due to earthquakes, which is due to generally weak soil and rock on sloping terrain. The project site, which has been graded previously, is located on relatively flat terrace. Furthermore, the project site is not located in an area considered to be susceptible to landslides according to the California Geological Survey. Therefore, impacts due to landslides would be less than significant. No mitigation is required.

b) Soil Erosion: Less than Significant Impact

As noted in the LRDP EIR, earth-disturbing activities associated with project construction that may result in soil erosion would be temporary. The project would comply with the CBC, which regulates excavation and grading activities, and the National Pollutant Discharge Elimination System (NPDES) general permit for construction activities, which requires preparation of an erosion control plan and implementation of construction best management practices (BMPs) to prevent soil erosion. Such BMPs could include, but not limited to, silt fences, watering for dust control, straw-bale check dams, and hydroseeding. The LRDP EIR concluded that with implementation of these routine control measures potential construction-related erosion impacts would be less than significant (LRDP EIR, page 4.5-10). Soil erosion is not anticipated to occur because the project site is currently a paved surface parking lot, and construction of the structure would not increase the impermeable surfaces from the existing state. However, as discussed in Section 4.8, Hydrology and Water Quality, in the event that storm water runoff were to increase, velocities would be reduced to preexisting conditions to the extent feasible (MM Hyd-1A). Therefore, impacts due to soil erosion would be less than significant. No mitigation is required.

c) Soil Instability: Less than Significant Impact

If loose or compressible soil materials occur on site, they may be subject to settlement under increased loads. Soil instability may also occur due to an increase in moisture content from site irrigation or changes in drainage conditions. Typical measures to treat such unstable materials involve removal and replacement with properly compacted fill, compaction grouting, or deep dynamic compaction. A site-specific geotechnical investigation would be conducted during the design phase and any recommendations would be implemented in accordance with the CBC. Therefore, potential impacts associated with unstable materials would be reduced to a less than significant level. No mitigation is required.

d) Expansive Soils: Less than Significant Impact

Expansive topsoils are prevalent on campus and are generally a dark brown sandy clay, clayey sand, or lean clay, which can be detrimental to foundations, concrete slabs, flatwork, and pavement. Topsoil throughout the campus is highly expansive, ranging from eight to 12 percent swell with an underlying material generally consisting of non-expansive to moderately expansive terrace deposits with a swell ranging from zero to eight percent.

The CBC includes provisions for construction on expansive soils. Proper fill selection, moisture control, and compaction during construction can prevent these soils from causing significant damage. Expansive soils can be treated by removal (typically the upper three feet below finish grade) and replacement with low expansive soils, lime-treatment, and/or moisture conditioning. The geotechnical investigations and soils testing to be conducted as part of the routine final design process would determine the extent of any expansive or compressible soils that occur on the site. Therefore, adherence to the CBC and implementation of the recommendations in the project-specific geotechnical investigation conducted during the design phase would reduce impacts due to expansive soils to a less than significant level. No mitigation is required.

e) Septic Tanks or Alternative Waste Disposal Systems: No Impact

All wastewater generated by the proposed project would be conveyed via local sewers directly into the existing public sanitary sewer system maintained by the Irvine Ranch Water District (IRWD). Therefore, the proposed project would not provide a sanitary waste disposal system and no impact would occur. No mitigation is required.

Mitigation Measures

No mitigation measures are required.

4.6 Greenhouse Gas Emissions

Issues	Potentially Significant Impact	Project Impact Adequately Addressed in LRDP EIR	Less Than Significant with Project-level Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:					
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?				X	
b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?					X

Discussion

Greenhouse gas (GHG) issues are discussed in Section 5.0 of the 2007 LRDP EIR. A project-specific Greenhouse Gas Assessment was prepared by Michael Baker International, Inc. and is included as Appendix B.

a) Greenhouse Gas Emissions: Less than Significant Impact

The proposed project would result in direct and indirect emissions of CO_2, N_2O, and CH_4, and would not result in other GHGs that would facilitate a meaningful analysis. Therefore, this analysis focuses on these three forms of GHG emissions. Direct project-related GHG emissions include emissions from construction activities, area sources, and mobile sources, while indirect sources include emissions from electricity consumption, water demand, and solid waste generation. Operational GHG estimations are based on energy emissions from natural gas usage and automobile emissions. Project GHG emissions were calculated using the California Emissions Estimator Model (CalEEMod) version 2016.3.1, which relies on trip generation data, and specific land use information to calculate emissions. Stantec Consulting Services estimated during the initial analysis that the proposed project would result in approximately 193 new daily trips, and is the number of trips used to calculate direct emissions for this GHG analysis. Since the initial traffic analysis, the number of anticipated daily trips was reduced from 193 to 113 (see Section 4.14, Transportation and Traffic), which would result in slightly lower GHG emissions than estimated in the calculations below. Table 4.6-1, Greenhouse Gas Emissions, presents the estimated CO_2, N_2O, and CH_4 emissions of the proposed project with GHG-reducing design features and mitigation measures. As shown in Table 4.6-1, GHG emissions resulting from both construction and operation of the proposed project would result in approximately 1,216.52 $MTCO_2eq/yr$.

Table 4.6-1
Greenhouse Gas Emissions

Source	CO_2	CH_4		N_2O		Total Metric Tons of CO_2eq
	Metric Tons/yr[1]	Metric Tons/yr[1]	Metric Tons of CO_2eq[2]	Metric Tons/yr[1]	Metric Tons of CO_2eq[2]	
Direct Emissions						
• Construction (total of 481.42 $MTCO_2eq$ amortized over 30 years)	0.08	0.00	0.05	0.00	0.00	16.05
• Area Source	0.00	0.00	0.00	0.00	0.00	0.01
• Mobile Source	199.82	0.01	0.22	0.00	0.00	200.03
Total Direct Emissions	**199.9**	**0.01**	**0.27**	**0.00**	**0.00**	**216.09**
Indirect Emissions						
• Energy	973.45	0.04	0.92	0.01	2.96	977.32
• Water Demand	4.28	0.01	0.35	0.00	0.11	4.75
• Solid Waste Generation	7.41	0.44	10.95	0.00	0.00	18.36
Total Indirect Emissions[3]	**985.14**	**0.49**	**12.22**	**0.01**	**3.07**	**1,000.43**
Total Project-Related Emissions	***1,216.52 $MTCO_2eq/yr$***					
GHG Emissions Threshold	***3,000.00 $MTCO_2eq/yr$***[5]					
GHG Emissions Exceed Threshold?	***No***					

Direct Project-Related Sources of Greenhouse Gases

- Construction Emissions. Construction GHG emissions are typically summed and amortized over the lifetime of the project (assumed to be 30 years), then added to the operational emissions. As seen in Table 4.6-1, the proposed project would result in 481.42 $MTCO_2eq/yr$, which represents 16.05 $MTCO_2eq/yr$ when amortized over 30 years.

- Area Source. Area source emissions occur from hearths, architectural coatings, landscaping equipment, and consumer products. The project proposes a research and educational facility and would not include hearths. Area source GHG emissions would primarily occur from landscaping and consumer products and were calculated using CalEEMod and project-specific land use data. As noted in Table 4.6-1, the proposed project would result in 0.01 $MTCO_2eq$/year from area source GHG emissions.

- Mobile Source. The CalEEMod model relies upon trip generation data and project specific land use data to calculate mobile source emissions. The project would directly result in 200.03 $MTCO_2eq$/yr of mobile source-generated GHG emissions.

Indirect Project-Related Sources of Greenhouse Gases

- Energy Consumption. Energy consumption emissions were calculated using CalEEMod and project-specific land use data. Electricity would be provided to the project site through the UC Energy Services Unit via Southern California Edison (SCE) distribution and through on-campus generation. The project would indirectly result in 977.32 $MTCO_2eq$/year due to energy consumption.

- Water Demand. The project operations would result in a demand of approximately 1.01 million gallons of water per year. Emissions from indirect energy impacts due to water supply would result in 4.75 $MTCO_2eq$/year.

- Solid Waste. Solid waste associated with operations of the proposed project would result in 18.36 $MTCO_2eq$/year.

Project Design Features

It is noted that Table 4.6-1 includes reduced emissions from the project's design features in compliance with the Sustainable Practices Policy. Such features include the use of water conservation measures, such as low-flow faucets, showers, toilets, water-efficient landscaping and irrigation systems, and use of reclaimed water. In addition, the project would meet or exceed the Leadership in Energy and Environmental Design (LEED) Gold rating, utilize high-efficiency lighting, an Energy Efficient HVAC System/High Performance Fume Hoods, sustainable laboratories, chilled beams, photovoltaic panels and exceed Title 24 standards by 20 percent.

As depicted in Table 4.6-1, implementation of the proposed project would result in project-related GHG emissions of 1,216.52 $MTCO_2eq$/yr. Therefore, the project would not exceed the 3,000 $MTCO_2eq$/yr significance threshold and GHG impacts would be less than significant. No mitigation is required.

b) Conflict with a Greenhouse Gas Plan, Policy, or Regulation: No Impact

The UC Sustainable Practices Policy establishes goals and policies to reduce GHG emissions from various sources at the campus. Although construction of the proposed project would increase the amount of GHG emissions generated by the campus, as discussed in Section 2.0, Project Description, the project would incorporate various sustainable project design features (e.g., water conservation measures, meet or exceed LEED Silver rating, exceed Title 24 by 20 percent, use energy efficient lighting, utilize an energy efficient HVAC system/high performance fume hoods, contain sustainable laboratories, chilled beams, photovoltaic panels, compliance with Labs 21 and Cal Green, etc.) in compliance with the UC Sustainable Practices Policy. In order for the campus to reach the carbon neutrality goal of zero emissions of scope 1 and 2 sources by 2025 and scope 3 sources by 2050 as required by the Carbon Neutrality Initiative and the UC Sustainable Practices Policy, the campus has identified a tiered set of strategies. These strategies include low-carbon growth through green building programs, reducing existing emissions through deep energy efficiency, replacing fossil fuel-based energy by deploying of on-site renewable energy and procuring off-site renewable energy, and mitigating the remaining carbon emissions through offset programs. Furthermore, the proposed project would not impede the campus' ability to reduce emissions as it is an infill development project and would achieve a high attainment of energy efficiency in accordance with UC policy.

In addition, UCI adopted a Climate Action Plan (CAP) in 2007, and updated in 2016, in cooperation with AB 32, and has guided an array of climate action protection strategies and projects to reduce UCI GHG emissions. The purpose of this CAP is to identify UCI's long-term vision and commitment to reduce its GHG emissions in support of University of California Sustainability Practices Policy and campus sustainability goals. These commitments include reduction of GHG emissions to 1990 levels by the year 2020 (a reduction of approximately 49 percent from projected emissions), climate neutrality by the year 2025 (for on-site combustion of fossil fuels and purchased electricity), and climate neutrality by the year 2050 (for UCI commuters and University funded air travel). The CAP does not contain GHG thresholds. As discussed in 4.6(a) above, the project's GHG emissions would be below the 3,000 $MTCO_2eq$ per year threshold in compliance with AB 32. Therefore, the proposed project would not conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs and no impact would occur. No mitigation is required.

Mitigation Measures

No mitigation measures are required.

4.7 Hazards and Hazardous Materials

Issues	Potentially Significant Impact	Project Impact Adequately Addressed in LRDP EIR	Less Than Significant with Project-level Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:					
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?				X	
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?				X	
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?					X
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?					X

Issues	Potentially Significant Impact	Project Impact Adequately Addressed in LRDP EIR	Less Than Significant with Project-level 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?				**X**	
f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?					**X**
g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?		**X**			
h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?				**X**	

Discussion

Hazards and hazardous materials issues are discussed in Section 4.6 of the 2007 LRDP EIR.

a) Transport, Use, Disposal of Hazardous Materials: Less than Significant Impact

b) Release of Hazardous Materials: Less than Significant Impact

As discussed in the 2007 LRDP EIR, implementation would include development of facilities that use hazardous materials in teaching and research activities (page 4.6-25). Also, with an increase in on-campus facilities, expansion of maintenance and cleaning services would be required, which would increase the use, handling, storage, and disposal of products routinely used in building maintenance, some of which may contain hazardous materials. This, in turn, would result in an increase in the amount of hazardous materials that are used, stored, transported, and disposed and could increase the potential for an accident or accidental release of hazardous materials or wastes.

The proposed facilities would be similar to those already present on campus, specifically within the Physical Sciences Quad where the project site is located. These facilities include wet laboratories that use a variety of chemicals, compounds, and other materials that are considered hazardous. Hazardous material types that may be used as part of the proposed project include, but are not limited to, oxidizers, oxidizing gas, flammable solid, flammable gas, inert gas, unstable reactive, water reactive, toxic/highly toxic, pyrophoric, organic peroxide, combustible liquid, cryogenics, chemicals, and corrosives, as well as commercial cleaning products and landscape maintenance chemicals.

However, the type, form, and concentrations of potentially hazardous materials proposed for use during operation and maintenance at the proposed project and how these would be transported, used, and stored, would be consistent with existing practices by UCI's Office of Environmental Health and Safety. Additionally, a Hazardous Materials Technical Report, estimating anticipated chemical quantities that can be stored and used, would be prepared and submitted to the Fire Marshal for review per Section 414.1.3 of the CBC, upon submission for plan check. A Final Hazardous Materials Technical Report is required prior to occupancy to reflect the requirements of known occupants.

As discussed in the 2007 LRDP EIR, transportation of hazardous materials and wastes along any City or State roadway or rail lines within or near the campus is subject to all relevant Department of Transportation (DOT), California Highway Patrol (CHP), and California Department of Health Services (DHS) hazardous materials and wastes transportation regulations, as applicable. Regular inspections of licensed waste transporters are conducted by a number of agencies to ensure compliance with requirements that range from the design of vehicles used to transport wastes to the procedures to be followed in case of spills or leaks during transit.

Temporary, short-term related hazards for the project project would include transport, storage, use, and disposal of asphalt, fuels, solvents, paints, thinners, acids, curing compounds, grease, oil, fertilizers, coating materials, and other hazardous substances used during construction. The contractor ensures responsibility, as part of the contract, that hazardous materials and waste are handled, stored, and disposed of in accordance with all applicable federal, State, and local laws and regulations and routine construction control measures (LRDP EIR, page 4.6-7). Therefore, compliance with federal, State, and local regulation would reduce potential impacts from the release of hazardous materials to a less than significant level. No mitigation is required.

c) Proximity to Schools: No Impact

There are no schools located within one-quarter mile of the project site. Therefore, the proposed project would not emit large hazardous emissions in proximity to a school and no impact would occur. No mitigation is required.

d) Hazardous Materials Sites: No Impact

The 2007 LRDP EIR concluded that there are no recorded hazardous sites on or within the immediate vicinity of the project site, and according to the UCI Office of Environmental Health and Safety, no other known hazardous materials sites exist on-site (LRDP EIR, page 4.6-32). The project site is not included in any database of sites compiled pursuant to Section 65962.5 of the California Government Code, referred to as the Cortese List, and collected by the California Environmental Protection Agency (CalEPA 2016a). Specifically, the project site is not identified on (1) the California Department of Toxic Substances Control's (DTSC's) Hazardous Waste and Substances Site List, also called Envirostor; (2) DTSC's list of hazardous waste facilities where the DTSC has taken or contracted for corrective action because a facility owner/operator has failed to comply with a date for taking corrective action or because DTSC determined that immediate corrective action was necessary to abate an imminent or substantial endangerment; (3) State Water Resources Control Board's (SWRCB) Leaking Underground Storage Tank (LUST) sites, also called GeoTracker; (4) the SWRCB's list of Cease and Desist Orders (CDO) and Cleanup and Abatement Orders (CAO); and (5) the SWRCB's list of solid waste disposal sites with waste constituents above hazardous waste levels outside the waste management unit. Therefore, no impact due to hazardous materials sites would occur. No mitigation is required.

e) Airport Land Use Plan: Less than Significant Impact

The campus is located in the John Wayne Airport (JWA) planning area, which is located three miles northwest. The Airport Land Use Commission for Orange County has established Runway Protection Zones (RPZ) for JWA, also called Accident Potential Zones (APZ), which define the surrounding areas that are more likely to be affected if an aircraft-related accident were to occur. Those zones do not extend to the campus, including the project site, and because most aircraft accidents take place on or immediately adjacent to the runway it is unlikely that aircraft operating at JWA pose a safety threat to the campus. Additionally, as reported in the 2007 LRDP EIR, no accidents have occurred near the campus within the past 26 years (page 4.6-33). Therefore, impacts due to the proximity to an airport or private airstrip would be less than significant. No mitigation is required.

f) Private Airstrip: No Impact

No private airstrips are located within the vicinity of the campus. Therefore, because the proposed project is not located near a private airstrip, it would not affect public safety and no impact would occur. No mitigation is required.

g) Emergency Response: Project Impact Adequately Addressed in the LRDP EIR

In the event of a road closure, prior to the start of construction, the contractor would comply with LRDP EIR mitigation measure Haz-6A to ensure sufficient notification to the UCI Fire Marshal to allow coordination of emergency services that may be affected (LRDP EIR, page 4.6-34). Furthermore, the proposed project during both construction and operation would comply with UCI's Emergency Response Plan that addresses roles and responsibilities, communications, training, and procedures in order to respond to emergency situations. Therefore, with implementation of LRDP EIR mitigation measure Haz-6A, potential impacts to emergency response on or surrounding the campus would be reduced to a less than significant impact.

h) Wildland Fires: Less than Significant Impact

The proposed project site is located on a previously developed and urbanized area of the campus, including multi-story structures and paved parking lots, which are not conducive to wildland fires. The LRDP EIR indicated that areas prone to fire within the Academic Core are vegetation communities, such as coastal sage scrub and grassland (4.6-35), none of which exist on or adjacent to the project site. Therefore, impacts due to wildland fires would be less than significant. No mitigation is required.

Mitigation Measures

Haz-6A: Prior to initiating on-site construction for future projects that implement the 2007 LRDP and would involve a lane or roadway closure, the construction contractor and/or UCI Design and Construction Services shall notify the UCI Fire Marshal. If determined necessary by the UCI Fire Marshal, local emergency services shall be notified of the lane or roadway closure by the Fire Marshal.

4.8 Hydrology and Water Quality

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

Issues	Potentially Significant Impact	Project Impact Adequately Addressed in LRDP EIR	Less Than Significant with Project-level Mitigation Incorporated	Less Than Significant Impact	No Impact
runoff in a manner which would result in flooding on- or off-site?					
e) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?		**X**			
f) Otherwise substantially degrade water quality?				**X**	
g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?					**X**
h) Place within a 100-year flood hazard area structures which would impede or redirect flood flows?					**X**
i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?				**X**	
j) Inundation by seiche, tsunami, or mudflow?				**X**	

Discussion

Hydrology and water quality issues are discussed in Section 4.7 of the 2007 LRDP EIR.

a) *Water Quality Standards: Project Impact Adequately Addressed in LRDP EIR*

Applicable water quality standards developed by the State Water Resources Control Board (SWRCB) and Regional Water Quality Control Board (RWQCB) for storm water are complied with through required permits, including the General Construction Storm Water Permit, which would control pollutants contained in runoff generated from campus properties (LRDP EIR, page 4.17-19).

Potential water quality impacts during the construction would be stockpiled soils and materials stored outdoors on or adjacent to the project site during construction. Pollutants associated with these construction activities that could result in water quality impacts include soils, debris, other materials generated during site clearing and grading, fuels and other fluids associated with the equipment used for construction, paints and other hazardous materials, concrete slurries, and asphalt materials. These pollutants could impact water quality if washed, blown, or tracked off site to areas susceptible to wash off by storm water or non-storm water and could drain to one or more of the local receiving waters (LRDP EIR, page 4.7-21). Landscaping could also result in water quality impacts due to the use of fertilizers. If discharged, they could adversely affect aquatic plants and animals downstream in receiving waters through a reduction in oxygen levels and an increase in eutrophication. (LRDP EIR, page 4.7-21).

The proposed project would comply with the General Construction Storm Water Permit program, which would implement construction control measures to be specified in the project's Storm Water Pollution Prevention Plan (SWPPP) and install and maintain the post-construction best management practices (BMPs) to be specified in the project's Water Quality Management Plan (WQMP). Compliance with the permit would ensure that runoff from the developed site does not violate any water quality standards.

This project would not generate any point sources of wastewater or other liquid or solid water contaminants. All of the wastewater that would be generated would be discharged into a local sanitary sewer system that would convey the flows into Irvine Ranch Water District's (IRWD) regional wastewater collection and treatment system. Furthermore, potential impacts to San Diego Creek related to the project's post-construction activities would be reduced to below a level of significance with implementation of LRDP EIR mitigation measures Hyd-2A and Hyd-2B.

Therefore, in compliance with the storm water permits described above and implementation of LRDP EIR mitigation measures Hyd-2A and Hyd-2B, construction and post construction impacts would be reduced to a less than significant level.

b) *Groundwater: No Impact*

UCI does not use groundwater and instead is provided water by the Irvine Ranch Water District (IRWD). This issue was adequately addressed in the 2007 LRDP Initial Study and further analysis in the EIR was not required (LRDP EIR, page 4.7-27). Therefore, the proposed project would not affect groundwater tables and no impact would occur. No mitigation is required.

c) Erosion On or Off-site: Project Impact Adequately Addressed in LRDP EIR

For the project site, features that control run-off volumes and durations to minimize or eliminate erosion and siltation would be depicted on final construction plans. Any slopes would be landscaped and energy dissipaters and other control devices would be incorporated as needed. Drainage control measures would be implemented during rough grading to ensure that discharge volumes and durations are controlled on newly graded channels. Standard construction strategies such as desiltation basins, rip-rap, sandbag chevrons, straw waddles, etc. would be incorporated into the project's SWPPP both during and after grading. Therefore, potential erosion or siltation impacts during and following construction would be reduced to less than significant level through compliance with the conditions of the General Construction Storm Water Permit and LRDP EIR mitigation measures Hyd-2A and 2B. Therefore, impacts due to erosion would be reduced to a less than significant level.

d) Substantially Alter Drainage Pattern: Project Impact Adequately Addressed in LRDP EIR

Because the proposed project would not increase impervious surfaces on the project site, it is not anticipated runoff would significantly increase. However, in the event that runoff is altered, a storm drain system would be designed in accordance with the drainage criteria set forth in the LRDP mitigation measures Hyd-1A and Hyd-2B. The drainage system would be built to maintain or reduce peak runoff from 25-year and 100-year storm events. Additional hydrological analysis would be conducted as part of the final design process to specify all primary and secondary drainage control facilities required to satisfy flood control criteria, as well as site design, mechanical, structural, and non-structural measures to filter pollutants from site runoff, prior to discharge into the existing storm drain networks, if needed. Therefore, with implementation of Hyd-1A, impacts to the alteration of the drainage pattern would be reduced to a less than significant level.

e) Drainage System Capacity/Substantial Additional Polluted Runoff: Project Impact Adequately Addressed in LRDP EIR

Storm drainage would be collected and treated on site through BMPs, then conveyed to an existing 48-inch storm drain located northeast of the project site. As stated in 4.8(d) above, no increase to the perviousness of the project site would occur and the existing storm drain is anticipated to be sufficient. In the event additional drainage system capacity is deemed necessary during the hydrological analysis, the system would be designed to provide sufficient capacity to manage the level of water runoff anticipated upon completion of construction and a plan would be finalized during the design phase. Therefore, with implementation of Hyd-1A, impacts due to additional polluted runoff would be less than significant.

f) Substantially Degrade Water Quality: Less than Significant Impact

Refer to the previous responses to items 4.8(a) to 4.8(e). There are no other project elements that would affect the water quality of the site or its surroundings. Therefore, in compliance with the NPDES, impacts to water quality would be less than significant. No mitigation is required.

g) Place Housing with a 100-year Flood Hazard Area: No Impact

The campus, including the project site, is located in a FEMA Flood Zone X. This issue was adequately addressed in the 2007 LRDP Initial Study and further analysis in the EIR was not required (LRDP EIR, page 4.7-27). Therefore, the proposed project would not place housing within a 100-year flood hazard area no impact would occur. No mitigation is required.

h) Place Structures within a 100-year Flood Hazard Area: No Impact

Because there are no 100-year flood hazard areas on the campus, the proposed project would not place any structures in a manner that would impede or redirect flood flows. This issue was adequately addressed in the 2007 LRDP Initial Study and further analysis in the EIR was not required (LRDP EIR, page 4.7-27). Therefore, the proposed project would not place structures in a 100-year flood hazard area and no impact would occur. No mitigation is required.

i) Expose People or Structures to a Significant Risk Involving Flooding: Less than Significant Impact

Because the project site is not within a levee or dam inundation area, the proposed project would not expose people or structures to risk due to flooding. The LRDP EIR determined that it is unlikely that flooding because of dam or levee failure would have an effect on the campus due to its height above mean sea level (msl). This issue was adequately addressed in the 2007 LRDP Initial Study and further analysis in the EIR was not required (LRDP EIR, page 4.7-27). Therefore, impacts due to exposure of people or structures to flooding would be less than significant. No mitigation is required.

j) Seiche, Tsunami, or Mudflow: Less than Significant Impact

The campus is located approximately three miles from the Pacific Ocean where sufficient evacuation notice would be provided by the West Coast and Alaska Tsunami Warning Center in the occurrence of a tsunami. The site is not located in an area with potential for seiche and is relatively flat, which is not conducive for mudflows (LRDP EIR, pages 4.7-24 through 25). Therefore, impacts due to exposure of people or structures to seiche, tsunami, or mudflow would be less than significant. No mitigation is required.

Mitigation Measures

Hyd-1A: As early as possible in the planning process of future projects that implement the 2007

LRDP and would result in land disturbance of 1 acre or greater, and for all development projects occurring on the North Campus in the watershed of the San Joaquin Freshwater Marsh, a qualified engineer shall complete a drainage study. Design features and other recommendations from the drainage study shall be incorporated into project development plans and construction documents. Design features shall be consistent with UCI's Storm Water Management Program, shall be operational at the time of project occupancy, and shall be maintained by UCI. At a minimum, all drainage studies required by this mitigation measure shall include, but not be limited to, the following design features:

Site design that controls runoff discharge volumes and durations shall be utilized, where applicable and feasible, to maintain or reduce the peak runoff for the 10-year, 6-hour storm event in the post-development condition compared to the pre-development condition, or as defined by current water quality regulatory requirements.

Measures that control runoff discharge volumes and durations shall be utilized, where applicable and feasible, on manufactured slopes and newly-graded drainage channels, such as energy dissipaters, revegetation (e.g., hydroseeding and/or plantings), and slope/channel stabilizers.

Hyd-2A: Prior to initiating on-site construction for future projects that implement the 2007 LRDP, UCI shall approve an erosion control plan for project construction. The plan shall include, but not be limited to, the following applicable measures to protect downstream areas from sediment and other pollutants during site grading and construction:

- Proper storage, use, and disposal of construction materials.
- Removal of sediment from surface runoff before it leaves the site through the use of silt fences, gravel bags, fiber rolls or other similar measures around the site perimeter.
- Protection of storm drain inlets on-site or downstream of the construction site through the use of gravel bags, fiber rolls, filtration inserts, or other similar measures.
- Stabilization of cleared or graded slopes through the use of plastic sheeting, geotextile fabric, jute matting, tackifiers, hydro-mulching, revegetation (e.g., hydroseeding and/or plantings), or other similar measures.
- Protection or stabilization of stockpiled soils through the use of tarping, plastic sheeting, tackifiers, or other similar measures.
- Prevention of sediment tracked or otherwise transported onto adjacent roadways through use of gravel strips or wash facilities at exit areas (or equivalent measures).
- Removal of sediment tracked or otherwise transported onto adjacent roadways through periodic street sweeping.
- Maintenance of the above-listed sediment control, storm drain inlet protection, slope/stockpile stabilization measures.

Hyd-2B: Prior to project design approval for future projects that implement the 2007 LRDP and would result in land disturbance of 1 acre or more, the UCI shall ensure that the projects include the design features listed below, or their equivalent, in addition to those listed in mitigation measure Hyd-1A. Equivalent design features may be applied consistent with applicable MS4 permits (UCI's Storm Water Management Plan) at that time. All applicable design features shall be incorporated into project development plans and construction documents; shall be operational at the time of project occupancy; and shall be maintained by UCI.

- All new storm drain inlets and catch basins within the project site shall be marked with prohibitive language and/or graphical icons to discourage illegal dumping per UCI standards.
- Outdoor areas for storage of materials that may contribute pollutants to the storm water conveyance system shall be covered and protected by secondary containment.
- Permanent trash container areas shall be enclosed to prevent off-site transport of trash, or drainage from open trash container areas shall be directed to the sanitary sewer system.
- At least one treatment control is required for new parking areas or structures, or for any other new uses identified by UCI as having the potential to generate substantial pollutants. Treatment controls include, but are not limited to, detention basins, infiltration basins, wet ponds or wetlands, bio-swales, filtration devices/inserts at storm drain inlets, hydrodynamic separator systems, increased use of street sweepers, pervious pavement, native California plants and vegetation to minimize water usage, and climate controlled irrigation systems to minimize overflow. Treatment controls shall incorporate volumetric or flow-based design standards to mitigate (infiltrate, filter, or treat) storm water runoff, as appropriate.

4.9 Land Use and Planning

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

Discussion

Land use and planning issues are discussed in Section 4.8 of the 2007 LRDP EIR.

a) Divide an Established Community: No Impact

The proposed project would construct wet laboratory, office, classroom, auditorium, and support space in the Academic Core. Surrounding on-campus uses include the Physical Sciences Lecture Hall (PSLH) and Physical Sciences Classroom Building (PSCB) located north of the project site; Lot 12A, Physical Sciences High Bay, and Croul Hall to the west; Multipurpose Science and Technology Building (MSTB) to the south; and the University Club to the east. The addition of an academic facility in the Academic Core would be consistent with existing adjacent uses.

The proposed project would not affect the land use pattern of the surrounding community, either on or off campus. No existing pedestrian, bikeways, roadways, or driveways would be removed as part of the project. Therefore, the proposed project would not divide an established community and no impact would occur. No mitigation is required.

b) Conflict with an Applicable Land Use Plan: No Impact

As discussed in Section 2.0, Project Description, the applicable land use plan is the 2007 LRDP and the University is the only agency with land use jurisdiction over projects located on the campus. The project site is designated as Academic and Support in the LRDP, which allows for educational and research uses. Furthermore, the up to 200,000 GSF proposed for the building is within the total space program identified for the Academic Core in the LRDP and analyzed in the LRDP EIR.

In addition, the proposed project would fall under the UC Sustainable Practices Policy and the Climate Action Plan (2016 Update). Please refer to Section 4.6, Greenhouse Gas Emissions, for a detailed analysis regarding the project's compliance. Therefore, the proposed project would not conflict with the LRDP or any other applicable plan adopted to mitigate environmental effects and no impact would occur. No mitigation is required.

c) Conflict with an Applicable Conservation Plan: No Impact

The project site is not located within a Habitat Conservation Plan, Natural Community Conservation Plan, or any other land conservation plan. Therefore, the proposed project would not conflict with an applicable conservation plan and no impact would occur. No mitigation is required.

Mitigation Measures

No mitigation measures are required.

4.10 Noise

Issues	Potentially Significant Impact	Project Impact Adequately Addressed in LRDP EIR	Less Than Significant with Project-level Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project result in:					
a) Exposure of persons to or generation of noise levels in excess of standards established in any applicable plan or noise ordinance, or applicable standards of other agencies?					X
b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?		X			
c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?				X	
d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?		X			
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project					X

Issues	Potentially Significant Impact	Project Impact Adequately Addressed in LRDP EIR	Less Than Significant with Project-level Mitigation Incorporated	Less Than Significant Impact	No Impact
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?					X

Discussion

Noise issues are discussed in Section 4.9 of the 2007 LRDP EIR.

a) *Noise Standards: No Impact*

The LRDP EIR uses the State of California Land Use Compatibility for Community Noise Environment to address potential noise impacts (page 4.9-7). School and office uses have a "normally acceptable" range of 50 to 70 dB CNEL. As discussed in the 2007 LRDP EIR, the primary increase in noise levels on and off campus would be through the increase in traffic (page 4.9-24). However, as discussed in Section 4.14, Transportation and Traffic, the proposed project would generate an additional 113 average daily trips (ADT) throughout the day and 10 AM and 10 PM peak hour trips, which is negligible.

Table 4.9-4 in the 2007 LRDP FEIR provides the existing traffic noise levels and estimated LRDP's implementation levels along UCI's roadway segments. The nearest roadway segment to the project site, East Peltason between South Circle View and Bison Avenue, is 65 dBA CNEL at 50 feet from the centerline, which is within the 50 to 70 dB CNEL range for school and office uses. Additionally, the proposed project site is located more than 200 feet from East Peltason Drive, and not within the 60 dBA CNEL contour (LRDP EIR, page 4.9-16). Therefore, the proposed project would not conflict with a noise standard and no impact would occur. No mitigation is required.

b) *Groundborne Vibration: Project Impact Adequately Addressed in the LRDP EIR*

The long-term operation of the proposed project, an academic building, would not involve railroads or substantial heavy truck operations that would generate ground-borne vibration that could be felt at surrounding uses. Therefore, the proposed project would not cause long-term vibration impacts at surrounding uses and no impact would occur.

As stated in Section 2.0, Project Description, construction of the proposed project would require the use of demolition equipment. Construction may create a nuisance level of vibration-generated noise to existing sensitive receivers in the surrounding area. Therefore, with implementation of LRDP EIR Noi-2A, which implements standard construction noise measures, impacts due to groundborne vibration would be reduced to a less than significant level.

c) Permanent Ambient Noise: Less than Significant Impact

The proposed project would construct a new building in the Academic Core, adjacent to existing development. Existing ambient noise sources in the immediate vicinity of the project site include occasional vehicular traffic from the existing surface parking lots and pedestrian traffic. As discussed in Section 4.14, Transportation and Traffic, due to the relatively small volume of traffic expected to be associated with the operation of the project, related traffic noise is not expected to result in substantial permanent increase in ambient noise levels in the project vicinity. Noise associated with indoor activities of an academic building would be similar to the existing uses surrounding the project site. Noise generated by rooftop mechanical equipment (air conditioning/heating) would not be audible beyond the project site with typical sound attenuation features to be included in the project design. Therefore, impacts to permanent ambient noise levels would less than significant. No mitigation is required.

d) Temporary Ambient Noise: Project Impact Adequately Addressed in the LRDP EIR

Project construction, as stated in the LRDP EIR (page 4.9-31) is projected to require conventional construction techniques and standard equipment such as scrapers, graders, backhoes, loaders, tractors, cranes, and miscellaneous trucks. Specialized construction activities that generate unusually loud and repetitive noise such as pile driving would not be required to complete the project. A range of truck types would be required to transport machinery, supplies, remove waste materials, etc. on and off-site during the project's various construction stages. The heaviest of these trucks would likely be required during the grading phase; however, construction-related truck traffic would comply with the City of Irvine's Designated and Restricted Truck Routes.

As indicated in the LRDP EIR, the project would generate noise that could expose nearby receptors to elevated noise levels during its approximately 24-month construction period. The magnitude of the impact would depend on the type and duration of the activity, type of construction equipment used, distance between the noise source and receiver, and intervening structures, topography, and barriers. Noise generated by the types of construction equipment listed above would range from 60 to 90dBA at 50 feet from the source and propagates as a point source that decays at a rate of 6dB per doubling of distance from the source, and project construction activities would be expected to be audible in the immediate area (LRDP EIR, page 4.9-32). Therefore, LRDP EIR mitigation measure Noi-2A would limit construction operations to daytime hours, require proper equipment maintenance and muffling devices, and place restrictions on weekend construction activities, which would reduce temporary noise impacts to a less than significant level.

e) Public Airport Noise: No Impact

As discussed in the 2007 LRDP EIR (page 4.9-33), the nearest airport, John Wayne, 60 CNEL contour does not extend to the UCI campus. Therefore, the proposed project would not be subject to aircraft noise in excess of regulatory limits and no impact would occur. No mitigation is required.

f) Private Airport Noise: No Impact

There are no private airstrips in the vicinity of the campus. Therefore, the proposed project would not be subject to excessive noise levels due to a private airport and no impact would occur. No mitigation is required.

Mitigation Measures

Noi-2A: Prior to initiating on-site construction for future projects that implement the 2007 LRDP, UCI shall approve contractor specifications that include measures to reduce construction/demolition noise to the maximum extent feasible. These measures shall include, but are not limited to, the following:

i. Noise-generating construction activities occurring Monday through Friday shall be limited to the hours of 7:00 am to 7:00 pm, except during summer, winter, or spring break at which construction may occur at the times approved by UCI.

ii. Noise-generating construction activities occurring on weekends in the vicinity of (can be heard from) off-campus land uses shall be limited to the hours of 9:00 am to 6:00 pm on Saturdays, with no construction occurring on Sundays or holidays.

iii. Noise-generating construction activities occurring on weekends in the vicinity of (can be heard from) on-campus residential housing shall be limited to the hours of 9:00 amto 6:00 pm on Saturdays, with no construction on Sundays or holidays. However, as determined by UCI, if on-campus residential housing is unoccupied (during summer, winter, or spring break, for example), or would otherwise be unaffected by construction noise, construction may occur at any time.

iv. Construction equipment shall be properly outfitted and maintained with manufacturer recommended noise-reduction devices to minimize construction-generated noise.

v. Stationary construction noise sources such as generators, pumps or compressors shall be located at least 100 feet from noise-sensitive land uses (i.e., campus housing, classrooms, libraries, and clinical facilities), as feasible.

vi. Laydown and construction vehicle staging areas shall be located at least 100 feet from noise-sensitive land uses (i.e., campus housing, classrooms, libraries, and clinical facilities), as feasible.

vii. All neighboring land uses that would be subject to construction noise shall be informed at least two weeks prior to the start of each construction project, except in an emergency situation.

viii. Loud construction activity such as jackhammering, concrete sawing, asphalt removal, pile driving, and large-scale grading operations occurring within 600 feet of a residence or an academic building shall not be scheduled during any finals week of classes. A finals schedule shall be provided to the construction contractor.

4.11 Population and Housing

Issues	Potentially Significant Impact	Project Impact Adequately Addressed in LRDP EIR	Less Than Significant with Project-level Mitigation Incorporated	Less Than Significant Impact	No Impact
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)?				X	
b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?					X
c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?					X

Discussion

Population and housing issues are discussed in Section 4.10 of the 2007 LRDP EIR.

a) Induce Substantial Population Growth: Less than Significant Impact

The proposed project would construct a high-rise structure with laboratory and instructional space. In order to operate the new structure, it is anticipated approximately 70 new full-time faculty and staff would be hired, significantly less than 0.1 percent of the existing on-campus population. In addition, instructional space would be utilized by approximately 200 existing students and would not directly increase enrollment. With the inclusion of the 70 new faculty and staff, it would be within the total population envelope analyzed within the 2007 LRDP EIR. Therefore, the proposed project would not substantially induce population growth directly or indirectly and impacts would be less than significant. No mitigation is required.

b) Displace Existing Housing: No Impact

c) Displace a Substantial Number of People: No Impact

No existing housing would be demolished during construction. Therefore, the proposed project would not displace people or housing that would require the construction of replacement housing elsewhere and no impact would occur. No mitigation is required.

Mitigation Measures

No mitigation measures are required.

4.12 Public Services

Issues	Potentially Significant Impact	Project Impact Adequately Addressed in LRDP EIR	Less Than Significant with Project-level Mitigation Incorporated	Less Than Significant Impact	No Impact
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:					
a) Fire protection?				**X**	
b) Police protection?				**X**	
c) Schools?				**X**	
d) Parks?				**X**	
e) Other public facilities?				**X**	

Discussion

Public service issues are discussed in Section 4.11 of the 2007 LRDP EIR.

a) Fire Protection: Less than Significant

Fire protection and emergency response services to the campus are provided by the Orange County Fire Authority (OCFA). The primary responder serving the campus, OCFA Fire Station #4, is located north of the campus on the corner of California and Harvard Avenues. Of the station's calls, UCI generated 923 calls, or approximately 38%, during 2016. According to an analysis conducted by OCFA in November 2006, this station had adequate capacity to accommodate existing demand on the main campus. Built in 1966, the station has no current plans for its expansion (LRDP EIR, page 4.11-6).

As discussed in Section 4.11, Population and Housing, the proposed project would increase the full-time faculty and staff population by 70. Due to the negligible increase of population, it would not significantly increase demand for fire services. Furthermore, the project site is located within a five travel minute coverage area by OCFA. In 2016, the average response time to UCI was six minutes and 56 seconds, which is within the standard adopted by OCFA, where a unit should be on-site within seven minutes and 20 seconds for 80 percent of emergency calls.[1]

UCI employs a State Fire Marshal whom is responsible for the campus fire prevention practices and provides services such as plan review and construction inspections. The UCI Fire Marshal reviews and approves all development plans for each new campus project in accordance with California building and fire codes (LRDP EIR, page 4.11-7). Additionally, the building is within the allotted GSF for engineering, science, and research space analyzed within the 2007 LRDP EIR, which concluded that chemical usage would increase by approximately 140 percent at buildout. However, because all laboratory space would be constructed in compliance with fire protection regulations, it would not greatly increase the demand for fire protection services (page 4.11-7). Therefore, the proposed project would not require the need for new fire protection facilities and impacts to services would be less than significant. No mitigation is required.

b) Police Protection: Less than Significant

The UCI Police Department (UCIPD) is located in the Public Services building on the East Campus approximately one-half mile northeast of the project site. The UCIPD provides all police services (all patrol, investigation, crime prevention education, and related law enforcement duties) for the campus (LRDP EIR, page 4.11-3).

As discussed in Section 4.11, Population and Housing, the proposed project would increase the full-time faculty and staff by 70, or significantly less than 0.1 percent of the campus population, and would not result in an increase in demand for police services. Furthermore, there are no current plans to expand or construct additional police facilities on the campus. Therefore, the proposed project would not require the construction of new police facilities and impacts to services would be less than significant. No mitigation is required.

c) Schools: Less than Significant

The Irvine Unified School District (IUSD) provides kindergarten through grade 12 (k-12) public education services for school age children residing on or near the UCI campus. As discussed above and in Section 4.11, Population and Housing, the proposed project would not substantially increase the campus population. Therefore, the proposed project would not require the need for new off-campus educational facilities and impacts to services would be less than significant. No mitigation is required.

d) Parks: Less than Significant Impact

As discussed in Section 4.11, Population and Housing, the proposed project would increase full-time faculty and staff by 70, or significantly less than 0.1 percent of the campus population. Existing on-campus recreational facilities located throughout the campus, including Aldrich

[1] http://www.ocfa.org/Uploads/Orange%20County%20Fire%20Authority%20SOC_FINAL.pdf. Accessed July 18, 2017.

Park, Crawford Athletics Complex, and the Anteater Recreation Center have sufficient capacity to support the project and would not require the construction of new park facilities. Therefore, impacts to parks would be less than significant. No mitigation is required.

e) Other Public Facilities: Less than Significant

As discussed above and in Section 4.11, Population and Housing, the proposed project would not substantially increase on-campus population. Furthermore, public facilities, such as libraries, exist on-campus and would not result in the need for the construction of new facilities within the surrounding community. Therefore, impacts to other public facilities would be less than significant. No mitigation is required.

Mitigation Measures

No mitigation measures are required.

4.13 Recreation

Issues	Potentially Significant Impact	Project Impact Adequately Addressed in LRDP EIR	Less Than Significant with Project-level Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:					
a) Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?				X	
b) Include recreational facilities or require the construction or expansion of recreational facilities, which might have an adverse physical effect on the environment?					X

Discussion

Recreation issues are discussed in Section 4.12 of the 2007 LRDP EIR.

a) Physically Deteriorate Existing Facilities: Less than Significant Impact

As discussed in Section 4.11, Population and Housing, the proposed project would not substantially increase faculty, staff, or student populations on the campus that could cause substantial accelerated deterioration of recreational uses on or off-campus. In addition, campus populations have access to on-campus recreational facilities, including the Anteater Recreation Center (ARC), Aldrich Park, and Crawford Athletics Complex, and the 2007 LRDP EIR assumed that the current level of maintenance of these uses would continue and that substantial facility deterioration would not occur (page 4.12-5). Therefore, impacts to recreational facilities would be less than significant. No mitigation is required.

b) Construction of Recreational Facilities: No Impact

The proposed project would construct an academic building, and recreational facilities are not included in the scope. Therefore, no impacts due to construction of recreational facilities would occur. No mitigation is required.

Mitigation Measures

No mitigation measures are required.

4.14 Transportation/Traffic

Issues	Potentially Significant Impact	Project Impact Adequately Addressed in LRDP EIR	Less Than Significant with Project-level Mitigation Incorporated	Less Than Significant Impact	No Impact
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?				X	
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?					X
c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?					X

Issues	Potentially Significant Impact	Project Impact Adequately Addressed in LRDP EIR	Less Than Significant with Project-level Mitigation Incorporated	Less Than Significant Impact	No Impact
d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?				X	
e) Result in inadequate emergency access?				X	
f) Conflict with adopted policies plans or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?					X

Discussion

Transportation and traffic issues are discussed in Section 4.13 of the 2007 LRDP EIR, which is based on the traffic study prepared by Austin-Foust Associates, Inc. (now Stantec Consulting Services, Inc.) in 2007. In addition, a 2017 project-level study was prepared by Stantec Consulting Services, Inc. (Appendix C).

a) Performance of the Circulation System: Less than Significant Impact

As discussed in Section 4.11, Population and Housing, the anticipated campus population increase due to the proposed project is approximately 70 new faculty and staff. Trip generation rates for the proposed project are based on the UCI Main Campus Traffic Model trip rates for Faculty. As shown in Table 4.14-1, the project would generate a total of 113 daily trips (UCI faculty proportion of commuters is 70 x 0.85 = 60; UCI faculty person trips per commute = 60 x 1.9 =113), of which 10 would occur during the AM peak hour and the PM peak hour.

Trip Distribution

The trips generated by the project would use Peltason Drive, Campus Drive, California Avenue, and Bison Avenue to access the surrounding streets. Project trip distribution was determined based on ADT volume forecasts from the UCI MCTM. Approximately 65 percent of project trips are oriented toward the east on Peltason Drive continuing along Anteater and Campus Drive. Approximately 35 percent of project trips are oriented toward the west on Peltason Drive and continuing along Academy Way and Bison Avenue.

Table 4.14-1

Proposed Project Trip Generation Summary

ADT Trip Rates for Faculty

Category	Unit	Proportion of Commuters	Person Trips/Commuter
1. Faculty	person	0.85	1.9

Source: UCI LRDP Update 2007

Peak Hour Trip Rates (Percent of ADT)

Description	AM Peak Hour		PM Peak Hour	
	Inbound	Outbound	Inbound	Outbound
Academic	8.0%	0.7%	2.0%	7.5%

Source: UCI Main Campus Traffic Model (UCIMCTM)

Project Trip Generation

Category	Amount	AM Peak Hour			PM Peak Hour			ADT
		Inbound	Outbound	Total	Inbound	Outbound	Total	
Faculty	70	9	1	10	2	8	10	113
ADT = Average Daily Trips								

Near-term (Year 2020) Analysis

The proposed project would generate 113 average daily trips with 10 AM and 10 PM peak hour trips.

Table 4.14-2 summarizes the 2020 with-project AM and PM peak hour ICU and delay values for the study intersections, which shows that with the addition of the proposed project, all the signalized study intersections would operate at LOS A and LOS B during the AM and PM peak hours. At the stop controlled intersections, West Peltason Drive/Academy Way at West Peltason Drive would operate at LOS C during the AM peak hour and unacceptable LOS F during the PM peak hour, and Los Trancos at East Peltason Drive would operate at an unacceptable LOS F during both the AM and PM peak hours.

For signalized intersections, significant impacts are defined as an increase of 0.02 or more in the ICU value that result in LOS E or LOS F conditions. For stop-controlled study intersections if the LOS reaches E or F, the intersection is evaluated further for possible improvements with a traffic signal.

Table 4.14-2
2020 with-Project Intersection LOS Summary

Intersection	2020 No-Project				2020 with project			
	AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
	ICU/Delay	LOS	ICU/Delay	LOS	ICU/Delay	LOS	ICU/Delay	LOS
ICU Methodology - Signalized Intersections								
1. E Peltason Dr & Bison Ave	0.54	A	0.66	B	0.54	A	0.66	B
3. California Ave & Bison Ave	0.54	A	0.64	B	0.54	A	0.64	B
4. SR-73 NB Ramps & Bison Ave	0.56	A	0.67	B	0.56	A	0.67	B
5. SR-73 SB Ramps & Bison Ave	0.41	A	0.28	A	0.41	A	0.28	A
7. Anteater & E Peltason	0.45	A	0.61	B	0.46	A	0.62	B
8. E Peltason/Berkeley & Campus	0.41	A	0.52	A	0.41	A	0.52	A
9. Anteater/Shady Canyon & Culver	0.41	A	0.48	A	0.41	A	0.48	A
HCM Delay Methodology - Stop Controlled Intersections								
2. W Peltason Dr/Academy & W Peltason Dr	17 sec	C	50 sec	F	17 sec	C	51 sec	F
6. Los Trancos & E Peltason	74 sec	F	157 sec	F	76 sec	F	160 sec	F

The signalized intersections under near-term conditions with the addition of the proposed project would operate at an acceptable LOS A and LOS B and would not be significantly impacted with the addition of the proposed project. The two stop-controlled intersections would operate at LOS F without the addition of the project, and with the project, the stop-controlled intersections would continue to operate at an unacceptable LOS F. However, both intersections have been previously identified for installation of a traffic signal in the LRDP, which would improve the level of service to LOS A and LOS B. The Los Trancos/East Peltason Drive traffic signal would be installed and operational in January 2018 and would alleviate the congestion on-campus. Therefore, impacts to the surrounding circulation system would be less than significant. No mitigation is required.

b) Conflict with Congestion Management Program: No Impact

The nearest elements of the Orange County Congestion Management Plan (CMP) highways and arterials network are Jamboree Road and MacArthur Boulevard located approximately 1.5 miles from the project site. CMP monitoring is conducted at the intersections of Jamboree Road/I-405 northbound and southbound ramps and at Jamboree Road/MacArthur Boulevard (LRDP FEIR VI page 4.13-23). The CMP indicates that a significant impact may occur if a project generates more than 2,400 or more vehicle trips per day or contributes 1,600 or more vehicle trips per day into the CMP highway system. As discussed in 4.14(a) above, the project would generate approximately 113 ADT, which is significantly below the CMP threshold. Therefore, it would not conflict with the CMP and no impact would occur. No mitigation is required.

c) Air Traffic Patterns: No Impact

The proposed project site is located approximately two miles southeast of JWA. The Initial Study prepared for the 2007 LRDP concluded that the campus is not situated under the preferred arrival or departure tracks associated with the airport and that future campus buildings would not penetrate the 100:1 Imaginary Surface for designated flight patterns (LRDP EIR VII page 25). Therefore, the proposed project would not affect air traffic patterns and no impact would occur. No mitigation is required.

d) Hazards Due to a Design Feature: Less than Significant Impact

All of the project's transportation network would be designed in accordance with the same standards applied to other elements of the campus transportation network and would have no unique aspects not anticipated in the LRDP EIR. The 2007 LRDP EIR determined no impacts would occur from hazards due to design features or incompatible uses, which was addressed in the LRDP Initial Study (LRDP EIR, page 4.13-61). Therefore, impacts due to potential hazards of a design feature would be less than significant. No mitigation is required.

e) Inadequate Emergency Access: Less than Significant Impact

The service road located to the east of the project site would be closed while underdoing realignment and widening; however, access by fire protection, ambulances, police, or other emergency vehicles would be maintained for the active construction zones and surrounding land uses. All closures during construction would be reviewed by the UCI Fire Marshal prior to construction to ensure adequate emergency access at all times. Therefore, with review of the proposed project by the UCI Fire Marshal, impacts related to emergency access would be less than significant. No mitigation is required.

f) Public Transit, Bicycle, or Pedestrian Facilities: No Impact

UCI administers an extensive program of Transportation Demand Management (TDM) measures that encourage commuters to use alternate modes of transportation, including walking, bicycling, carpooling, vanpooling, and riding the UCI shuttle, other local shuttle systems, train, or bus. With these measures, UCI has been successful in achieving an average vehicle ridership higher than the AQMD regional goal (LRDP EIR, page 4.13-58). As such, the proposed project would not require the removal of transit routes, pedestrian walkways, or bicycle paths, and would not hinder implementation of TDM measures on the campus. Therefore, the proposed project would not conflict with alternative transportation plans, policies and programs and no impact would occur. No mitigation is required.

Mitigation Measures

No mitigation measures are required.

4.15 Utilities and Service Systems

Issues	Potentially Significant Impact	Project Impact Adequately Addressed in LRDP EIR	Less Than Significant with Project-level Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:					
a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?					X
b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?				X	
c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?				X	
d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?				X	

Issues	Potentially Significant Impact	Project Impact Adequately Addressed in LRDP EIR	Less Than Significant with Project-level Mitigation Incorporated	Less Than Significant Impact	No Impact
e) Result in a determination by the wastewater treatment provider, which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?				X	
f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?				X	
g) Comply with applicable federal, state, and local statutes and regulations related to solid waste?					X

Discussion

Utilities and service systems issues are discussed in Section 4.14 of the 2007 LRDP EIR.

a) *Regional Water Quality Control Board Wastewater Treatment Requirements: No Impact*

Wastewater from the proposed project would be discharged to the campus' sanitary sewer network, which conveys flows to the Irvine Ranch Water District (IRWD) wastewater treatment system. Wastewater from the UCI campus is treated at the Michelson Water Reclamation Plant (MWRP), which provides a tertiary level of treatment in accordance with the wastewater treatment standards enforced by the Santa Ana Regional Water Quality Control Board (RWQCB).

Furthermore, in compliance with the General Permit for Waste Discharge Requirements for Storm Water Discharges from Small Municipal Separate Storm Sewer Systems (MS4s), the campus implements a Stormwater Management Plan and all contractors must comply with UCI's Stormwater Pollution Prevention Best Management Practices (BMPs). A project-specific

Stormwater Pollution Prevention Plan (SWPPP), in compliance with the RWQCB, would be completed prior to the start of construction. Therefore, the proposed project would not exceed wastewater treatment requirements of the Regional Water Quality Control Board and no impact would occur. No mitigation is required.

b) Construction of New Water or Wastewater Treatment Facilities or Expansion of Existing Facilities: Less than Significant Impact

Water and wastewater infrastructure would be constructed on-site to serve the proposed project, and the new infrastructure would connect to existing distribution systems. Potable and reclaimed water service and wastewater collection and treatment service would be provided by IRWD.

Construction impacts would occur as part of the general site development phase while utility improvements are installed; however, no alterations to existing main line facilities would be required to provide adequate potable or irrigation water flows to this project, or to provide sufficient sanitary sewer service. Furthermore, it is estimated that by 2025 UCI would contribute to approximately 19 percent of IRWD's total treated wastewater, and would be accommodated by planned increases of wastewater treatment capacity by IRWD (LRDP EIR, page 4.14-15). Therefore, construction of these components would not result in the construction of new or expansion of water or wastewater treatment facilities and impacts would be less than significant. No mitigation is required.

c) Stormwater Drainage Facilities: Less Than Significant Impact

As discussed in Section 4.8, Hydrology and Water Quality, existing hydrology patterns on the site would be maintained to the extent practical as determined during the project's final design stage through the use of best management practices to convey runoff from the project. Waste water runoff and stormwater facilities are regulated by the MS4 requirements, including stormwater collection and treatment BMPs, which would reduce physical impacts associated with the construction of new stormwater drainage facilities. Therefore, in compliance with the MS4 permit, impacts due to stormwater drainage facilities would be less than significant. No mitigation is required.

d) Water Supplies: Less than Significant Impact

The 2015 IRWD Urban Water Management Plan (UWMP, 2015) projects district-wide water supply availability and demand through 2035. IRWD staff in consultation with UCI reviewed projected water service demand related to implementation of the 2007 LRDP for consistency with the 2005 UWMP and concluded that water supply reliability would not be compromised (LRDP EIR, page 4.14-17). The 2007 LRDP buildout has been included in the recent 2015 UWMP. Because the proposed project does not increase campus population or estimated water demand beyond what was analyzed in the 2007 LRDP EIR, the irrigation needs throughout the campus would continue to be fully met through reclaimed water supplies.

Although implementation of the 2007 LRDP would result in less than significant impacts to water supply, UCI continues to cooperatively and continually work with IRWD to reduce domestic water demand on campus consistent with UCI sustainability goals, as follows:

- Continue to use reclaimed water for all landscape irrigation uses where feasible and permissible by law.
- Work with IRWD to identify opportunities for additional uses of reclaimed water on-campus to reduce domestic water demand including central utility plant applications, dual plumbing systems in buildings, and other applications to reduce demand for domestic water.
- Work collaboratively with IRWD to identify feasible programs, projects, and measures to reduce domestic water demand.

Therefore, because the proposed project's domestic and reclaimed water demand is consistent with the projections developed for the 2007 LRDP EIR and anticipated in the UWMP forecasts, impacts would be less than significant. No mitigation is required.

e) Wastewater Capacity: Less than Significant Impact

The Michaelson Water Recycling Plant (MWRP) currently treats up to 28 million gallons per day (mgd) of wastewater, and an additional upgrade to 33 mgd is scheduled to be completed in 2025. IRWD forecasts a total service area demand for wastewater treatment of 26.11 mgd by 2025, including the projected increase associated with full implementation of the 2007 LRDP. Because the proposed project is consistent with the LRDP EIR as discussed in Section 2.0, Project Description, the MWRP would have sufficient capacity to accommodate the anticipated wastewater generation throughout the IRWD service area. Therefore, the impact to wastewater treatment capacity would be less than significant (LRDP EIR, pages 4.14-12 through 13). No mitigation is required.

f) Landfill Capacity: Less than Significant Impact

The Frank R. Bowerman Landfill is permitted to receive a daily maximum of 11,500 tons per day and is expected to close in the year 2053. The Olinda Landfill and Prima Deshecha Landfill also serve the County of Orange, which are utilized if the Frank R. Bowerman Landfill reaches its daily capacity. Olinda Landfill permits 8,000 tons daily with an expected closure in 2030; Prima Deshecha Landfill is scheduled to close in 2067 and permits 4,000 tons daily.

Orange County Waste & Recycling and the three landfills are in compliance with the California Integrated Waste Management Act of 1989 (AB 939), which requires each jurisdiction to maintain 15 years of solid waste disposal capacity. Therefore, based on available landfill capacity, impacts would be less than significant. No mitigation is required.

g) Solid Waste Regulations: No Impact

The University of California is not subject to Assembly Bill 939 or other local agency regulations pertaining to solid waste management. Nonetheless, the University of California has adopted the Sustainable Practices Policy that requires campuses to undertake aggressive programs to reduce solid waste generation and disposal (LRDP EIR, 4.14-20). This includes voluntary compliance with the State Agency Integrated Waste Management Plan and prioritization of waste and recycling for LEED credits, including a life cycle assessment for reuse of building materials. Furthermore, under Section F, Recycling and Waste Management, requires the ultimate goal of zero waste by 2020. As of 2016, the campus has an 81 percent diversion rate from local landfills that has been achieved through recycling, composting, and reusing. Continued outreach programs, increased sustainable purchasing options, and proper hazardous waste disposal have the campus on track to reach 95 percent, or “zero waste,” by 2020. The project would not require any unique waste collection or disposal methods or facilities and would not conflict with or obstruct any federal, State, or local programs to reduce solid waste generation. Therefore, the proposed project would not violate solid waste regulations and no impact would occur. No mitigation is required.

Mitigation Measures

No mitigation measures required.

4.16 Mandatory Findings of Significance

Issues	Potentially Significant Impact	Project Impact Adequately Addressed in LRDP EIR	Less Than Significant with Project-level 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, substantially reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?				X	
b) Does the project have impacts that are individually limited, but cumulatively considerable? (“Cumulatively considerable” means that the incremental effects of a project are significant when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of past, present, and probably future projects?)				X	

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

a) Degrade the Environment, Reduce Habitat or Wildlife Populations, Eliminate Examples of California History: Less than Significant Impact

As discussed under Section 4.1 through 4.13, no significant environmental impacts were identified in the responses to questions regarding project effects. The project site does not contain, support, or connect to any sensitive biological resources nor does it adversely affect any such resources. There are no historic resources on this undeveloped site and in the unexpected event that a prehistoric or archaeological resource is discovered during grading, compliance with LRDP EIR mitigation measures Cul-1C, Cul-4A, Cul-4B, and Cul-4C would reduce impacts to a less than significant level.

b) Cumulatively Considerable Impacts: Less Than Significant Impact

Long-term environmental consequences resulting from the cumulative effect of completing development through implementation of the 2007 LRDP were thoroughly evaluated in the 2007 LRDP EIR. As discussed in Section 2.0, Project Description, the project is consistent with the LRDP land use policies. No new or increased severity of impacts beyond what was anticipated in the 2007 LRDP EIR have been identified as a result of the analysis completed for this IS/MND. As discussed in Sections 4.1 through 4.15, project-level impacts have been determined to be less than significant, no impact, or mitigated to a less than significant level. Therefore, the proposed project would not result in cumulatively considerable impacts.

c) Direct or Indirect Effects on Humans: Less Than Significant Impact

No significant impacts on human beings have been identified in this IS/MND. Short-term adverse impacts during the construction phase (dust, exhaust emissions, and noise) would be less than significant with the incorporation and implementation of the identified routine control measures set forth in the LRDP EIR and project-specific mitigation. There is no evidence of site contamination with hazardous wastes or substances. The laboratories would involve consumption, generation, transport or disposal of hazardous materials; however, as with all other laboratory buildings on-campus, delivery services would comply with all federal and State guidelines. All chemical disposals are managed and monitored by UCI's Office of Environmental Health and Safety. Access to the project site by emergency vehicles would be maintained throughout construction, and the developed site would not constrain emergency access to any portion of the campus. Therefore, impacts due to direct or indirect effects on humans would be less than significant.

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APPENDIX A

Air Quality Assessment

AIR QUALITY ASSESSMENT

UCI Interdisciplinary Sciences Building Project

PREPARED BY:

Michael Baker INTERNATIONAL

Michael Baker

INTERNATIONAL

AIR QUALITY ASSESSMENT

for the

UCI Interdisciplinary Sciences Building Project

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July 20, 2017

JN 161093

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SYMBOLS, ABBREVIATIONS, AND ACRONYMS

AB	Assembly Bill
AQMP	Air Quality Management Plan
Basin	South Coast Air Basin
BAU	business as usual
CAAQS	California Ambient Air Quality Standards
CAFE	corporate average fleet fuel economy
CalGreen	California Green Building Standards
CARB	California Air Resources Board
CCAA	California Clean Air Act
CEQA	California Environmental Quality Act
CFCs	Chlorofluorocarbons
CH_4	Methane
CO	carbon monoxide
CO_2	carbon dioxide
CO_2eq	carbon dioxide equivalent
EAP	Energy Action Plan
EECAP	energy efficiency climate action plans
EPA	U.S. Environmental Protection Agency
FCAA	Federal Clean Air Act
GHG	greenhouse gas
GSF	gross square foot
GWP	Global Warming Potential
H_2O	water vapor
HCFCs	Hydrochlorofluorocarbons
HFCs	Hydrofluorocarbons
hp	horsepower
HPLV	high-pressure-low-volume
HVAC	heating, ventilation, and air conditioning
I-4	Environmental Justice Enhancement Initiative
IPCC	International Panel for Climate Change
lbs	pounds
LEED	Leadership in Engineering and Environmental Design
LOS	level of service
LSTs	Localized Significance Thresholds
Metro	Los Angeles County Metropolitan Transportation Authority
MMT	million metric tons
mpg	miles per gallon
MPO	metropolitan planning organization
$MTCO_2eq$	metric tons of carbon dioxide equivalents
MU-T	Mixed-Use Transit
N_2O	nitrous oxide

NAAQS	National Ambient Air Quality Standards
NO_2	nitrogen dioxide
NO_x	nitrogen oxides
OAL	Office of Administrative Law
O_3	ozone
OPR	Office of Planning and Research
PFCs	Perfluorocarbons
PM_{10}	particulate matter less than 10 microns in diameter
$PM_{2.5}$	particulate matter less than 2.5 microns in diameter
ppm	parts per million
PST	Pacific Standard Time
RCP	Regional Comprehensive Plan
RH	relative humidity
ROG	Reactive Organic Gasses
RTP	Regional Transportation Plan
SB	Senate Bill
SCAG	Southern California Association of Governments
SCAQMD	South Coast Air Quality Management District
SCE	Southern California Edison
SCS	Sustainable Community Strategy
SF_6	Sulfur hexafluoride
SGVCOG	San Gabriel Valley Council of Governments
SGVEWP	San Gabriel Valley Energy Wise Partnership
SIP	State Implementation Plan
SO_2	sulfur dioxide
SO_x	sulfur oxides
SRA	Source receptor Area
UNFCCC	United Nations Framework Convention on Climate Change
$\mu g/m^3$	micrograms per cubic meter
UV-B	ultraviolet B rays
VMT	vehicle miles traveled
VOC	Volatile Organic Compound

EXECUTIVE SUMMARY

The purpose of this Air Quality Assessment is to evaluate potential short- and long-term air quality impacts resulting from implementation of the proposed Interdisciplinary Science Building (ISB) Project ("project" or "proposed project") on the University of California, Irvine (UCI) campus. The project is located at the southwest corner of the Ring Mall near the intersection of East Peltason Drive and South Circle View Drive, on the UCI campus.

The project proposes to demolish an existing 160,000-gross-square-foot (GSF) parking lot to construct up to a 200,000 GSF, eight-story structure on an approximately 3.5-acre site. Construction would start in early 2018, lasting over 24 months. It is expected that the campus population would encompass up to 70 faculty and 200 student researchers and staff. The ISB would contain a wet laboratory, an office, a shared auditorium for instruction, a building support and storage area, and shell space.

Temporary Impacts. Mitigated construction emissions from project implementation would not exceed established South Coast Air Quality Management District (SCAQMD) thresholds.

Long-Term Impacts. The analysis has demonstrated that project implementation would result in less than significant long-term regional and localized air quality impacts. Carbon monoxide hot-spots impacts would also be less than significant. The proposed project would result in less than significant impacts for all long-term operational emissions.

Cumulative Impacts. The proposed project would not result in long-term air quality impacts, as emissions would not exceed the SCAQMD adopted operational thresholds. Additionally, adherence to SCAQMD rules and regulations would alleviate potential impacts related to cumulative conditions on a project-by-project basis. The project would not result in significant operational emissions of criteria pollutants.

1.0 INTRODUCTION

The purpose of this Air Quality Assessment is to evaluate potential short- and long-term air quality impacts resulting from implementation of the proposed Interdisciplinary Sciences Building (ISB) Project ("project" or "proposed project") on the University of California, Irvine (UCI) campus.

1.1 PROJECT LOCATION

The project site is located 0.85 miles east of State Route 73 (SR-73) and 2.13 miles south of Interstate 405 (I-405); refer to Exhibit 1, *Regional Vicinity*. Locally, the project is located at the southwest corner of the Ring Mall near the intersection of East Peltason Drive and South Circle View Drive, on the UCI campus; refer to Exhibit 2, *Site Vicinity*.

The project site is located southwest of the Physical Sciences Lecture Hall and Physical Sciences Classroom Building, northwest of the Multipurpose Science and Technology Building, east of the University Club, and southeast of Croul Hall. On-campus residential Campus Village student housing lies northeast across Bison Avenue; Middle Earth student housing lies to the northeast; University Hills staff and faculty housing lies to the southeast.

1.2 PROJECT DESCRIPTION

The project proposes to demolish an existing 160,000-gross-square-foot (GSF) parking lot to construct up to a 200,000 GSF, eight-story structure on an approximately 3.5-acre site); refer to Exhibit 3, *Site Development Plan*. Construction would start in early 2018, lasting over 24 months. It is expected that the campus population would encompass up to 70 faculty and 200 student researchers and staff. The ISB would contain a wet laboratory, an office, a shared auditorium for instruction, a building support and storage area, and shell space.

not to scale

07/13/17 JN161093 MAS

UCI INTERDISCIPLINARY SCIENCE BUILDING PROJECT • AIR QUALITY ASSESSMENT

Regional Vicinity

Exhibit 1

Michael Baker INTERNATIONAL

Source: Aerial - Google Earth Pro, July 2017

Michael Baker
INTERNATIONAL

not to scale

07/13/17 JN161093 MAS

UCI INTERDISCIPLINARY SCIENCE BUILDING PROJECT • AIR QUALITY ASSESSMENT

Site Vicinity

Exhibit 2

Source: HKS 2016

Site Development Plan

Exhibit 3

2.0 ENVIRONMENTAL SETTING

The California Air Resources Board (CARB) divides the State into 15 air basins that share similar meteorological and topographical features. The project site lies within the northwestern portion of the South Coast Air Basin (Basin). The Basin is a 6,600-square mile area bounded by the Pacific Ocean to the west and the San Gabriel, San Bernardino, and San Jacinto Mountains to the north and east. The Basin includes all of Orange County and the non-desert portions of Los Angeles, Riverside, and San Bernardino Counties, in addition to the San Gorgonio Pass area in Riverside County. The Basin's terrain and geographical location (i.e., a coastal plain with connecting broad valleys and low hills) determine its distinctive climate.

The general region lies in the semi-permanent high-pressure zone of the eastern Pacific. The climate is mild and tempered by cool sea breezes. The usually mild climatological pattern is interrupted infrequently by periods of extremely hot weather, winter storms, or Santa Ana winds. The extent and severity of the air pollution problem in the Basin is a function of the area's natural physical characteristics (weather and topography), as well as man-made influences (development patterns and lifestyle). Factors such as wind, sunlight, temperature, humidity, rainfall, and topography all affect the accumulation and/or dispersion of pollutants throughout the Basin.

CLIMATE

The average annual temperature varies little throughout the Basin, averaging 75 degrees Fahrenheit (°F). However, with a less-pronounced oceanic influence, the eastern inland portions of the Basin show greater variability in annual minimum and maximum temperatures. All portions of the Basin have had recorded temperatures over 100°F in recent years.

Although the Basin has a semi-arid climate, the air near the surface is moist due to the presence of a shallow marine layer. Except for infrequent periods when dry, continental air is brought into the Basin by offshore winds, the ocean effect is dominant. Periods with heavy fog are frequent, and low stratus clouds, occasionally referred to as "high fog," are a characteristic climate feature. Annual average relative humidity is 70 percent at the coast and 57 percent in the eastern part of the Basin. Precipitation in the Basin is typically nine to 14 inches annually and is rarely in the form of snow or hail due to typically warm weather. The frequency and amount of rainfall is greater in the coastal areas of the Basin.

The height of the inversion is important in determining pollutant concentration. When the inversion is approximately 2,500 feet above sea level, the sea breezes carry the pollutants inland to escape over the mountain slopes or through the passes. At a height of 1,200 feet, the terrain prevents the pollutants from entering the upper atmosphere, resulting in a settlement in the foothill communities. Below 1,200 feet, the inversion puts a tight lid on pollutants, concentrating them in a shallow layer over the entire coastal basin. Usually, inversions are lower before sunrise than during the day. Mixing heights for inversions are lower in the summer and more persistent, being partly responsible for the high levels of ozone (O_3) observed during summer months in the Basin. Smog in southern California is generally the result of these temperature inversions combining with coastal day winds and local mountains to contain the pollutants for long periods of time, allowing them to form secondary pollutants by reacting with sunlight. The Basin has a limited ability to disperse these pollutants due to typically low wind speeds.

The area in which the project is located offers clear skies and sunshine, yet is still susceptible to air inversions. These inversions trap a layer of stagnant air near the ground, where it is then further loaded with pollutants. These inversions cause haziness, which is caused by moisture, suspended dust, and a variety of chemical aerosols emitted by trucks, automobiles, furnaces, and other sources.

Irvine experiences average high temperatures of up to 83 degrees (˚) Fahrenheit (F) during the month of August, and average low temperatures of 47 ˚F during the month of December. The City experiences approximately 14.42 inches of precipitation per year, with the most precipitation occurring in the month of February.[1]

[1] U.S. Climate Data, *Climate Irvine - California*, http://www.usclimatedata.com/climate/irvine/california/united-states/usca2494, accessed on July 13, 2017.

3.0 STATE AND FEDERAL AMBIENT AIR QUALITY STANDARDS

3.1 AMBIENT AIR QUALITY STANDARDS

CARB and the U.S. Environmental Protection Agency (EPA) establish ambient air quality standards for major pollutants at thresholds intended to protect public health. The standards for some pollutants are based on other values such as protection of crops or avoidance of nuisance conditions. Table 1, *State and National Ambient Air Quality Standards and Attainment Status*, summarizes the State California Ambient Air Quality Standards (CAAQS) and the Federal National Ambient Air Quality Standards (NAAQS).

CARB designates all areas within the State as either attainment (having air quality better than the CAAQS) or nonattainment (having a pollution concentration that exceeds the CAAQS more than once in three years). Likewise, the EPA designates all areas of the U.S. as either being in attainment of the NAAQS or nonattainment if pollution concentrations exceed the NAAQS. Because attainment/nonattainment is pollutant-specific, an area may be classified as nonattainment for one pollutant and attainment for another. Similarly, because the State and national standards differ, an area could be classified as attainment for the Federal standard of a pollutant while it may be nonattainment for the State standard of the same pollutant. Some areas are unclassified, which means no monitoring data are available. Unclassified areas are considered to be in attainment. The attainment status of SCAQMD for CAAQS and NAAQS for the area where the proposed project is located is shown in Table 1 and is discussed in more detail below under "Ambient Air Monitoring."

3.2 AMBIENT AIR MONITORING

CARB monitors ambient air quality at approximately 250 air monitoring stations across the state. Air quality monitoring stations usually measure pollutant concentrations ten feet aboveground level; therefore, air quality is often referred to in terms of ground-level concentrations. The project site is located within Source Receptor Area (SRA) 20, Central Orange County Coastal. The closest air monitoring station to the project site is the Costa Mesa – Mesa Verde Drive Monitoring Station. Local air quality data from 2014 to 2016 is provided in Table 2, *Summary of Air Quality Data*. This table lists the monitored maximum concentrations and number of exceedances of Federal/State air quality standards for each year.

Ozone. Ozone (O_3) occurs in two layers of the atmosphere. The layer surrounding the earth's surface is the troposphere. The troposphere extends approximately 10 miles above ground level, where it meets the second layer, the stratosphere. The stratospheric (the "good" ozone) layer extends upward from about ten to 30 miles and protects life on earth from the sun's harmful ultraviolet rays (UV-B). "Bad" ozone is a photochemical pollutant, and needs volatile organic compounds (VOCs), Nitrogen Oxides (NO_X) and sunlight to form; therefore, VOCs and NO_X are ozone precursors. VOCs and NO_X are emitted from various sources throughout the

Table 1
State and National Ambient Air Quality Standards and Attainment Status

Pollutant	Averaging Time	California[1]		Federal[2]	
		Standard[3]	Attainment Status	Standards[3, 4]	Attainment Status
Ozone (O_3)	1 Hour	0.09 ppm (180 $\mu g/m^3$)	Nonattainment	N/A[5]	N/A[5]
	8 Hours	0.070 ppm (137 $\mu g/m^3$)	Nonattainment	0.070 ppm (137 $\mu g/m^3$)	Extreme Nonattainment
Particulate Matter (PM_{10})	24 Hours	50 $\mu g/m^3$	Nonattainment	150 $\mu g/m^3$	Serious/Maintenance
	Annual Arithmetic Mean	20 $\mu g/m^3$	Nonattainment	N/A[6]	N/A[6]
Fine Particulate Matter ($PM_{2.5}$)[7]	24 Hours	No Separate State Standard		35 $\mu g/m^3$	Serious Nonattainment
	Annual Arithmetic Mean	12 $\mu g/m^3$	Nonattainment	12 $\mu g/m^3$	Moderate Nonattainment
Carbon Monoxide (CO)	1 Hour	20 ppm (23 mg/m^3)	Attainment	35 ppm (40 mg/m^3)	Serious/Maintenance
	8 Hours	9.0 ppm (10 mg/m^3)	Attainment	9 ppm (10 mg/m^3)	Serious/Maintenance
Nitrogen Dioxide (NO_2)[8]	1 Hour	0.18 ppm (339 $\mu g/m^3$)	Unclassified/Attainment	0.100 ppm (188 $\mu g/m^3$)	Unclassified/Attainment
	Annual Arithmetic Mean	0.030 ppm (57 $\mu g/m^3$)	Attainment	0.053 ppm (100 $\mu g/m^3$)	Attainment/Maintenance
Lead (Pb)[9, 10]	30 days average	1.5 $\mu g/m^3$	Attainment	N/A	N/A
	Calendar Quarter	N/A	N/A	1.5 $\mu g/m^3$	Unclassified/Attainment
	Rolling 3-Month Average	N/A	N/A	0.15 $\mu g/m^3$	Unclassified/Attainment
Sulfur Dioxide (SO_2)[11]	1 Hour	0.25 ppm (655 $\mu g/m^3$)	Attainment	75 ppb (196 $\mu g/m^3$)	Designation Pending (Expect Unclassified/Attainment)
	24 Hours	0.04 ppm (105 $\mu g/m^3$)	Attainment	0.14 ppm (for certain areas)[12]	Unclassified/Attainment
	Annual Arithmetic Mean	N/A	N/A	0.030 ppm (for certain areas)	Unclassified/Attainment
Visibility-Reducing Particles[12]	8 Hours (10 a.m. to 6 p.m., PST)	Extinction coefficient = 0.23 km@<70% RH	Unclassified	No Federal Standards	
Sulfates	24 Hour	25 $\mu g/m^3$	Attainment		
Hydrogen Sulfide	1 Hour	0.03 ppm (42 $\mu g/m^3$)	Attainment		
Vinyl Chloride[9, 10]	24 Hour	0.01 ppm (26 $\mu g/m^3$)	Attainment		

$\mu g/m^3$ = micrograms per cubic meter; ppm = parts per million; ppb = parts per billion; km = kilometer(s); RH = relative humidity; PST = Pacific Standard Time; N/A = Not Applicable

1. California standards for ozone, carbon monoxide (except Lake Tahoe), sulfur dioxide (1- and 24-hour), nitrogen dioxide, suspended particulate matter-PM_{10} and visibility-reducing particles are values that are not to be exceeded. All others are not to be equaled or exceeded. California ambient air quality standards are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations. In 1990, CARB identified vinyl chloride as a toxic air contaminant, but determined that there was not sufficient available scientific evidence to support the identification of a threshold exposure level. This action allows the implementation of health-protective control measures at levels below the 0.010 ppm ambient concentration specified in the 1978 standard.
2. National standards (other than ozone, particulate matter, and those based on annual averages or annual arithmetic mean) are not to be exceeded more than once a year. The ozone standard is attained when the fourth highest eight hour concentration in a year, averaged over three years, is equal to or less than the standard. The EPA also may designate an area as attainment/unclassifiable, if: (1) it has monitored air quality data that show that the area has not violated the ozone standard over a three-year period; or (2) there is not enough information to determine the air quality in the area. For PM_{10}, the 24 hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 mg/m^3 is equal to or less than one. For $PM_{2.5}$, the 24 hour standard is attained when 98 percent of the daily concentrations, averaged over three years, are equal to or less than the standard.
3. Concentration expressed first in units in which it was promulgated. Equivalent units given in parentheses are based upon a reference temperature of 25°C and a reference pressure of 760 mm of mercury. Most measurements of air quality are to be corrected to a reference temperature of 25°C and a reference pressure of 760 mm of mercury (1,013.2 millibar); ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.
4. National Primary Standards: The levels of air quality necessary, with an adequate margin of safety, to protect the public health.
5. The Federal 1-hour ozone standard was revoked on June 15, 2005 in all areas except the 14 8-hour ozone nonattainment Early Action Compact (EAC) areas.
6. The EPA revoked the annual PM_{10} standard in 2006 (effective December 16, 2006).
7. On December 14, 2012, the national annual $PM_{2.5}$ primary standard was lowered from 15 $\mu g/m^3$ to 12.0 $\mu g/m^3$. The existing national 24-hour $PM_{2.5}$ standards (primary and secondary) were retained at 35 $\mu g/m^3$, as was the annual secondary standard of 15 $\mu g/m^3$. The existing 24-hour PM_{10} standards (primary and secondary) of 150 $\mu g/m^3$ also were retained. The form of the annual primary and secondary standards is the annual mean, averaged over 3 years.
8. On June 2, 2010, a new 1-hour SO_2 standard was established and the existing 24-hour and annual primary standards were revoked. To attain the 1-hour national standard, the 3-year average of the annual 99th percentile of the 1-hour daily maximum concentrations at each site must not exceed 75 ppb. The 1971 SO_2 national standards (24-hour and annual) remain in effect until one year after an area is designated for the 2010 standard, except that in areas designated nonattainment for the 1971 standards, the 1971 standards remain in effect until implementation plans to attain or maintain the 2010 standards are approved. Note that the 1-hour national standard is in units of ppb. California standards are in units of parts per million (ppm). To directly compare the 1-hour national standard to the California standard the units can be converted to ppm. In this case, the national standard of 75 ppb is identical to 0.075 ppm.
9. CARB has identified lead and vinyl chloride as "toxic air contaminants" with no threshold level of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.
10. The national standard for lead was revised on October 15, 2008 to a rolling 3-month average.
11. On June 2, 2010, a new 1-hour SO_2 standard was established and the existing 24-hour and annual primary standards were revoked. To attain the 1-hour national standard, the 3-year average of the annual 99th percentile of the 1-hour daily maximum concentrations at each site must not exceed 75 ppb. The 1971 SO_2 national standards (24-hour and annual) remain in effect until one year after an area is designated for the 2010 standard, except that in areas designated nonattainment for the 1971 standards, the 1971 standards remain in effect until implementation plans to attain or maintain the 2010 standards are approved. Note that the 1-hour national standard is in units of parts per billion (ppb). California standards are in units of parts per million (ppm). To directly compare the 1-hour national standard to the California standard the units can be converted to ppm. In this case, the national standard of 75 ppb is identical to 0.075 ppm.
12. In 1989, CARB converted both the general statewide 10-mile visibility standard and the Lake Tahoe 30-mile visibility standard to instrumental equivalents, which are "extinction of 0.23 per kilometer" and "extinction of 0.07 per kilometer" for the statewide and Lake Tahoe Air Basin standards, respectively.

Source: California Air Resources Board, March 2017, and U.S. Environmental Protection Agency, March 2017.

Table 2
Summary of Air Quality Data

Pollutant	California Standard	Federal Primary Standard	Year	Maximum Concentration[3]	Days (Samples) State/Federal Std. Exceeded
Ozone (O_3)[1] (1-hour)	0.09 ppm for 1 hour	NA[7]	2014 2015 2016	0.096 ppm 0.099 0.090	1/0 1/0 0/0
Ozone (O_3)[1] (8-hour)	0.070 ppm for 8 hours	0.070 ppm for 8 hours	2014 2015 2016	0.080 ppm 0.080 0.069	6/6 2/2 0/0
Carbon Monoxide (CO)[2] (1-hour)	20 ppm for 1 hour	35 ppm for 1 hour	2014 2015 2016	2.68 ppm 2.98 2.06	0/0 0/0 0/0
Nitrogen Dioxide (NO_2)[1]	0.18 ppm for 1 hour	0.100 ppm for 1 hour	2014 2015 2016	0.060 ppm 0.052 0.049	0/0 0/0 0/0
Fine Particulate Matter ($PM_{2.5}$)[3, 5]	No Separate Standard	35 $\mu g/m^3$ for 24 hours	2014 2015 2016	25.5 $\mu g/m^3$ 31.5 24.7	NA/NA NA/NA NA/NA
Particulate Matter (PM_{10})[3, 5, 6]	50 $\mu g/m^3$ for 24 hours	150 $\mu g/m^3$ for 24 hours	2014 2015 2016	40.0 $\mu g/m^3$ 48.0 NA	0/0 0/0 NA/0

Source: Aerometric Data Analysis and Measurement System (ADAM), summaries from 2014 to 2016, https://www.arb.ca.gov/adam.

ppm = parts per million; PM_{10} = particulate matter 10 microns in diameter or less; NM = not measured; $\mu g/m^3$ = micrograms per cubic meter; $PM_{2.5}$ = particulate matter 2.5 microns in diameter or less; NA = not applicable/data not available.

Notes:
1. Data collected from the Costa Mesa – Mesa Verde Drive Monitoring Station located at 2850 Mesa Verde Drive, Costa Mesa, California 92626.
2. Data collected from the Costa Mesa – Mesa Verde Drive Monitoring Station via CARB Air Quality and Meteorological Information System (AQ2MIS) Database: https://www.arb.ca.gov/aqmis2/aqmis2.php
3. Data collected from the Mission Viejo – 2601 Via Pera Monitoring Station located at 26081 Via Pera, Mission Viejo, CA 92691.
4. Maximum concentration is measured over the same period as the California Standards.
5. PM_{10} exceedances are based on State thresholds established prior to amendments adopted on June 20, 2002.
6. PM_{10} and $PM_{2.5}$ exceedances are derived from the number of samples exceeded, not days.
7. The Federal standard was revoked in June 2005.

City. Significant ozone formation generally requires an adequate amount of precursors in the atmosphere and several hours in a stable atmosphere with strong sunlight.

Many respiratory ailments, as well as cardiovascular disease, are aggravated by exposure to high ozone levels. Ozone also damages natural ecosystems (such as forests and foothill plant communities) and damages agricultural crops and some man-made materials (such as rubber, paint, and plastics). Societal costs from ozone damage include increased healthcare costs, the loss of human and animal life, accelerated replacement of industrial equipment and reduced crop yields.

Carbon Monoxide. Carbon monoxide (CO) is an odorless, colorless toxic gas that is emitted by mobile and stationary sources as a result of incomplete combustion of hydrocarbons or other carbon-based fuels. In cities, automobile exhaust can cause as much as 95 percent of all CO emissions. At high concentrations, CO can reduce the oxygen-carrying capacity of the blood and cause headaches, dizziness, and unconsciousness.

Nitrogen Dioxide. Nitrogen oxides (NO_X) are a family of highly reactive gases that are a primary precursor to the formation of ground-level O_3, and react in the atmosphere to form acid rain. NO_2 (often used interchangeably with NO_X) is a reddish-brown gas that can cause breathing difficulties at high levels. Peak readings of NO_2 occur in areas that have a high concentration of combustion sources (e.g., motor vehicle engines, power plants, refineries, and other industrial operations).

NO_2 can irritate and damage the lungs, and lower resistance to respiratory infections such as influenza. The health effects of short-term exposure are still unclear. However, continued or frequent exposure to NO_2 concentrations that are typically much higher than those normally found in the ambient air may increase acute respiratory illnesses in children and increase the incidence of chronic bronchitis and lung irritation. Chronic exposure to NO_2 may aggravate eyes and mucus membranes and cause pulmonary dysfunction.

Coarse Particulate Matter (PM_{10}). PM_{10} refers to suspended particulate matter, which is smaller than ten microns or ten one-millionths of a meter. PM_{10} arises from sources such as road dust, diesel soot, combustion products, construction operations, and dust storms. PM_{10} scatters light and significantly reduces visibility. In addition, these particulates penetrate the lungs and can potentially damage the respiratory tract. On June 19, 2003, CARB adopted amendments to the statewide 24-hour particulate matter standards based upon requirements set forth in the Children's Environmental Health Protection Act (SB 25).

Fine Particulate Matter ($PM_{2.5}$). Due to increased concerns over health impacts related to fine particulate matter (particulate matter 2.5 microns in diameter or less), both State and Federal $PM_{2.5}$ standards have been created. Particulate matter impacts primarily affect infants, children, the elderly, and those with pre-existing cardiopulmonary disease. In 1997, the EPA announced new $PM_{2.5}$ standards. Industry groups challenged the new standard in court and the implementation of the standard was blocked. However, upon appeal by the EPA, the U.S. Supreme Court reversed this decision and upheld the EPA's new standards.

On June 20, 2002, CARB adopted amendments for statewide annual ambient particulate matter air quality standards. These standards were revised/established due to increasing concerns by CARB that previous standards were inadequate, as almost everyone in California is exposed to levels at or above the current State standards during some parts of the year, and the statewide potential for significant health impacts associated with particulate matter exposure was determined to be large and wide-ranging.

Reactive Organic Gases and Volatile Organic Compounds. Hydrocarbons are organic gases that are formed solely of hydrogen and carbon. There are several subsets of organic gases including reactive organic gases (ROGs) and VOCs. Both ROGs and VOCs are emitted from the incomplete combustion of hydrocarbons or other carbon-based fuels. The major sources of hydrocarbons are combustion engine exhaust, oil refineries, and oil-fueled power plants; other common sources are petroleum fuels, solvents, dry cleaning solutions, and paint (via evaporation).

3.3 SENSITIVE RECEPTORS

Sensitive populations are more susceptible to the effects of air pollution than is the general population. Sensitive populations (sensitive receptors) that are in proximity to localized sources of toxics and CO are of particular concern. Land uses considered sensitive receptors include residences, schools, playgrounds, childcare centers, long-term health care facilities, rehabilitation centers, convalescent centers, and retirement homes. Table 3, *Sensitive Receptors*, lists the distances and locations of sensitive receptors within the project vicinity. The distances depicted in Table 3 are based on the distance from the project site to the outdoor activity area of the closest receptor.

Table 3
Sensitive Receptors

Type	Name	Distance from Project Site (feet)[1]	Direction from Project Site	Location
Residential	Residential Uses	575 feet	Southeast	South of East Peltason Drive
		765 feet	Northwest	East of East Peltason Drive
		2,550 feet	North	Near the Southwest corner of Pereira Drive
		1,480 feet	Northeast	North of East Peltason Drive and East of Engineering Service Road
Schools	University High School	6,550 feet	Northeast	4771 Campus Drive
	Tarbut V'Torah Community Day School	5,440 feet	Southwest	5200 Bonita Canyon Drive
	Montessori Schools of Irvine	2,115 feet	Southeast	101 Russel Place
	American Career College	3,500 feet	Northwest	151 Innovation Drive
	Irvine Chinese School	2,560 feet	Northeast	4255 Campus Drive
Places of Worship	Mariners Church	4,940 feet	Southeast	5001 Newport Coast Drive
	Temple Bat Yahm Campus	6,670 feet	West	1011 Camelback Street
	Bethel Korean Church	5,700 feet	Northeast	18700 Harvard Avenue
	St. Elizabeth Ann Seton	8,000 feet	East	9 Hillgate
	The Church of Jesus Christ Latter Day Saints	4,950 feet	Southwest	2150 Bonita Canyon Drive
Parks/Recreational Areas	William R Mason Regional Park	4,450 feet	Northeast	18712 University Drive
	Bonita Creek Park	5,530 feet	East	3010 La Vida
	Aldrich Park	600 feet	North	Near Inner Ring Road
	Mesa Court Field	3,750 feet	North	Corner of University Drive and Campus Drive
	Anteater Recreation Center	4,480 feet	East	East of California Avenue

Note:
1. Distances are measured from the exterior project boundary only and not from individual construction areas within the interior of the project site.

Source: Google Earth, 2017.

4.0 REGULATORY SETTING

4.1 FEDERAL

Air quality is federally protected by the Clean Air Act and its amendments. Under the Federal Clean Air Act (FCAA), the EPA developed the primary and secondary NAAQS for the criteria air pollutants including ozone, NO_2, CO, SO_2, PM_{10}, $PM_{2.5}$, and lead. Proposed projects in or near nonattainment areas could be subject to more stringent air-permitting requirements. The Clean Air Act requires each state to prepare a State Implementation Plan (SIP) to demonstrate how it will attain the NAAQS within the federally imposed deadlines.

The EPA can withhold certain transportation funds from states that fail to comply with the planning requirements of the Clean Air Act. If a state fails to correct these planning deficiencies within two years of Federal notification, the EPA is required to develop a Federal implementation plan for the identified nonattainment area or areas. The provisions of 40 CFR Parts 51 and 93 apply in all nonattainment and maintenance areas for transportation-related criteria pollutants for which the area is designated nonattainment or has a maintenance plan. The EPA has designated enforcement of air pollution control regulations to the individual states.

4.2 STATE

In 1988, the California Clean Air Act (CCAA) was adopted and led to the establishment of CAAQS for the same major pollutants as the NAAQS and standards for visibility reducing particles, sulfates, hydrogen sulfide, and vinyl chloride. There are currently no NAAQS for these latter pollutants. CARB is responsible for enforcing air pollution regulations in California. The CCAA requires all air pollution control districts in California to endeavor to achieve and maintain state ambient air-quality standards by the earliest practicable date and to develop plans and regulations specifying how they will meet this goal.

4.3 REGIONAL

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

The *2016 Air Quality Management Plan* (2016 AQMP), which was adopted in March 2017, proposes policies and measures to achieve federal and state standards for improved air quality in the South Coast Air Basin and those portions of the Salton Sea Air Basin (formerly named the Southeast Desert Air Basin) that are under the South Coast Air Quality Management District's (SCAQMD's) jurisdiction. The AQMP relies on a regional and multi-level partnership of governmental agencies at the federal, state, regional, and local level. These agencies (EPA, CARB, local governments, Southern California Association of Governments [SCAG], and the SCAQMD) are the primary agencies that implement the AQMP programs. The 2016 AQMP incorporates the latest scientific and technical information and planning assumptions, including the 2016-2040 Regional Transportation Plan/Sustainable Communities Strategy, updated emission inventory methodologies for various source categories, and SCAG's latest growth forecasts.

The 2016 AQMP addresses several state and federal planning requirements, incorporating new scientific information, primarily in the form of updated emissions inventories, ambient measurements, and new meteorological air quality models. The 2016 AQMP highlights the reductions and the interagency planning necessary to identify additional strategies, especially in the area of mobile sources, to meet all federal criteria pollutant standards within the timeframes allowed under Federal Clean Air Act. The primary task of the 2016 AQMP is to bring the Basin into attainment with federal health-based standards.

4.4 LOCAL

University of California, Irvine

Environmental Health and Safety Department

UCI's Environmental Health and Safety (EH&S) Department is responsible for implementing UCI’s Clean Air Program which assesses and facilitates UCI's compliance with air quality laws and regulations. In addition to the permitting programs required by California law and SCAQMD rules, UCI is required to implement a federal operating permit program, which meets federal EPA regulations adopted pursuant to Title V of the FCAA Amendments. Title V Program activities include assisting with SCAQMD Permit to Operate administration; monitoring, record keeping, and reporting activities; and developing regulatory programs and informational guidelines to ensure the campus remains in compliance with State and federal regulations.

Several different departments at UCI are involved with this program. Academic department chairs and directors are responsible for reporting new air emission sources to EH&S and maintaining records. Facilities Management and Design and Construction Services provide building and renovation plans to EH&S for review and also report new air emission sources to EH&S. Parking and Transportation Services, while not directly involved with the Clean Air Program, reduce air emissions by implementing the Alternative Transportation Program to reduce vehicular traffic and associated emissions.

5.0 POTENTIAL AIR QUALITY IMPACTS

CEQA THRESHOLDS

The environmental analysis in this section is patterned after the Initial Study Checklist recommended by the State *CEQA Guidelines*, as amended. The issues presented in the Initial Study Checklist have been utilized as thresholds of significance in this section. Accordingly, a project may create a significant environmental impact if it causes one or more of the following to occur:

- Conflict with or obstruct implementation of the applicable air quality plan (refer to Impact Statement AQ-1);
- Violate any air quality standard or contribute substantially to an existing or projected air quality violation (refer to Impact Statement AQ-2);
- Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in nonattainment under an applicable Federal or State ambient air quality standard (including releasing emissions that exceed quantitative thresholds for O_3 precursors) (refer to Impact Statement AQ-3);
- Expose sensitive receptors to substantial pollutant concentrations (refer to Impact Statement AQ-4);
- Create objectionable odors affecting a substantial number of people (refer to Impact Statement AQ-5);

Based on these standards and thresholds, the effects of the proposed project have been categorized as either a "less than significant impact" or a "potentially significant impact." Mitigation measures are recommended for potentially significant impacts.

AIR QUALITY THRESHOLDS

Under CEQA, the SCAQMD is an expert commenting agency on air quality within its jurisdiction or impacting its jurisdiction. Under the FCAA, the SCAQMD has adopted Federal attainment plans for O_3 and $PM_{2.5}$. The SCAQMD reviews projects to ensure that they would not: (1) cause or contribute to any new violation of any air quality standard; (2) increase the frequency or severity of any existing violation of any air quality standard; or (3) delay timely attainment of any air quality standard or any required interim emission reductions or other milestones of any Federal attainment plan.

The *CEQA Air Quality Handbook* also provides significance thresholds for both construction and operation of projects within the SCAQMD jurisdictional boundaries. If the SCAQMD thresholds are exceeded, a potentially significant impact could result. However, ultimately the lead agency determines the thresholds of significance for impacts. If a project proposes development in excess of the established thresholds, as outlined in Table 4, *South Coast Air Quality Management District Emissions Thresholds*, a significant air quality impact may occur and additional analysis is warranted to fully assess the significance of impacts.

Table 4
South Coast Air Quality Management District Emissions Thresholds

Phase	Pollutant (lbs/day)					
	ROG	NO_X	CO	SO_X	PM_{10}	$PM_{2.5}$
Construction	75	100	550	150	150	55
Operational	55	55	550	150	150	55
Source: South Coast Air Quality Management District, CEQA Air Quality Handbook, November 1993.						

Local Carbon Monoxide Standards

The significance of localized project impacts depends on whether ambient CO levels in the vicinity of the project are above or below State and Federal CO standards, as follows:

- If the project causes an exceedance of either the State one-hour or eight-hour CO concentrations, the project would be considered to have a significant local impact.

- If ambient levels already exceed a State or Federal standard, then project emissions would be considered significant if they increase one-hour CO concentrations by 1.0 ppm or more, or eight-hour CO concentrations by 0.45 ppm or more.

Localized Significance Thresholds

Localized Significance Thresholds (LSTs) were developed in response to SCAQMD Governing Boards' Environmental Justice Enhancement Initiative (I-4). The SCAQMD provided the *Final Localized Significance Threshold Methodology* (dated July 2008) for guidance. The LST methodology assists lead agencies in analyzing localized impacts associated with project-specific level proposed projects. The SCAQMD provides the LST lookup tables for one-, two-, and five-acre projects emitting CO, NO_X, or PM_{10}. The LST methodology and associated mass rates are not designed to evaluate localized impacts from mobile sources traveling over the roadways. The SCAQMD recommends that any project over five acres should perform air quality dispersion modeling to assess impacts to nearby sensitive receptors.

Cumulative Emissions Thresholds

The SCAQMD's 2016 AQMP was prepared to accommodate growth, meet State and Federal air quality standards, and minimize the fiscal impact that pollution control measures have on the local economy. According to the SCAQMD *CEQA Air Quality Handbook*, project-related emissions that fall below the established construction and operational thresholds should be considered less than significant unless there is pertinent information to the contrary. If a project exceeds these emission thresholds, the SCAQMD *CEQA Air Quality Handbook* states that the significance of a project's contribution to cumulative impacts should be determined based on whether the rate of growth in average daily trips exceeds the rate of growth in population.

AQ-1 CONFLICT WITH OR OBSTRUCT IMPLEMENTATION OF THE APPLICABLE AIR QUALITY PLAN?

Level of Significance Before Mitigation: *Potentially Significant Impact.*

On March 3, 2017, the SCAQMD Governing Board approved the 2016 AQMP, which outlines its strategies for meeting the NAAQS for $PM_{2.5}$ and ozone. According to the SCAQMD CEQA Air Quality Handbook, in order to determine consistency with the AQMP, two main criteria must be addressed.

Criterion 1:

With respect to the first criterion, SCAQMD methodologies require that an air quality analysis for a project include forecasts of project emissions in relation to contributing to air quality violations and delay of attainment.

a) *Would the project result in an increase in the frequency or severity of existing air quality violations?*

   Since the consistency criteria identified under the first criterion pertain to pollutant concentrations, rather than to total regional emissions, an analysis of a project's pollutant emissions relative to localized pollutant concentrations is used as the basis for evaluating project consistency. As discussed in Impact Statement AQ-4, below, localized concentrations of CO, NO_X, PM_{10}, and $PM_{2.5}$ would be less than significant during project operations. Therefore, the proposed project would not result in an increase in the frequency or severity of existing air quality violations. Because reactive organic gases (ROGs) are not a criteria pollutant, there is no ambient standard or localized threshold for ROGs. Due to the role ROG plays in ozone formation, it is classified as a precursor pollutant and only a regional emissions threshold has been established.

b) *Would the project cause or contribute to new air quality violations?*

   As discussed in Impact Statement AQ-2, operations of the proposed project would result in emissions that would be below the SCAQMD operational thresholds. Therefore, the proposed project would not have the potential to cause or affect a violation of the ambient air quality standards.

c) *Would the project delay timely attainment of air quality standards or the interim emissions reductions specified in the AQMP?*

The proposed project would result in less than significant impacts with regard to localized concentrations during project operations. As such, the proposed project would not delay the timely attainment of air quality standards or 2016 AQMP emissions reductions.

Criterion 2:

With respect to the second criterion for determining consistency with SCAQMD and SCAG air quality policies, it is important to recognize that air quality planning within the Basin focuses on attainment of ambient air quality standards at the earliest feasible date. Projections for achieving air quality goals are based on assumptions regarding population, housing, and growth trends. Thus, the SCAQMD's second criterion for determining project consistency focuses on whether or not the proposed project exceeds the assumptions utilized in preparing the forecasts presented in the 2016 AQMP. Determining whether or not a project exceeds the assumptions reflected in the 2016 AQMP involves the evaluation of the three criteria outlined below. The following discussion provides an analysis of each of these criteria.

a) *Would the project be consistent with the population, housing, and employment growth projections utilized in the preparation of the AQMP?*

In the case of the 2016 AQMP, several sources of data form the basis for the projections of air pollutant emissions including: the *City of Irvine General Plan* (General Plan), UCI's *2007 Long Range Development Plan* (LRDP), SCAG's *Growth Management* Chapter of the *Regional Comprehensive Plan* (RCP), and SCAG's *2016-2040 Regional Transportation Plan/Sustainable Communities Strategy* (RTP/SCS). The RTP/SCS also provides socioeconomic forecast projections of regional population growth. The General Plan Land Use Map designates the project site as "Educational Facilities", and the LRDP designates the site as Mixed Use - Commercial. According to the LRDP, the Academic and Support designation includes classrooms, instructional and research laboratories, undergraduate, graduate, and professional schools and programs, and additional support facilities such as administrative facilities, libraries, performance and cultural facilities, conference facilities, and services supporting academic operations. Other permitted uses in this category include food service, recreation, parking, utility infrastructure, and other support uses. The project proposes to construct an Interdisciplinary Science Building ranging from one to seven stories and totaling up to 200,000 GSF. The project would provide a research facility for UCI faculty, student researchers and staff (adding a max of 70 faculty), and therefore complies with the site's intended use. Additionally, the project would be consistent with the City's General Plan and UCI's LRDP and assumed emissions for the project site, since no change in the site's land use designation is proposed. Thus, the project is generally consistent with the types, intensity, and patterns of land use envisioned for the site vicinity in the RCP. The population, housing, and employment forecasts, which are adopted by SCAG's Regional Council, are based on the local plans and policies applicable to the cities; these are used by SCAG in all phases of implementation and review. Additionally, as SCAQMD incorporated these same projections into the 2016 AQMP, it can be concluded that the project would be consistent with the projections. As a result, the project would not exceed growth assumptions within the City's General Plan and UCI's LRDP. Therefore, the project would be consistent with the 2016 AQMP and a less than significant impact would occur.

b) *Would the project implement all feasible air quality mitigation measures?*

Compliance with all feasible emission reduction measures identified by the SCAQMD would be required as identified in Impact Statement AQ-2 and AQ-3. As such, the proposed project would meet this AQMP consistency criterion.

c) *Would the project be consistent with the land use planning strategies set forth in the AQMP?*

The project is consistent with the LRDP land use designations for the site, and would serve to implement various LRDP policies. Compliance with emission reduction measures identified by the SCAQMD would be required as identified in Impact Statement AQ-2 and Impact Statement AQ-3. As such, the proposed project meets this AQMP consistency criterion.

In conclusion, the determination of 2016 AQMP consistency is primarily concerned with the long-term influence of a project on air quality in the Basin. The proposed project would not result in a long-term impact on the region's ability to meet State and Federal air quality standards. Also, the proposed project would be consistent with the goals and policies of the AQMP for control of fugitive dust. As discussed above, the proposed project's long-term influence would also be consistent with the SCAQMD and SCAG's goals and policies and is, therefore, considered consistent with the 2016 AQMP.

Mitigation Measures: Refer to Mitigation Measures AQ-1, below.

Level of Significance After Mitigation. *Less Than Significant Impact.*

AQ-2 VIOLATE ANY AIR QUALITY STANDARDS OR CONTRIBUTE SUBSTANTIALLY TO AN EXISTING OR PROJECTED AIR QUALITY VIOLATION?

Level of Significance Before Mitigation: *Potentially Significant Impact.*

SHORT-TERM CONSTRUCTION

Short-term air quality impacts are predicted to occur during grading and construction operations associated with implementation of the proposed project. Temporary air emissions would result from the following activities:

- Particulate (fugitive dust) emissions from grading and building construction; and

- Exhaust emissions from the construction equipment and the motor vehicles of the construction crew.

Construction is expected to begin in April 2018 and last for a duration of 24 months. The project proposes to demolish a 160,000 GSF surface parking lot to develop a 200,000 GSF Interdisciplinary Science Building. Construction would involve activities associated with demolition of the paved area, grading, paving, building construction, and architectural coating. Site grading would require approximately 14,815 cubic yards of soil export off-site. Project construction equipment would include graders, dozers, and tractors/loaders/backhoes during grading; generator sets, rough terrain forklifts, cranes, tractors/loaders/backhoes, and welders during building construction; cement and mortar mixers, pavers, paving equipment, and rollers during paving; and air compressors during architectural coating. Emissions for each construction phase have been quantified based upon the phase durations and equipment types. The analysis of daily construction emissions has been prepared utilizing the California Emissions Estimator Model (CalEEMod) version 2016.3.1. Refer to Appendix A, *Air Quality Emissions Data*, for the CalEEMod outputs and results. Table 5, *Short-Term (Construction) Emissions*, presents the anticipated daily short-term construction emissions.

Table 5
Short-Term (Construction) Emissions

Emissions Source	Pollutant (pounds/day) [1, 2]					
	ROG[3]	NO_X	CO	SO_2	PM_{10}	$PM_{2.5}$
2018						
Unmitigated Emissions	3.16	43.18	20.06	0.07	15.53	3.68
Mitigated Emissions	3.16	43.18	20.06	0.07	8.12	2.55
SCAQMD Thresholds	75	100	550	150	150	55
Is Threshold Exceeded After Mitigation?	*No*	*No*	*No*	*No*	*No*	*No*
2019						
Unmitigated Emissions	12.55	21.86	19.75	0.04	2.42	1.41
Mitigated Emissions	15.55	21.86	19.75	0.04	2.35	1.39
SCAQMD Thresholds	75	100	550	150	150	55
Is Threshold Exceeded After Mitigation?	*No*	*No*	*No*	*No*	*No*	*No*
2020						
Unmitigated Emissions	12.23	20.18	19.07	0.04	2.27	1.26
Mitigated Emissions	12.23	20.18	19.07	0.04	2.20	1.25
SCAQMD Thresholds	75	100	550	150	150	55
Is Threshold Exceeded After Mitigation?	*No*	*No*	*No*	*No*	*No*	*No*

Notes:
1. Emissions were calculated using CalEEMod, as recommended by the SCAQMD.
2. The reduction/credits for construction emission mitigations are based on mitigation included in CalEEMod and as typically required by the SCAQMD. The mitigation includes the following: properly maintain mobile and other construction equipment; replace ground cover in disturbed areas quickly; water exposed surfaces three times daily; cover stock piles with tarps; water all haul roads twice daily; and limit speeds on unpaved roads to 15 miles per hour.
3. Both ROGs and VOCs are subsets of organic gases that are emitted from the incomplete combustion of hydrocarbons or other carbon-based fuels. Although they represent slightly different subsets of organic gases, they are used interchangeably for the purposes of this analysis.

Refer to Appendix A, *Air Quality Emissions Data*, for assumptions used in this analysis.

Fugitive Dust Emissions

Construction activities are a source of fugitive dust (PM_{10} and $PM_{2.5}$) emissions that may have a substantial, temporary impact on local air quality. In addition, fugitive dust may be a nuisance to those living and working in the project area. Fugitive dust emissions are associated with land clearing, ground excavation, cut-and-fill, and truck travel on unpaved roadways (including demolition as well as construction activities). Fugitive dust emissions vary substantially from day to day, depending on the level of activity, specific operations, and weather conditions. Fugitive dust from grading and construction is expected to be short-term and would cease upon project completion. Additionally, most of this material is inert silicates, rather than the complex organic particulates released from combustion sources, which are more harmful to health.

Dust (larger than 10 microns) generated by such activities usually becomes more of a local nuisance than a serious health problem. Of particular health concern is the amount of PM_{10} (particulate matter smaller than 10 microns) generated as a part of fugitive dust emissions. PM_{10} poses a serious health hazard alone or in combination with other pollutants. Fine Particulate Matter ($PM_{2.5}$) is mostly produced by mechanical processes. These include automobile tire wear, industrial processes such as cutting and grinding, and re-suspension of particles from the ground or road surfaces by wind and human activities such as construction or agriculture. $PM_{2.5}$ is mostly derived from combustion sources, such as automobiles, trucks, and other vehicle exhaust, as well as from stationary sources. These particles are either directly emitted or are formed in the atmosphere from the combustion of gases such as NO_X and SO_X combining with ammonia. $PM_{2.5}$ components from material in the earth's crust, such as dust, are also present, with the amount varying in different locations.

Mitigation Measure AQ-1 would require the project contractor to implement construction emissions Best Management Practices (BMPs) during construction, including, but not limited to, dust control techniques (i.e., daily watering), a traffic management plan, and adherence to SCAQMD Rules 402 and 403 (which require watering of inactive and perimeter areas, track out requirements, etc.), to reduce PM_{10} and $PM_{2.5}$ concentrations. It is noted that the BMPs required in Mitigation Measure AQ-1 are applicable measures from LRDP EIR Mitigation Measure Air-2B. These are standard dust control measures that the SCAQMD requires for all projects. As indicated in Table 5, total PM_{10} and $PM_{2.5}$ emissions would be below the SCAQMD threshold with the implementation of Mitigation Measure AQ-1. Therefore, particulate matter impacts during construction would be less than significant.

ROG Emissions[2]

In addition to gaseous and particulate emissions, the application of asphalt and surface coatings creates ROG emissions, which are O_3 precursors. In accordance with the methodology prescribed by the SCAQMD, the ROG emissions associated with paving have been quantified with

[2] ROGs and VOCs are subsets of organic gases that are emitted from the incomplete combustion of hydrocarbons or other carbon-based fuels. Although they represent slightly different subsets of organic gases, they are used interchangeably for the purposes of this analysis.

CalEEMod. Architectural coatings were also quantified with CalEEMod based upon the size of the buildings.

The highest concentration of ROG emissions would be generated during the application of architectural coatings on the building. As required by law, all architectural coatings for the proposed project structures would comply with SCAQMD Regulation XI, Rule 1113 – Architectural Coating.[3] Rule 1113 provides specifications on painting practices as well as regulates the ROG content of paint. As shown in Table 5, project construction would not result in an exceedance of ROG emissions during any years of construction. Therefore, impacts would be less than significant in this regard.

Construction Equipment and Worker Vehicle Exhaust

Exhaust emissions from construction activities include emissions associated with the transport of machinery and supplies to and from the project site, emissions produced on-site as the equipment is used, and emissions from trucks transporting materials to and from the site. Standard SCAQMD regulations, such as maintaining all construction equipment in proper tune, shutting down equipment when not in use for extended periods of time, and implementing SCAQMD Rule 403 would be adhered to. As noted in Table 5, construction equipment exhaust would not exceed SCAQMD thresholds. Therefore, impacts are less than significant in this regard.

Naturally Occurring Asbestos

Asbestos is a term used for several types of naturally occurring fibrous minerals that are a human health hazard when airborne. The most common type of asbestos is chrysotile, but other types such as tremolite and actinolite are also found in California. Asbestos is classified as a known human carcinogen by State, Federal, and international agencies and was identified as a toxic air contaminant by the California Air Resources Board in 1986.

Asbestos can be released from serpentinite and ultramafic rocks when the rock is broken or crushed. At the point of release, the asbestos fibers may become airborne, causing air quality and human health hazards. These rocks have been commonly used for unpaved gravel roads, landscaping, fill projects, and other improvement projects in some localities. Asbestos may be released to the atmosphere due to vehicular traffic on unpaved roads, during grading for development projects, and at quarry operations. All of these activities may have the effect of releasing potentially harmful asbestos into the air. Natural weathering and erosion processes can act on asbestos bearing rock and make it easier for asbestos fibers to become airborne if such rock is disturbed. According to the Department of Conservation Division of Mines and Geology, *A General Location Guide for Ultramafic Rocks in California – Areas More Likely to Contain Naturally Occurring Asbestos Report* (August 2000), serpentinite and ultramafic rocks are not known to occur within the project area. Thus, there would be no impact in this regard.

[3] South Coast Air Quality Management District, *Regulation XI Source Specific Standards,* http://www.aqmd.gov/docs/default-source/rule-book/reg-xi/r1113.pdf?sfvrsn=15, accessed on March 8, 2017.

Construction Odors

Potential odors could arise from the diesel construction equipment used on-site, as well as from architectural coatings and asphalt off-gassing. Odors generated from the referenced sources are common in the man-made environment and are not known to be substantially offensive to adjacent receptors. Additionally, odors generated during construction activities would be temporary and would decrease rapidly. Therefore, construction odors are not considered to be a significant impact.

Total Daily Construction Emissions

In accordance with the SCAQMD Guidelines, CalEEMod was utilized to model construction emissions for ROG, NO_X, CO, SO_X, PM_{10}, and $PM_{2.5}$. Construction of the Interdisciplinary Science Building would start in early 2018 and be completed in 24 months. The greatest emissions would be generated during the initial stages of construction. Additionally, the greatest amount of ROG emissions would typically occur during the final stages of development due to the application of architectural coatings.

CalEEMod allows the user to input mitigation measures such as watering the construction area to limit fugitive dust. Mitigation measures that were input into CalEEMod allow for certain reduction credits and result in a decrease of pollutant emissions. Reduction credits are based upon studies developed by CARB, SCAQMD, and other air quality management districts throughout California, and were programmed within CalEEMod. As indicated in Table 5, CalEEMod calculates the reduction associated with recommended mitigation measures. As depicted in Table 5, construction emissions would be less than significant with implementation of Mitigation Measure AQ-1. Thus, construction related air emissions would be less than significant.

LONG-TERM OPERATIONAL EMISSIONS

Mobile Source Emissions

Mobile sources are emissions from motor vehicles, including tailpipe and evaporative emissions. Depending upon the pollutant being discussed, the potential air quality impact may be of either regional or local concern. For example, ROG, NO_X, SO_X, PM_{10}, and $PM_{2.5}$ are all pollutants of regional concern (NO_X and ROG react with sunlight to form O_3 [photochemical smog], and wind currents readily transport SO_X, PM_{10}, and $PM_{2.5}$). However, CO tends to be a localized pollutant, dispersing rapidly at the source.

Project-generated vehicle emissions have been estimated using CalEEMod. Trip generation rates associated with the project were based on traffic data within the *UCI Interdisciplinary Sciences Building Traffic Study* (Traffic Study) for the proposed project, prepared by Stantec Consulting Services (dated July 2017). The proposed project would result in approximately 113 new daily trips from the addition of up to 70 new faculty members.[4] Table 6, *Long-Term Air Emissions*, presents the anticipated mobile source emissions. As shown in Table 6, mitigated emissions generated by vehicle traffic associated with the proposed project would not exceed established SCAQMD regional thresholds.

Table 6
Long-Term Air Emissions

Source	Estimated Emissions (pounds/day) [1]					
	ROG	NO_X	CO	SO_X	PM_{10}	$PM_{2.5}$
Area Sources	4.47	0.00	0.02	0.00	0.00	0.00
Energy Sources	0.08	0.72	0.60	0.00	0.05	0.05
Mobile Sources	0.31	1.29	3.89	0.01	1.24	0.34
Total Emissions	4.86	2.01	4.51	0.01	1.29	0.39
SCAQMD Threshold	*55*	*55*	*550*	*150*	*150*	*55*
Is Threshold Exceeded? (Significant Impact)	No	No	No	No	No	No
Notes: 1. Based on CalEEMod modeling results, mitigated seasonal emissions for area and mobile emissions have been modeled.						
Source: Refer to Appendix A, *Air Quality Emissions Data*, for assumptions used in this analysis.						

Area Source Emissions

Area source emissions would be generated due to an increased demand for consumer products, architectural coating, and landscaping. As shown in Table 6, area source emissions from the proposed project would not exceed SCAQMD thresholds for ROG, NO_X, CO, SO_X, PM_{10}, or $PM_{2.5}$.

Energy Source Emissions

Energy source emissions would be generated as a result of electricity and natural gas (non-hearth) usage associated with the proposed project. The primary use of electricity and natural gas by the project would be for space heating and cooling, water heating, ventilation, lighting, appliances, and electronics. As shown in Table 6, energy source emissions from the proposed project would not exceed SCAQMD thresholds for ROG, NO_X, CO, SO_X, PM_{10}, or $PM_{2.5}$.

Conclusion

As indicated in Table 6, operational emissions from the proposed project would not exceed SCAQMD thresholds. If stationary sources, such as backup generators, are installed on-site, they would be required to obtain the applicable permits from SCAQMD for operation of such equipment. The SCAQMD is responsible for issuing permits for the operation of stationary sources in order to reduce air pollution, and to attain and maintain the national and California

[4] It should be noted that the Final Traffic Study identifies 113 new daily trips associated with the project. However, modeling in this report is conservatively based on 193 new daily trips identified in an earlier draft of the Traffic Study.

ambient air quality standards in the Basin. Backup generators would be used only in emergency situations, and would not contribute a substantial amount of emissions capable of exceeding SCAQMD thresholds. Thus, operational air quality impacts would be less than significant.

Mitigation Measures:

AQ-1 Prior to initiating construction, UCI shall ensure that the project construction contract includes a construction emissions mitigation plan, including measures compliant with SCAQMD Rule 403 (Fugitive Dust), to be implemented and supervised by the on-site construction supervisor, which shall include, but not be limited to, the following BMPs:

i. During grading and site preparation activities, exposed soil areas shall be stabilized via frequent watering, non-toxic chemical stabilization, or equivalent measures at a rate to be determined by the on-site construction supervisor.

ii. During windy days when fugitive dust can be observed leaving the construction site, additional applications of water shall be required at a rate to be determined by the onsite construction supervisor.

iii. Disturbed areas designated for landscaping shall be prepared as soon as possible after completion of construction activities.

iv. Areas of the construction site that will remain inactive for three months or longer following clearing, grubbing and/or grading shall receive appropriate BMP treatments (e.g., revegetation, mulching, covering with tarps, etc.) to prevent fugitive dust generation.

v. All exposed soil or material stockpiles that will not be used within 3 days shall be enclosed, covered, or watered twice daily, or shall be stabilized with approved nontoxic chemical soil binders at a rate to be determined by the on-site construction supervisor.

vi. Unpaved access roads shall be stabilized via frequent watering, non-toxic chemical stabilization, temporary paving, or equivalent measures at a rate to be determined by the on-site construction supervisor.

vii. Trucks transporting materials to and from the site shall allow for at least two feet of freeboard (i.e., minimum vertical distance between the top of the load and the top of the trailer). Alternatively, trucks transporting materials shall be covered.

viii. Speed limit signs at 15 mph or less shall be installed on all unpaved roads within construction sites.

ix. Where visible soil material is tracked onto adjacent public paved roads, the paved roads shall be swept and debris shall be returned to the construction site or transported off site for disposal.

x. Wheel washers, dirt knock-off grates/mats, or equivalent measures shall be installed within the construction site where vehicles exit unpaved roads onto paved roads.

xi. Diesel powered construction equipment shall be maintained in accordance with manufacturer's requirements, and shall be retrofitted with diesel particulate filters where available and practicable.

xii. Heavy duty diesel trucks and gasoline powered equipment shall be turned off if idling is anticipated to last for more than 5 minutes.

xiii. Where feasible, the construction contractor shall use alternatively fueled construction equipment, such as electric or natural gas-powered equipment or biofuel.

xiv. Heavy construction equipment shall use low NOx diesel fuel to the extent that it is readily available at the time of construction.

xv. To the extent feasible, construction activities shall rely on the campus's existing electricity infrastructure rather than electrical generators powered by internal combustion engines.

xvi. The construction contractor shall develop a construction traffic management plan that includes the following:

- Scheduling heavy-duty truck deliveries to avoid peak traffic periods Consolidating truck deliveries.

xvii. Where possible, the construction contractor shall provide a lunch shuttle or on-site lunch service for construction workers.

xviii. The construction contractor shall, to the extent possible, use pre-coated architectural materials that do not require painting. Water-based or low VOC coatings shall be used that are compliant with SCAQMD Rule 1113. Spray equipment with high transfer efficiency, such as the high volume-low pressure spray method, or manual coatings application shall be used to reduce VOC emissions to the extent possible.

xix. Project constructions plans and specifications will include a requirement to define and implement a work program that would limit the emissions of reactive organic gases (ROG's) during the application of architectural coatings to the extent necessary to keep total daily ROG's for each project to below 75 pounds per day, or the current SCAQMD threshold, throughout that period of construction activity to the extent feasible. The specific program may include any combination of restrictions on the types of paints and coatings, application methods, and the amount of surface area coated as determined by the contractor.

xx. The construction contractor shall maintain signage along the construction perimeter with the name and telephone number of the individual in charge of implementing the construction emissions mitigation plan, and with the telephone number of the SCAQMD's complaint line. The contractor's representative shall maintain a log of any public complaints and corrective actions taken to resolve complaints.

(Mitigation Measure AQ-1 correlates with Mitigation Measure Air-2B in the 2007 LRDP EIR).

Level of Significance After Mitigation. *Less than Significant Impact.*

AQ-3 RESULT IN A CUMULATIVELY CONSIDERABLE NET INCREASE OF ANY CRITERIA POLLUTANT FOR WHICH THE REGION IS NONATTAINMENT FOR FEDERAL OR STATE STANDARDS?

Level of Significance Before Mitigation: *Potentially Significant Impact.*

With respect to the proposed project's construction-related air quality emissions and cumulative Basin-wide conditions, the SCAQMD has developed strategies to reduce criteria pollutant emissions outlined in the 2016 AQMP pursuant to Federal Clean Air Act mandates. As such, the proposed project would comply with SCAQMD Rule 403 requirements, and implement all feasible mitigation measures (Mitigation Measure AQ-1). Rule 403 requires that fugitive dust be controlled with the best available control measures in order to reduce dust so that it does not remain visible in the atmosphere beyond the property line of the proposed project. In addition, the proposed project would comply with adopted 2016 AQMP emissions control measures. Per SCAQMD rules and mandates, as well as the CEQA requirement that significant impacts be mitigated to the extent feasible, these same requirements (i.e., Rule 403 compliance, the implementation of all feasible mitigation measures, and compliance with adopted AQMP emissions control measures) would also be imposed on construction projects throughout the Basin, which would include related projects.

As discussed previously, the proposed project would not result in long-term air quality impacts, as emissions would not exceed the SCAQMD adopted operational thresholds. Additionally, adherence to SCAQMD rules and regulations would alleviate potential impacts related to cumulative conditions on a project-by-project basis. Emission reduction technology, strategies, and plans are constantly being developed. As a result, the proposed project would not contribute a cumulatively considerable net increase of any nonattainment criteria pollutant. Therefore, cumulative operational impacts associated with implementation of the proposed project would be less than significant.

Mitigation Measures: Refer to Mitigation Measure AQ-1.

Level of Significance After Mitigation. *Less Than Significant Impact.*

AQ-4 EXPOSE SENSITIVE RECEPTORS TO SUBSTANTIAL POLLUTANT CONCENTRATIONS?

Level of Significance Before Mitigation: *Potentially Significant Impact.*

Sensitive receptors are defined as facilities or land uses that include members of the population that are particularly sensitive to the effects of air pollutants, such as children, the elderly, and people with illnesses. Examples of these sensitive receptors are residences, schools, hospitals, and daycare centers. CARB has identified the following groups of individuals as the most likely to be affected by air pollution: the elderly over 65, children under 14, athletes, and persons with cardiovascular and chronic respiratory diseases such as asthma, emphysema, and bronchitis. On-campus sensitive receptors near the project site include surrounding residences adjacent to the north, east, and south of the project site. In order to identify impacts to sensitive receptors, the SCAQMD recommends addressing localized significance thresholds (LSTs) for construction and operations impacts (area sources only). The CO hotspot analysis following the LST analysis addresses localized mobile source impacts.

LOCALIZED SIGNIFICANCE THRESHOLDS (LST)

LSTs were developed in response to SCAQMD Governing Boards' Environmental Justice Enhancement Initiative (I-4). The SCAQMD provided the *Final Localized Significance Threshold Methodology* (dated June 2003 [revised 2008]) for guidance. The LST methodology assists lead agencies in analyzing localized air quality impacts. The SCAQMD provides the LST screening lookup tables for one, two, and five acre projects emitting CO, NO_X, $PM_{2.5}$, or PM_{10}. The LST methodology and associated mass rates are not designed to evaluate localized impacts from mobile sources traveling over the roadways. The SCAQMD recommends that any project over five acres should perform air quality dispersion modeling to assess impacts to nearby sensitive receptors. The project is located within Source Receptor Area (SRA) 20, Central Orange County Coastal.

Construction

The SCAQMD guidance on applying CalEEMod to LSTs specifies the amount of acres a particular piece of equipment would likely disturb per day. Based on the SCAQMD guidance on applying CalEEMod to LSTs, the project would disturb at most four acres of land per day. However, the

SCAQMD provides thresholds for one, two, and five acre sites. Therefore, the LST thresholds for one acre was conservatively utilized for the construction LST analysis. The closest sensitive receptors to the project site are residential uses that are within 100 meters of the project site to the north, east, and south. These sensitive land uses may be potentially affected by air pollutant emissions generated during on-site construction activities. LST thresholds are provided for distances to sensitive receptors of 25, 50, 100, 200, and 500 meters. As the nearest sensitive uses are within 100 meters of the project site, the LST values for 100 meters were used. Table 7, *Localized Significance of Construction Emissions*, shows the localized unmitigated and mitigated construction-related emissions. It is noted that the localized emissions presented in Table 7 are less than those in Table 5 because localized emissions include only on-site emissions (i.e., from construction equipment and fugitive dust), and do not include off-site emissions (i.e., from hauling activities). As seen in Table 7, mitigated on-site emissions would not exceed the LSTs for SRA 20.

Operations

For project operations, the one acre threshold was conservatively utilized, as the project site is approximately 0.75 acres. As the nearest sensitive uses are within 100 meters of the project site, the LST values for 100 meters were used. As seen in Table 8, *Localized Significance of Operational Emissions*, project-related mitigated operational area source emissions would be negligible and would be below the LSTs. As such, operational LST impacts would be less than significant in this regard.

Table 7
Localized Significance of Construction Emissions

Source	Pollutant (pounds/day)[1]			
	NO_X	CO	PM_{10}	$PM_{2.5}$
2018				
Total Unmitigated On-Site Emissions[2]	24.36	15.11	14.28	3.29
Total Mitigated On-Site Emissions[2]	24.36	15.11	6.93	2.17
Localized Significance Threshold[1]	108	1,090	27	9
Thresholds Exceeded?	*No*	*No*	*No*	*No*
2019				
Total Unmitigated On-Site Emissions[3]	15.98	13.49	0.92	0.88
Total Mitigated On-Site Emissions[3]	15.98	13.49	0.92	0.88
Localized Significance Threshold[1]	108	1,090	27	9
Thresholds Exceeded?	*No*	*No*	*No*	*No*
2020				
Total Unmitigated On-Site Emissions[3]	14.79	13.19	0.80	0.77
Total Mitigated On-Site Emissions[3]	14.79	13.19	0.80	0.77
Localized Significance Threshold[1]	108	1,090	27	9
Thresholds Exceeded?	*No*	*No*	*No*	*No*

Notes:
1. The Localized Significance Threshold was determined using Appendix C of the SCAQMD Final Localized Significant Threshold Methodology guidance document for pollutants NO_X, CO, PM_{10}, and $PM_{2.5}$. The Localized Significance Threshold was based on the anticipated daily acreage disturbance for construction, the distance to sensitive receptors, and the source receptor area (SRA 20).
2. The Demolition Phase represents the worst case scenario for NO_X, CO, PM_{10}, and $PM_{2.5}$.
3. The Building Construction Phase represents the worst case scenario for NO_X, CO, PM_{10}, and $PM_{2.5}$.

Table 8
Localized Significance of Operational Emissions

Source	Pollutant (pounds/day)			
	NO_X	CO	PM_{10}	$PM_{2.5}$
Total Unmitigated Area Source Emissions	0.00	0.02	0.00	0.00
Localized Significance Threshold[1]	*108*	*1,090*	*27*	*9*
Thresholds Exceeded?	*No*	*No*	*No*	*No*

Note:
1. The Localized Significance Threshold was determined using Appendix C of the SCAQMD Final Localized Significant Threshold Methodology guidance document for pollutants NO_X, CO, PM_{10}, and $PM_{2.5}$. The Localized Significance Threshold was based on the total acreage, the distance to sensitive receptors, and the source receptor area (SRA 20).

CARBON MONOXIDE HOTSPOTS

Intersection Hotspots

CO emissions are a function of vehicle idling time, meteorological conditions, and traffic flow. Under certain extreme meteorological conditions, CO concentrations near a congested roadway or intersection may reach unhealthful levels (i.e., adversely affecting residents, school children, hospital patients, the elderly, etc.).

The SCAQMD requires a quantified assessment of CO hotspots when a project increases the volume-to-capacity ratio (also called the intersection capacity utilization) by 0.02 (two percent) for any intersection with an existing level of service LOS D or worse. Because traffic congestion is highest at intersections where vehicles queue and are subject to reduced speeds, these hot spots are typically produced at intersections.

The project is located in the South Coast Air Basin (Basin), which is designated as an attainment/maintenance area for the Federal CO standards and an attainment area for State standards. There has been a decline in CO emissions even though vehicle miles traveled on U.S. urban and rural roads have increased. On-road mobile source CO emissions have declined 24 percent between 1989 and 1998, despite a 23 percent rise in motor vehicle miles traveled over the same 10 years. California trends have been consistent with national trends; CO emissions declined 20 percent in California from 1985 through 1997 while vehicle miles traveled increased 18 percent in the 1990s. CO emissions have continued to decline since this time. The Basin was re-designated as attainment in 2007, and is no longer addressed in the SCAQMD's AQMP. Three major control programs have contributed to the reduced per-vehicle CO emissions: exhaust standards, cleaner burning fuels, and motor vehicle inspection/maintenance programs.

A detailed CO analysis was conducted in the *Federal Attainment Plan for Carbon Monoxide* (CO Plan) for the SCAQMD's 2003 Air Quality Management Plan. The 2003 *Air Quality Management Plan* is the most recent AQMP that addresses CO concentrations. The locations selected for microscale modeling in the CO Plan are worst-case intersections in the Basin, and would likely experience the highest CO concentrations. Thus, CO analysis within the CO Plan is utilized in a comparison to the proposed project, since it represents a worst-case scenario with heavy traffic volumes within the Basin.

Of these locations, the Wilshire Boulevard/Veteran Avenue intersection in Los Angeles experienced the highest CO concentration (4.6 parts per million [ppm]), which is well below the 35-ppm 1-hr CO Federal standard. The Wilshire Boulevard/Veteran Avenue intersection is one of the most congested intersections in Southern California with an average daily traffic (ADT) volume of approximately 100,000 vehicles per day. As the CO hotspots were not experienced at the Wilshire Boulevard/Veteran Avenue intersection, it can be reasonably inferred that CO hotspots would not be experienced at any intersections within the vicinity of the project site due to the low volume of traffic (193 new daily trips) that would occur as a result of project implementation. Therefore, impacts would be less than significant in this regard.

TOXIC AIR CONTAMINANTS

The proposed ISB would include a wet laboratory that would involve the use of chemicals and may include Toxic Air Contaminants (TACs). Laboratory operations that use TACs would be performed in fume hoods to protect people in the laboratory from exposure to hazardous vapors. TAC emissions are first diluted in the fume hood, then the fume hood exhaust is emitted and disperses into the atmosphere. The dilution and dispersion from the fume hoods reduce pollutant concentrations and exposure. Adverse effects associated with pollutant exposure also decrease with distance.

Sensitive receptors located near the proposed project include residents located approximately 575 feet southeast of the project site. The Physical Sciences Classroom Building and Lecture Hall are located approximately 50 feet north of the project site; however these buildings do not have outdoor areas of frequent human use where sensitive receptors could be exposed to TACs through inhalation for extended periods of time.

A quantitative Health Risk Assessment (HRA) was prepared as part of the 2007 LRDP EIR. The HRA estimated TAC emissions from laboratory operations, fuel combustion, and vehicular emissions based on existing emissions inventories and projected campus-wide growth. Air dispersion modeling and risk characterization was conducted to calculate both average and high-end risks for each receptor based on the predicted downwind concentration of TACs, the toxicity of each TAC, and the exposure scenario (residential, occupational, schoolchildren, etc.). Incremental cancer risks (i.e., cancer risks above background levels) and non-cancer hazards were calculated for over 2,600 receptors in the UCI campus vicinity.

Two types of health effects were evaluated in this HRA: cancer risk, which represents the potential for increased risk of cancer in a lifetime associated with exposure to emissions from the implementation of the UCI LRDP, and non-cancer hazards (both chronic and acute) which represent the potential for a non-cancer health effect due to exposure on either a chronic or short-term basis to emissions from the LRDP.

The HRA found incremental cancer risks to be below the SCAQMD significance level of 10 in one million for all receptors and all exposure scenarios. The population cancer burden, based on diesel particulate (the risk driving TAC) was calculated to be 0.0003612, which is well below the SCAQMD's acceptable cancer burden of 0.5. The emissions associated with implementation of the UCI LRDP was therefore found not to pose a significant incremental cancer risk to the surrounding populations. Additionally, the LRDP EIR analysis determined that chronic non-cancer hazards and acute hazards would be below the significance threshold of 1.0 for all receptors. The emissions associated with implementation of the UCI LRDP would therefore not pose a chronic or acute hazard to the surrounding populations.

The HRA within the LRDP EIR analyzed a 140 percent increase in building square footage (the analysis used a baseline of 3,103,000 gross square feet of existing engineering and science building space) at UCI and assumed a comparable increase in percentage of chemical uses would occur. Since completion of the HRA and the LRDP, the campus has added 404,961 gross square feet of engineering and science building space. The HRA analyzed a total of 7,440,000 gross square feet of engineering and science buildings for the LRDP. The post-LRDP space increase is about 5 percent of the total analyzed. Therefore, the proposed ISB would still be within the building square footage assumed in the HRA and would not result in additional impacts beyond what was originally identified in the LRDP EIR.

The HRA included a refined dispersion modeling assessment to estimate project-related pollutant concentrations from on-campus sources. Air dispersion modeling is dependent on the emissions of TACs, the location of sources, and the site-specific meteorology of the impacted area. The dispersion modeling calculated one-hour and annual downwind concentrations to provide an estimate of the amount of TACs to which receptors would be exposed due to operations on the UCI campus. Evaluated land uses in the surrounding area include residential and commercial areas in the immediate vicinity of UCI, student housing on campus, and faculty housing on campus. A receptor grid was set up in the on-campus housing areas to address on-site impacts. In addition, a 100-meter grid was set up to evaluate off-site risks. As noted above, incremental cancer risks (i.e., cancer risks above background levels) and non-cancer hazards were calculated for over 2,600 receptors in the UCI campus vicinity.

The HRA identified the point of maximum impact, the maximally impacted residential receptor, and the maximally impacted occupational receptor. Separate exposure scenarios were evaluated for both on- and off-site residential, occupational, student, and child receptors. The HRA determined that emissions associated with implementation of the UCI LRDP would not pose a significant incremental cancer risk to the surrounding populations. Chronic and acute non-cancer hazards were also found to be less than significant.

The HRA was designed to present an upper-bound calculation of risks to individual receptors on and in the vicinity of the UCI campus. Uncertainties in the emission estimates, dispersion modeling, exposure assessment, and toxicity assessment are designed to provide health-protective estimates of human health risks. Actual risks are likely to be lower than the upper-bound risks presented in the HRA. The findings of the HRA uncertainty evaluation add confidence to the conclusions that the potential incremental cancer risks as well as chronic and acute non-cancer hazards will not exceed significance thresholds.

It should be noted that since completion of the HRA, the California Office of Environmental Health Hazard Assessment (OEHHA) has updated their guidance for health risk assessments to include age sensitivity factors, updated breathing rates, a factor for the fraction of time spent at home, and reduced exposure periods. Methods used in the HRA are conservative in that the methodology is more likely to overestimate than underestimate potential human health impacts. For example, exposed individuals are assumed to live or work at locations where TAC concentrations are predicted to be highest, and are also assumed to be present at these locations for 24 hours per day, 7 days per week, for 70 years (residential exposure), and for 8 hours per day, 5 days per week, for 46 years (occupational exposure). Employing these assumptions results in conservative estimates of the amount of TACs these individuals might inhale, and in conservative estimates of the potential individual health risks. The OEHHA updated breathing rates would represent an increase in risk values. However, the fraction of time at home factor and the reduced exposure period would represent a decrease in the risk values. As such, the updated OEHHA guidance does not invalidate the conservative values in the HRA.

The proposed project would also be required to comply with various State and University regulations to ensure that impacts associated with the laboratory would not occur. Laboratory fume hoods operated on the UCI campus are required to comply with Title 8 of the California Code of Regulations, which contains California Occupational Safety and Health Administration (OSHA) requirements for these emission sources. The regulations are concerned with worker health and safety, requiring a minimum flow of speed, face velocity, and certain design features to protect laboratory personnel in their work. In addition, the code establishes specific requirements for the use and storage of carcinogens, including a requirement to scrub or filter air emissions from areas where carcinogens are used. Furthermore, a wind dispersion analysis will be completed as part of the final project design. Other than the requirement that the top of the fume hood stack must be located at least 7 feet above the roof, the regulations do not address emissions once the exhausted air mixes with outdoor air. Additionally, UCI Environmental Health & Safety and Risk Services provides an air quality program that assists the campus in air pollution prevention and provides compliance assistance on SCAQMD and other Clean Air Act laws and regulations. Therefore, TAC impacts associated with the proposed project would be less than significant.

Mitigation Measures: Refer to Mitigation Measure AQ-1.

Level of Significance After Mitigation. *Less Than Significant Impact.*

AQ-5 CREATE OBJECTIONABLE ODORS AFFECTING A SUBSTANTIAL NUMBER OF PEOPLE?

Level of Significance Before Mitigation: *Less Than Significant Impact.*

According to the SCAQMD *CEQA Air Quality Handbook*, land uses associated with odor complaints typically include agricultural uses, wastewater treatment plants, food processing plants, chemical plants, composting, refineries, landfills, dairies, and fiberglass molding. The proposed project does not include any uses identified by the SCAQMD as being associated with odors.

Construction activities associated with the project may generate detectable odors from heavy-duty equipment exhaust. Construction-related odors would be short-term in nature, dissipate rapidly, and cease upon project completion. Any impacts to existing adjacent land uses would be short-term and are less than significant.

Mitigation Measures: No mitigation measures are required.

Level of Significance After Mitigation. *Less Than Significant Impact.*

6.0 REFERENCES

6.1 LIST OF PREPARERS

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Achilles Malisos, Manager of Air and Noise Studies
Ryan Richards, Environmental Associate
Faye Stroud, Graphics

6.2 DOCUMENTS

1. City of Irvine, *City of Irvine General Plan*, Supp. No. 9, July 2015.

2. City of Irvine, *Municipal Code*, codified through Ordinance No. 15-02, adopted April 28, 2015.

3. City of Irvine, *CEQA Manual*, May 2012.

4. KTGY Architecture + Planning, Conceptual Design, January 27, 2017.

5. South Coast Air Quality Management District, *2016 Air Quality Management Plan*, http://www.aqmd.gov/home/library/clean-air-plans/air-quality-mgt-plan, accessed July 13, 2017.

6. South Coast Air Quality Management District, *CEQA Air Quality Handbook*, November 1993.

7. South Coast Air Quality Management District, *Final Localized Significance Threshold Methodology*, July 2008.

8. South Coast Air Quality Management District, *Regulation XI Source Specific Standards*, http://www.aqmd.gov/docs/default-source/rule-book/reg-xi/r1113.pdf?sfvrsn=15, accessed on July 13, 2017.

9. Stantec Consulting Services, *UCI Interdisciplinary Sciences Building Traffic Study*, July 2017.

10. U.S. Climate Data, *Climate Irvine - California*, http://www.usclimatedata.com/climate/irvine/california/united-states/usca2494, accessed on July 13, 2017.

6.3 WEB SITES/PROGRAMS

California Air Resources Board, *Aerometric Data Analysis and Measurement System (ADAM)*, summaries from 2013 to 2015, http://www.arb.ca.gov/adam.

Environ International Corporation and the South Coast Air Quality Management District, *California Emissions Estimator Model (CalEEMod) Version 2016.3.1*, 2016.

Google Earth, 2017.

APPENDIX A: AIR QUALITY EMISSIONS DATA

UCI ISB

Orange County, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
University/College (4Yr)	200.00	Student	1.00	200,000.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	30
Climate Zone	8			**Operational Year**	2020
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	702.44	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - 200,000 square feet building with 200 people.

Construction Phase - 24 month construction period.

Grading - Project would export 400,000 CF = approx. 14,815 Cubic Yards.

Demolition - Surface parking lot to be removed approx. 160,000 GSF.

Trips and VMT -

Vehicle Trips - Per traffic study the project would generate total of 193 ADT with 200 people.

Stationary Sources - Emergency Generators and Fire Pumps -

Construction Off-road Equipment Mitigation - Per SCAQMD Rule 403.

Area Mitigation -

Energy Mitigation -

Water Mitigation -

Waste Mitigation -

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	CleanPavedRoadPercentReduction	0	6
tblConstDustMitigation	WaterUnpavedRoadMoistureContent	0	12
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstructionPhase	NumDays	5.00	197.00
tblConstructionPhase	NumDays	100.00	436.00
tblConstructionPhase	NumDays	2.00	66.00
tblConstructionPhase	NumDays	5.00	10.00
tblConstructionPhase	PhaseEndDate	3/30/2018	3/31/2020
tblConstructionPhase	PhaseEndDate	3/30/2018	3/31/2020
tblConstructionPhase	PhaseEndDate	3/30/2018	4/13/2018
tblConstructionPhase	PhaseEndDate	3/30/2018	7/16/2018
tblConstructionPhase	PhaseEndDate	3/30/2018	7/30/2018
tblConstructionPhase	PhaseStartDate	3/31/2018	6/30/2019
tblConstructionPhase	PhaseStartDate	3/31/2018	7/31/2018
tblConstructionPhase	PhaseStartDate	3/31/2018	4/14/2018
tblConstructionPhase	PhaseStartDate	3/31/2018	7/17/2018
tblGrading	AcresOfGrading	24.75	0.75
tblGrading	MaterialExported	0.00	14,815.00
tblLandUse	BuildingSpaceSquareFeet	36,759.49	200,000.00
tblLandUse	LandUseSquareFeet	36,759.49	200,000.00
tblLandUse	LotAcreage	0.84	1.00
tblProjectCharacteristics	OperationalYear	2018	2020
tblStationaryGeneratorsPumpsEF	CH4_EF	0.07	0.07
tblStationaryGeneratorsPumpsEF	ROG_EF	2.2480e-003	2.2477e-003
tblStationaryGeneratorsPumpsUse	HorsePowerValue	0.00	2,600.00
tblStationaryGeneratorsPumpsUse	HoursPerYear	0.00	8.00
tblStationaryGeneratorsPumpsUse	NumberOfEquipment	0.00	1.00
tblVehicleTrips	ST_TR	1.30	0.97
tblVehicleTrips	WD_TR	1.71	0.97

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					
2018	3.1551	43.1812	20.0649	0.0714	14.0174	1.5127	15.5301	2.6453	1.4158	3.6811	0.0000	7,618.806 6	7,618.806 6	1.1633	0.0000	7,647.890 2
2019	12.5483	21.8644	19.7511	0.0439	1.3398	1.0779	2.4177	0.3601	1.0449	1.4050	0.0000	4,254.873 8	4,254.873 8	0.5183	0.0000	4,267.831 1
2020	12.2326	20.1775	19.0697	0.0435	1.3398	0.9326	2.2724	0.3601	0.9041	1.2642	0.0000	4,197.282 8	4,197.282 8	0.4931	0.0000	4,209.609 5
Maximum	**12.5483**	**43.1812**	**20.0649**	**0.0714**	**14.0174**	**1.5127**	**15.5301**	**2.6453**	**1.4158**	**3.6811**	**0.0000**	**7,618.806 6**	**7,618.806 6**	**1.1633**	**0.0000**	**7,647.890 2**

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					
2018	3.1551	43.1812	20.0649	0.0714	6.6122	1.5127	8.1249	1.2144	1.4158	2.5547	0.0000	7,618.806 6	7,618.806 6	1.1633	0.0000	7,647.890 2
2019	12.5483	21.8644	19.7511	0.0439	1.2719	1.0779	2.3498	0.3434	1.0449	1.3883	0.0000	4,254.873 8	4,254.873 8	0.5183	0.0000	4,267.831 1
2020	12.2326	20.1775	19.0697	0.0435	1.2719	0.9326	2.2045	0.3434	0.9041	1.2475	0.0000	4,197.282 8	4,197.282 8	0.4931	0.0000	4,209.609 5
Maximum	**12.5483**	**43.1812**	**20.0649**	**0.0714**	**6.6122**	**1.5127**	**8.1249**	**1.2144**	**1.4158**	**2.5547**	**0.0000**	**7,618.806 6**	**7,618.806 6**	**1.1633**	**0.0000**	**7,647.890 2**

	ROG	**NOx**	**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**	**45.16**	**0.00**	**37.29**	**43.51**	**0.00**	**18.26**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	lb/day										lb/day					
Area	4.4699	1.9000e-004	0.0206	0.0000		7.0000e-005	7.0000e-005		7.0000e-005	7.0000e-005		0.0438	0.0438	1.2000e-004		0.0467
Energy	0.0909	0.8262	0.6940	4.9600e-003		0.0628	0.0628		0.0628	0.0628		991.4585	991.4585	0.0190	0.0182	997.3502
Mobile	0.3090	1.2868	3.8879	0.0138	1.2297	0.0142	1.2439	0.3288	0.0133	0.3421		1,394.6432	1,394.6432	0.0614		1,396.1792
Stationary	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**4.8698**	**2.1132**	**4.6025**	**0.0187**	**1.2297**	**0.0770**	**1.3067**	**0.3288**	**0.0762**	**0.4050**		**2,386.1454**	**2,386.1454**	**0.0806**	**0.0182**	**2,393.5761**

Mitigated Operational

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	lb/day										lb/day					
Area	4.4699	1.9000e-004	0.0206	0.0000		7.0000e-005	7.0000e-005		7.0000e-005	7.0000e-005		0.0438	0.0438	1.2000e-004		0.0467
Energy	0.0789	0.7170	0.6022	4.3000e-003		0.0545	0.0545		0.0545	0.0545		860.3384	860.3384	0.0165	0.0158	865.4510
Mobile	0.3090	1.2868	3.8879	0.0138	1.2297	0.0142	1.2439	0.3288	0.0133	0.3421		1,394.6432	1,394.6432	0.0614		1,396.1792
Stationary	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**4.8577**	**2.0039**	**4.5107**	**0.0181**	**1.2297**	**0.0687**	**1.2984**	**0.3288**	**0.0679**	**0.3967**		**2,255.0254**	**2,255.0254**	**0.0781**	**0.0158**	**2,261.6769**

	ROG	NOx	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	0.25	5.17	1.99	3.53	0.00	10.78	0.64	0.00	10.90	2.05	0.00	5.50	5.50	3.12	13.26	5.51

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Grading	Grading	4/14/2018	7/16/2018	5	66	
2	Demolition	Demolition	4/1/2018	4/13/2018	5	10	
3	Paving	Paving	7/17/2018	7/30/2018	5	10	
4	Building Construction	Building Construction	7/31/2018	3/31/2020	5	436	
5	Architectural Coating	Architectural Coating	6/30/2019	3/31/2020	5	197	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0.75

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 300,000; Non-Residential Outdoor: 100,000; Striped Parking

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Architectural Coating	Air Compressors	1	6.00	78	0.48
Paving	Cement and Mortar Mixers	1	6.00	9	0.56
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Cranes	1	6.00	231	0.29
Building Construction	Forklifts	1	6.00	89	0.20
Paving	Pavers	1	6.00	130	0.42
Paving	Rollers	1	7.00	80	0.38
Demolition	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Rubber Tired Dozers	1	6.00	247	0.40
Building Construction	Tractors/Loaders/Backhoes	1	6.00	97	0.37
Demolition	Tractors/Loaders/Backhoes	3	8.00	97	0.37

Grading	Tractors/Loaders/Backhoes	1	7.00	97	0.37
Paving	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Grading	Graders	1	6.00	187	0.41
Paving	Paving Equipment	1	8.00	132	0.36
Building Construction	Welders	3	8.00	46	0.45

<u>Trips and VMT</u>

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	5	13.00	0.00	593.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Grading	3	8.00	0.00	1,852.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	7	84.00	33.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	5	13.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	17.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Replace Ground Cover

Water Exposed Area

Water Unpaved Roads

Reduce Vehicle Speed on Unpaved Roads

Clean Paved Roads

3.2 Grading - 2018

<u>Unmitigated Construction On-Site</u>

	ROG	NOx	CO	SO2	Fugitive 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					4.5540	0.0000	4.5540	2.4878	0.0000	2.4878			0.0000			0.0000
Off-Road	1.4972	17.0666	6.7630	0.0141		0.7947	0.7947		0.7311	0.7311		1,421.2605	1,421.2605	0.4425		1,432.3219

Total	**1.4972**	**17.0666**	**6.7630**	**0.0141**	**4.5540**	**0.7947**	**5.3487**	**2.4878**	**0.7311**	**3.2190**		**1,421.2605**	**1,421.2605**	**0.4425**		**1,432.3219**

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	0.2488	8.8836	2.1200	0.0217	0.4887	0.0356	0.5243	0.1338	0.0341	0.1679		2,406.3589	2,406.3589	0.2620		2,412.9100
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	0.0404	0.0268	0.2918	8.8000e-004	0.0894	5.9000e-004	0.0900	0.0237	5.4000e-004	0.0243		87.5838	87.5838	2.3300e-003		87.6420
Total	**0.2891**	**8.9104**	**2.4117**	**0.0226**	**0.5781**	**0.0362**	**0.6143**	**0.1575**	**0.0346**	**0.1921**		**2,493.9427**	**2,493.9427**	**0.2644**		**2,500.5520**

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					1.9468	0.0000	1.9468	1.0635	0.0000	1.0635			0.0000			0.0000
Off-Road	1.4972	17.0666	6.7630	0.0141		0.7947	0.7947		0.7311	0.7311	0.0000	1,421.2605	1,421.2605	0.4425		1,432.3219
Total	**1.4972**	**17.0666**	**6.7630**	**0.0141**	**1.9468**	**0.7947**	**2.7416**	**1.0635**	**0.7311**	**1.7947**	**0.0000**	**1,421.2605**	**1,421.2605**	**0.4425**		**1,432.3219**

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	0.2488	8.8836	2.1200	0.0217	0.4664	0.0356	0.5020	0.1283	0.0341	0.1624		2,406.3589	2,406.3589	0.2620		2,412.9100
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	0.0404	0.0268	0.2918	8.8000e-004	0.0848	5.9000e-004	0.0854	0.0226	5.4000e-004	0.0231		87.5838	87.5838	2.3300e-003		87.6420
Total	**0.2891**	**8.9104**	**2.4117**	**0.0226**	**0.5512**	**0.0362**	**0.5874**	**0.1509**	**0.0346**	**0.1855**		**2,493.9427**	**2,493.9427**	**0.2644**		**2,500.5520**

3.3 Demolition - 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					
Fugitive Dust					12.8394	0.0000	12.8394	1.9440	0.0000	1.9440			0.0000			0.0000
Off-Road	2.4838	24.3641	15.1107	0.0241		1.4365	1.4365		1.3429	1.3429		2,391.1659	2,391.1659	0.6058		2,406.3105
Total	**2.4838**	**24.3641**	**15.1107**	**0.0241**	**12.8394**	**1.4365**	**14.2759**	**1.9440**	**1.3429**	**3.2869**		**2,391.1659**	**2,391.1659**	**0.6058**		**2,406.3105**

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	0.5257	18.7736	4.4801	0.0459	1.0327	0.0753	1.1080	0.2827	0.0720	0.3548		5,085.3171	5,085.3171	0.5538		5,099.1615
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	0.0656	0.0435	0.4741	1.4300e-003	0.1453	9.6000e-004	0.1463	0.0385	8.8000e-004	0.0394		142.3237	142.3237	3.7800e-003		142.4183
Total	**0.5913**	**18.8171**	**4.9542**	**0.0473**	**1.1780**	**0.0763**	**1.2543**	**0.3213**	**0.0729**	**0.3942**		**5,227.6408**	**5,227.6408**	**0.5576**		**5,241.5797**

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					5.4888	0.0000	5.4888	0.8311	0.0000	0.8311			0.0000			0.0000
Off-Road	2.4838	24.3641	15.1107	0.0241		1.4365	1.4365		1.3429	1.3429	0.0000	2,391.1659	2,391.1659	0.6058		2,406.3105
Total	**2.4838**	**24.3641**	**15.1107**	**0.0241**	**5.4888**	**1.4365**	**6.9253**	**0.8311**	**1.3429**	**2.1740**	**0.0000**	**2,391.1659**	**2,391.1659**	**0.6058**		**2,406.3105**

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	0.5257	18.7736	4.4801	0.0459	0.9857	0.0753	1.0610	0.2712	0.0720	0.3432		5,085.3171	5,085.3171	0.5538		5,099.1615
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	0.0656	0.0435	0.4741	1.4300e-003	0.1377	9.6000e-004	0.1387	0.0367	8.8000e-004	0.0376		142.3237	142.3237	3.7800e-003		142.4183
Total	**0.5913**	**18.8171**	**4.9542**	**0.0473**	**1.1234**	**0.0763**	**1.1996**	**0.3079**	**0.0729**	**0.3808**		**5,227.6408**	**5,227.6408**	**0.5576**		**5,241.5797**

3.4 Paving - 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	1.0182	10.4525	8.9926	0.0135		0.6097	0.6097		0.5618	0.5618		1,346.4360	1,346.4360	0.4113		1,356.7186
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.0182**	**10.4525**	**8.9926**	**0.0135**		**0.6097**	**0.6097**		**0.5618**	**0.5618**		**1,346.4360**	**1,346.4360**	**0.4113**		**1,356.7186**

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	0.0656	0.0435	0.4741	1.4300e-003	0.1453	9.6000e-004	0.1463	0.0385	8.8000e-004	0.0394		142.3237	142.3237	3.7800e-003		142.4183
Total	**0.0656**	**0.0435**	**0.4741**	**1.4300e-003**	**0.1453**	**9.6000e-004**	**0.1463**	**0.0385**	**8.8000e-004**	**0.0394**		**142.3237**	**142.3237**	**3.7800e-003**		**142.4183**

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	1.0182	10.4525	8.9926	0.0135		0.6097	0.6097		0.5618	0.5618	0.0000	1,346.4360	1,346.4360	0.4113		1,356.7186

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.0182**	**10.4525**	**8.9926**	**0.0135**		**0.6097**	**0.6097**		**0.5618**	**0.5618**	**0.0000**	**1,346.4360**	**1,346.4360**	**0.4113**		**1,356.7186**

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	0.0656	0.0435	0.4741	1.4300e-003	0.1377	9.6000e-004	0.1387	0.0367	8.8000e-004	0.0376		142.3237	142.3237	3.7800e-003		142.4183
Total	**0.0656**	**0.0435**	**0.4741**	**1.4300e-003**	**0.1377**	**9.6000e-004**	**0.1387**	**0.0367**	**8.8000e-004**	**0.0376**		**142.3237**	**142.3237**	**3.7800e-003**		**142.4183**

3.5 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	2.5919	17.4280	13.8766	0.0220		1.0580	1.0580		1.0216	1.0216		2,030.8389	2,030.8389	0.4088		2,041.0596
Total	**2.5919**	**17.4280**	**13.8766**	**0.0220**		**1.0580**	**1.0580**		**1.0216**	**1.0216**		**2,030.8389**	**2,030.8389**	**0.4088**		**2,041.0596**

Unmitigated Construction Off-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	lb/day										lb/day					
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	0.1395	3.9430	1.1594	8.1500e-003	0.2109	0.0297	0.2405	0.0607	0.0284	0.0891		883.4586	883.4586	0.0828		885.5290
Worker	0.4237	0.2811	3.0636	9.2300e-003	0.9389	6.2000e-003	0.9451	0.2490	5.7100e-003	0.2547		919.6298	919.6298	0.0245		920.2410
Total	**0.5632**	**4.2241**	**4.2230**	**0.0174**	**1.1498**	**0.0359**	**1.1856**	**0.3097**	**0.0341**	**0.3438**		**1,803.0884**	**1,803.0884**	**0.1073**		**1,805.7700**

Mitigated Construction On-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	lb/day										lb/day					
Off-Road	2.5919	17.4280	13.8766	0.0220		1.0580	1.0580		1.0216	1.0216	0.0000	2,030.8389	2,030.8389	0.4088		2,041.0596
Total	**2.5919**	**17.4280**	**13.8766**	**0.0220**		**1.0580**	**1.0580**		**1.0216**	**1.0216**	**0.0000**	**2,030.8389**	**2,030.8389**	**0.4088**		**2,041.0596**

Mitigated Construction Off-Site

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

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Vendor	0.1395	3.9430	1.1594	8.1500e-003	0.2018	0.0297	0.2315	0.0585	0.0284	0.0868		883.4586	883.4586	0.0828		885.5290
Worker	0.4237	0.2811	3.0636	9.2300e-003	0.8900	6.2000e-003	0.8962	0.2370	5.7100e-003	0.2427		919.6298	919.6298	0.0245		920.2410
Total	**0.5632**	**4.2241**	**4.2230**	**0.0174**	**1.0918**	**0.0359**	**1.1276**	**0.2955**	**0.0341**	**0.3295**		**1,803.0884**	**1,803.0884**	**0.1073**		**1,805.7700**

3.5 Building Construction - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.2721	15.9802	13.4870	0.0220		0.9158	0.9158		0.8846	0.8846		2,018.0224	2,018.0224	0.3879		2,027.7210
Total	**2.2721**	**15.9802**	**13.4870**	**0.0220**		**0.9158**	**0.9158**		**0.8846**	**0.8846**		**2,018.0224**	**2,018.0224**	**0.3879**		**2,027.7210**

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	0.1290	3.7488	1.0869	8.0900e-003	0.2109	0.0258	0.2366	0.0607	0.0247	0.0853		878.9719	878.9719	0.0801		880.9733
Worker	0.3906	0.2495	2.7744	8.9800e-003	0.9389	6.2700e-003	0.9452	0.2490	5.7800e-003	0.2548		895.2499	895.2499	0.0221		895.8013
Total	**0.5196**	**3.9983**	**3.8613**	**0.0171**	**1.1498**	**0.0320**	**1.1818**	**0.3097**	**0.0304**	**0.3401**		**1,774.2218**	**1,774.2218**	**0.1021**		**1,776.7747**

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	2.2721	15.9802	13.4870	0.0220		0.9158	0.9158		0.8846	0.8846	0.0000	2,018.0224	2,018.0224	0.3879		2,027.7210
Total	**2.2721**	**15.9802**	**13.4870**	**0.0220**		**0.9158**	**0.9158**		**0.8846**	**0.8846**	**0.0000**	**2,018.0224**	**2,018.0224**	**0.3879**		**2,027.7210**

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	0.1290	3.7488	1.0869	8.0900e-003	0.2018	0.0258	0.2276	0.0585	0.0247	0.0831		878.9719	878.9719	0.0801		880.9733
Worker	0.3906	0.2495	2.7744	8.9800e-003	0.8900	6.2700e-003	0.8962	0.2370	5.7800e-003	0.2428		895.2499	895.2499	0.0221		895.8013
Total	**0.5196**	**3.9983**	**3.8613**	**0.0171**	**1.0918**	**0.0320**	**1.1238**	**0.2955**	**0.0304**	**0.3259**		**1,774.2218**	**1,774.2218**	**0.1021**		**1,776.7747**

3.5 Building Construction - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.0305	14.7882	13.1881	0.0220		0.7960	0.7960		0.7688	0.7688		2,001.1595	2,001.1595	0.3715		2,010.4467

Total	2.0305	14.7882	13.1881	0.0220		0.7960	0.7960		0.7688	0.7688		2,001.1595	2,001.1595	0.3715		2,010.4467

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	0.1101	3.4367	0.9946	8.0200e-003	0.2109	0.0182	0.2291	0.0607	0.0175	0.0781		872.7379	872.7379	0.0760		874.6383
Worker	0.3648	0.2235	2.5413	8.6900e-003	0.9389	6.2100e-003	0.9451	0.2490	5.7200e-003	0.2547		866.5618	866.5618	0.0198		867.0560
Total	**0.4749**	**3.6602**	**3.5359**	**0.0167**	**1.1498**	**0.0245**	**1.1742**	**0.3097**	**0.0232**	**0.3329**		**1,739.2997**	**1,739.2997**	**0.0958**		**1,741.6944**

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	2.0305	14.7882	13.1881	0.0220		0.7960	0.7960		0.7688	0.7688	0.0000	2,001.1595	2,001.1595	0.3715		2,010.4467
Total	**2.0305**	**14.7882**	**13.1881**	**0.0220**		**0.7960**	**0.7960**		**0.7688**	**0.7688**	**0.0000**	**2,001.1595**	**2,001.1595**	**0.3715**		**2,010.4467**

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	0.1101	3.4367	0.9946	8.0200e-003	0.2018	0.0182	0.2201	0.0585	0.0175	0.0759		872.7379	872.7379	0.0760		874.6383
Worker	0.3648	0.2235	2.5413	8.6900e-003	0.8900	6.2100e-003	0.8962	0.2370	5.7200e-003	0.2427		866.5618	866.5618	0.0198		867.0560
Total	**0.4749**	**3.6602**	**3.5359**	**0.0167**	**1.0918**	**0.0245**	**1.1162**	**0.2955**	**0.0232**	**0.3186**		**1,739.2997**	**1,739.2997**	**0.0958**		**1,741.6944**

3.6 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	9.4112					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		282.0423
Total	**9.6776**	**1.8354**	**1.8413**	**2.9700e-003**		**0.1288**	**0.1288**		**0.1288**	**0.1288**		**281.4481**	**281.4481**	**0.0238**		**282.0423**

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

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
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	0.0790	0.0505	0.5615	1.8200e-003	0.1900	1.2700e-003	0.1913	0.0504	1.1700e-003	0.0516		181.1815	181.1815	4.4600e-003		181.2931
Total	**0.0790**	**0.0505**	**0.5615**	**1.8200e-003**	**0.1900**	**1.2700e-003**	**0.1913**	**0.0504**	**1.1700e-003**	**0.0516**		**181.1815**	**181.1815**	**4.4600e-003**		**181.2931**

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	9.4112					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		282.0423
Total	**9.6776**	**1.8354**	**1.8413**	**2.9700e-003**		**0.1288**	**0.1288**		**0.1288**	**0.1288**	**0.0000**	**281.4481**	**281.4481**	**0.0238**		**282.0423**

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	0.0790	0.0505	0.5615	1.8200e-003	0.1801	1.2700e-003	0.1814	0.0480	1.1700e-003	0.0491		181.1815	181.1815	4.4600e-003		181.2931
Total	**0.0790**	**0.0505**	**0.5615**	**1.8200e-003**	**0.1801**	**1.2700e-003**	**0.1814**	**0.0480**	**1.1700e-003**	**0.0491**		**181.1815**	**181.1815**	**4.4600e-003**		**181.2931**

3.6 Architectural Coating - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	9.4112					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2422	1.6838	1.8314	2.9700e-003		0.1109	0.1109		0.1109	0.1109		281.4481	281.4481	0.0218		281.9928
Total	**9.6534**	**1.6838**	**1.8314**	**2.9700e-003**		**0.1109**	**0.1109**		**0.1109**	**0.1109**		**281.4481**	**281.4481**	**0.0218**		**281.9928**

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	0.0738	0.0452	0.5143	1.7600e-003	0.1900	1.2600e-003	0.1913	0.0504	1.1600e-003	0.0516		175.3756	175.3756	4.0000e-003		175.4756
Total	**0.0738**	**0.0452**	**0.5143**	**1.7600e-003**	**0.1900**	**1.2600e-003**	**0.1913**	**0.0504**	**1.1600e-003**	**0.0516**		**175.3756**	**175.3756**	**4.0000e-003**		**175.4756**

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	9.4112					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000

Off-Road	0.2422	1.6838	1.8314	2.9700e-003		0.1109	0.1109		0.1109	0.1109	0.0000	281.4481	281.4481	0.0218		281.9928
Total	**9.6534**	**1.6838**	**1.8314**	**2.9700e-003**		**0.1109**	**0.1109**		**0.1109**	**0.1109**	**0.0000**	**281.4481**	**281.4481**	**0.0218**		**281.9928**

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	0.0738	0.0452	0.5143	1.7600e-003	0.1801	1.2600e-003	0.1814	0.0480	1.1600e-003	0.0491		175.3756	175.3756	4.0000e-003		175.4756
Total	**0.0738**	**0.0452**	**0.5143**	**1.7600e-003**	**0.1801**	**1.2600e-003**	**0.1814**	**0.0480**	**1.1600e-003**	**0.0491**		**175.3756**	**175.3756**	**4.0000e-003**		**175.4756**

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	0.3090	1.2868	3.8879	0.0138	1.2297	0.0142	1.2439	0.3288	0.0133	0.3421		1,394.6432	1,394.6432	0.0614		1,396.1792
Unmitigated	0.3090	1.2868	3.8879	0.0138	1.2297	0.0142	1.2439	0.3288	0.0133	0.3421		1,394.6432	1,394.6432	0.0614		1,396.1792

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
University/College (4Yr)	193.00	193.00	0.00	496,929	496,929
Total	193.00	193.00	0.00	496,929	496,929

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)	16.60	8.40	6.90	6.40	88.60	5.00	91	9	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
University/College (4Yr)	0.555968	0.043848	0.210359	0.116378	0.016765	0.005795	0.025008	0.016160	0.001677	0.001586	0.004867	0.000586	0.001002

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

Exceed Title 24

Install High Efficiency Lighting

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0789	0.7170	0.6022	4.3000e-003		0.0545	0.0545		0.0545	0.0545		860.3384	860.3384	0.0165	0.0158	865.4510

NaturalGas Unmitigated	0.0909	0.8262	0.6940	4.9600e-003		0.0628	0.0628		0.0628	0.0628		991.4585	991.4585	0.0190	0.0182	997.3502

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)	8427.4	0.0909	0.8262	0.6940	4.9600e-003		0.0628	0.0628		0.0628	0.0628		991.4585	991.4585	0.0190	0.0182	997.3502
Total		**0.0909**	**0.8262**	**0.6940**	**4.9600e-003**		**0.0628**	**0.0628**		**0.0628**	**0.0628**		**991.4585**	**991.4585**	**0.0190**	**0.0182**	**997.3502**

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)	7.31288	0.0789	0.7170	0.6022	4.3000e-003		0.0545	0.0545		0.0545	0.0545		860.3384	860.3384	0.0165	0.0158	865.4510
Total		**0.0789**	**0.7170**	**0.6022**	**4.3000e-003**		**0.0545**	**0.0545**		**0.0545**	**0.0545**		**860.3384**	**860.3384**	**0.0165**	**0.0158**	**865.4510**

6.0 Area Detail

6.1 Mitigation Measures Area

Use Low VOC Paint - Non-Residential Interior

Use Low VOC Paint - Non-Residential Exterior

Use Low VOC Cleaning Supplies

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	lb/day										lb/day					
Mitigated	4.4699	1.9000e-004	0.0206	0.0000		7.0000e-005	7.0000e-005		7.0000e-005	7.0000e-005		0.0438	0.0438	1.2000e-004		0.0467
Unmitigated	4.4699	1.9000e-004	0.0206	0.0000		7.0000e-005	7.0000e-005		7.0000e-005	7.0000e-005		0.0438	0.0438	1.2000e-004		0.0467

6.2 Area by SubCategory

Unmitigated

SubCategory	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	lb/day										lb/day					
Architectural Coating	0.5080					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	3.9600					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	1.9300e-003	1.9000e-004	0.0206	0.0000		7.0000e-005	7.0000e-005		7.0000e-005	7.0000e-005		0.0438	0.0438	1.2000e-004		0.0467
Total	**4.4699**	**1.9000e-004**	**0.0206**	**0.0000**		**7.0000e-005**	**7.0000e-005**		**7.0000e-005**	**7.0000e-005**		**0.0438**	**0.0438**	**1.2000e-004**		**0.0467**

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	0.5080					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	3.9600					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	1.9300e-003	1.9000e-004	0.0206	0.0000		7.0000e-005	7.0000e-005		7.0000e-005	7.0000e-005		0.0438	0.0438	1.2000e-004		0.0467
Total	**4.4699**	**1.9000e-004**	**0.0206**	**0.0000**		**7.0000e-005**	**7.0000e-005**		**7.0000e-005**	**7.0000e-005**		**0.0438**	**0.0438**	**1.2000e-004**		**0.0467**

7.0 Water Detail

7.1 Mitigation Measures Water

Install Low Flow Bathroom Faucet

Install Low Flow Kitchen Faucet

Install Low Flow Toilet

Install Low Flow Shower

8.0 Waste Detail

8.1 Mitigation Measures Waste

Institute Recycling and Composting Services

9.0 Operational Offroad

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

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type
Emergency Generator	1	0	8	2600	0.73	Diesel

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

10.1 Stationary Sources

Unmitigated/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
Equipment Type	lb/day										lb/day					
Emergency Generator - Diesel	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

11.0 Vegetation

UCI ISB

Orange County, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
University/College (4Yr)	200.00	Student	1.00	200,000.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	30
Climate Zone	8			**Operational Year**	2020
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	702.44	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - 200,000 square feet building with 200 people.

Construction Phase - 24 month construction period.

Grading - Project would export 400,000 CF = approx. 14,815 Cubic Yards.

Demolition - Surface parking lot to be removed approx. 160,000 GSF.

Trips and VMT -

Vehicle Trips - Per traffic study the project would generate total of 193 ADT with 200 people.

Stationary Sources - Emergency Generators and Fire Pumps -

Construction Off-road Equipment Mitigation - Per SCAQMD Rule 403.

Area Mitigation -

Energy Mitigation -

Water Mitigation -

Waste Mitigation -

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	CleanPavedRoadPercentReduction	0	6
tblConstDustMitigation	WaterUnpavedRoadMoistureContent	0	12
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstructionPhase	NumDays	5.00	197.00
tblConstructionPhase	NumDays	100.00	436.00
tblConstructionPhase	NumDays	2.00	66.00
tblConstructionPhase	NumDays	5.00	10.00
tblConstructionPhase	PhaseEndDate	3/30/2018	3/31/2020
tblConstructionPhase	PhaseEndDate	3/30/2018	3/31/2020
tblConstructionPhase	PhaseEndDate	3/30/2018	4/13/2018
tblConstructionPhase	PhaseEndDate	3/30/2018	7/16/2018
tblConstructionPhase	PhaseEndDate	3/30/2018	7/30/2018
tblConstructionPhase	PhaseStartDate	3/31/2018	6/30/2019
tblConstructionPhase	PhaseStartDate	3/31/2018	7/31/2018
tblConstructionPhase	PhaseStartDate	3/31/2018	4/14/2018
tblConstructionPhase	PhaseStartDate	3/31/2018	7/17/2018
tblGrading	AcresOfGrading	24.75	0.75
tblGrading	MaterialExported	0.00	14,815.00
tblLandUse	BuildingSpaceSquareFeet	36,759.49	200,000.00
tblLandUse	LandUseSquareFeet	36,759.49	200,000.00
tblLandUse	LotAcreage	0.84	1.00
tblProjectCharacteristics	OperationalYear	2018	2020
tblStationaryGeneratorsPumpsEF	CH4_EF	0.07	0.07
tblStationaryGeneratorsPumpsEF	ROG_EF	2.2480e-003	2.2477e-003
tblStationaryGeneratorsPumpsUse	HorsePowerValue	0.00	2,600.00
tblStationaryGeneratorsPumpsUse	HoursPerYear	0.00	8.00
tblStationaryGeneratorsPumpsUse	NumberOfEquipment	0.00	1.00
tblVehicleTrips	ST_TR	1.30	0.97
tblVehicleTrips	WD_TR	1.71	0.97

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					
2018	3.1017	42.9291	19.8368	0.0722	14.0174	1.5110	15.5284	2.6453	1.4142	3.6795	0.0000	7,702.6899	7,702.6899	1.1490	0.0000	7,731.4137
2019	12.4897	21.8333	19.9214	0.0447	1.3398	1.0774	2.4172	0.3601	1.0445	1.4045	0.0000	4,337.6694	4,337.6694	0.5157	0.0000	4,350.5625
2020	12.1774	20.1545	19.2329	0.0443	1.3398	0.9323	2.2721	0.3601	0.9038	1.2639	0.0000	4,278.2771	4,278.2771	0.4907	0.0000	4,290.5456
Maximum	**12.4897**	**42.9291**	**19.9214**	**0.0722**	**14.0174**	**1.5110**	**15.5284**	**2.6453**	**1.4142**	**3.6795**	**0.0000**	**7,702.6899**	**7,702.6899**	**1.1490**	**0.0000**	**7,731.4137**

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					
2018	3.1017	42.9291	19.8368	0.0722	6.6122	1.5110	8.1232	1.2144	1.4142	2.5531	0.0000	7,702.6899	7,702.6899	1.1490	0.0000	7,731.4137
2019	12.4897	21.8333	19.9214	0.0447	1.2719	1.0774	2.3493	0.3434	1.0445	1.3879	0.0000	4,337.6694	4,337.6694	0.5157	0.0000	4,350.5625
2020	12.1774	20.1545	19.2329	0.0443	1.2719	0.9323	2.2042	0.3434	0.9038	1.2472	0.0000	4,278.2771	4,278.2771	0.4907	0.0000	4,290.5456
Maximum	**12.4897**	**42.9291**	**19.9214**	**0.0722**	**6.6122**	**1.5110**	**8.1232**	**1.2144**	**1.4142**	**2.5531**	**0.0000**	**7,702.6899**	**7,702.6899**	**1.1490**	**0.0000**	**7,731.4137**

	ROG	**NOx**	**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**	**45.16**	**0.00**	**37.30**	**43.51**	**0.00**	**18.27**	**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	4.4699	1.9000e-004	0.0206	0.0000		7.0000e-005	7.0000e-005		7.0000e-005	7.0000e-005		0.0438	0.0438	1.2000e-004		0.0467
Energy	0.0909	0.8262	0.6940	4.9600e-003		0.0628	0.0628		0.0628	0.0628		991.4585	991.4585	0.0190	0.0182	997.3502
Mobile	0.3136	1.2495	4.0470	0.0144	1.2297	0.0141	1.2438	0.3288	0.0132	0.3421		1,460.0465	1,460.0465	0.0616		1,461.5872
Stationary	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**4.8743**	**2.0759**	**4.7616**	**0.0194**	**1.2297**	**0.0770**	**1.3067**	**0.3288**	**0.0761**	**0.4049**		**2,451.5487**	**2,451.5487**	**0.0808**	**0.0182**	**2,458.9841**

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	4.4699	1.9000e-004	0.0206	0.0000		7.0000e-005	7.0000e-005		7.0000e-005	7.0000e-005		0.0438	0.0438	1.2000e-004		0.0467
Energy	0.0789	0.7170	0.6022	4.3000e-003		0.0545	0.0545		0.0545	0.0545		860.3384	860.3384	0.0165	0.0158	865.4510
Mobile	0.3136	1.2495	4.0470	0.0144	1.2297	0.0141	1.2438	0.3288	0.0132	0.3421		1,460.0465	1,460.0465	0.0616		1,461.5872
Stationary	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**4.8623**	**1.9667**	**4.6698**	**0.0187**	**1.2297**	**0.0687**	**1.2984**	**0.3288**	**0.0678**	**0.3966**		**2,320.4287**	**2,320.4287**	**0.0782**	**0.0158**	**2,327.0849**

	ROG	**NOx**	**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	0.25	5.26	1.93	3.41	0.00	10.78	0.64	0.00	10.91	2.05	0.00	5.35	5.35	3.11	13.26	5.36

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Grading	Grading	4/14/2018	7/16/2018	5	66	
2	Demolition	Demolition	4/1/2018	4/13/2018	5	10	
3	Paving	Paving	7/17/2018	7/30/2018	5	10	
4	Building Construction	Building Construction	7/31/2018	3/31/2020	5	436	
5	Architectural Coating	Architectural Coating	6/30/2019	3/31/2020	5	197	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0.75

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 300,000; Non-Residential Outdoor: 100,000; Striped Parking

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Architectural Coating	Air Compressors	1	6.00	78	0.48
Paving	Cement and Mortar Mixers	1	6.00	9	0.56
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Cranes	1	6.00	231	0.29
Building Construction	Forklifts	1	6.00	89	0.20
Paving	Pavers	1	6.00	130	0.42
Paving	Rollers	1	7.00	80	0.38
Demolition	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Rubber Tired Dozers	1	6.00	247	0.40
Building Construction	Tractors/Loaders/Backhoes	1	6.00	97	0.37
Demolition	Tractors/Loaders/Backhoes	3	8.00	97	0.37

Grading	Tractors/Loaders/Backhoes	1	7.00	97	0.37
Paving	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Grading	Graders	1	6.00	187	0.41
Paving	Paving Equipment	1	8.00	132	0.36
Building Construction	Welders	3	8.00	46	0.45

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	5	13.00	0.00	593.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Grading	3	8.00	0.00	1,852.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	7	84.00	33.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	5	13.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	17.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Replace Ground Cover

Water Exposed Area

Water Unpaved Roads

Reduce Vehicle Speed on Unpaved Roads

Clean Paved Roads

3.2 Grading - 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					
Fugitive Dust					4.5540	0.0000	4.5540	2.4878	0.0000	2.4878			0.0000			0.0000
Off-Road	1.4972	17.0666	6.7630	0.0141		0.7947	0.7947		0.7311	0.7311		1,421.2605	1,421.2605	0.4425		1,432.3219

Total	**1.4972**	**17.0666**	**6.7630**	**0.0141**	**4.5540**	**0.7947**	**5.3487**	**2.4878**	**0.7311**	**3.2190**		**1,421.2605**	**1,421.2605**	**0.4425**		**1,432.3219**

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	0.2421	8.7662	1.9947	0.0220	0.4887	0.0348	0.5235	0.1338	0.0333	0.1671		2,442.2457	2,442.2457	0.2551		2,448.6243
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	0.0358	0.0244	0.3142	9.3000e-004	0.0894	5.9000e-004	0.0900	0.0237	5.4000e-004	0.0243		92.5341	92.5341	2.4500e-003		92.5953
Total	**0.2779**	**8.7905**	**2.3090**	**0.0230**	**0.5781**	**0.0354**	**0.6135**	**0.1575**	**0.0339**	**0.1914**		**2,534.7798**	**2,534.7798**	**0.2576**		**2,541.2196**

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					1.9468	0.0000	1.9468	1.0635	0.0000	1.0635			0.0000			0.0000
Off-Road	1.4972	17.0666	6.7630	0.0141		0.7947	0.7947		0.7311	0.7311	0.0000	1,421.2605	1,421.2605	0.4425		1,432.3219
Total	**1.4972**	**17.0666**	**6.7630**	**0.0141**	**1.9468**	**0.7947**	**2.7416**	**1.0635**	**0.7311**	**1.7947**	**0.0000**	**1,421.2605**	**1,421.2605**	**0.4425**		**1,432.3219**

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	0.2421	8.7662	1.9947	0.0220	0.4664	0.0348	0.5012	0.1283	0.0333	0.1616		2,442.2457	2,442.2457	0.2551		2,448.6243
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	0.0358	0.0244	0.3142	9.3000e-004	0.0848	5.9000e-004	0.0854	0.0226	5.4000e-004	0.0231		92.5341	92.5341	2.4500e-003		92.5953
Total	**0.2779**	**8.7905**	**2.3090**	**0.0230**	**0.5512**	**0.0354**	**0.5866**	**0.1509**	**0.0339**	**0.1848**		**2,534.7798**	**2,534.7798**	**0.2576**		**2,541.2196**

3.3 Demolition - 2018

<u>Unmitigated Construction On-Site</u>

	ROG	NOx	CO	SO2	Fugitive 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					12.8394	0.0000	12.8394	1.9440	0.0000	1.9440			0.0000			0.0000
Off-Road	2.4838	24.3641	15.1107	0.0241		1.4365	1.4365		1.3429	1.3429		2,391.1659	2,391.1659	0.6058		2,406.3105
Total	**2.4838**	**24.3641**	**15.1107**	**0.0241**	**12.8394**	**1.4365**	**14.2759**	**1.9440**	**1.3429**	**3.2869**		**2,391.1659**	**2,391.1659**	**0.6058**		**2,406.3105**

<u>Unmitigated Construction Off-Site</u>

	ROG	NOx	CO	SO2	Fugitive 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	0.5116	18.5255	4.2154	0.0465	1.0327	0.0736	1.1063	0.2827	0.0704	0.3531		5,161.1562	5,161.1562	0.5392		5,174.6359
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	0.0582	0.0396	0.5107	1.5100e-003	0.1453	9.6000e-004	0.1463	0.0385	8.8000e-004	0.0394		150.3678	150.3678	3.9800e-003		150.4674
Total	**0.5698**	**18.5650**	**4.7261**	**0.0481**	**1.1780**	**0.0746**	**1.2526**	**0.3213**	**0.0713**	**0.3926**		**5,311.5240**	**5,311.5240**	**0.5432**		**5,325.1032**

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					5.4888	0.0000	5.4888	0.8311	0.0000	0.8311			0.0000			0.0000
Off-Road	2.4838	24.3641	15.1107	0.0241		1.4365	1.4365		1.3429	1.3429	0.0000	2,391.1659	2,391.1659	0.6058		2,406.3105
Total	**2.4838**	**24.3641**	**15.1107**	**0.0241**	**5.4888**	**1.4365**	**6.9253**	**0.8311**	**1.3429**	**2.1740**	**0.0000**	**2,391.1659**	**2,391.1659**	**0.6058**		**2,406.3105**

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	0.5116	18.5255	4.2154	0.0465	0.9857	0.0736	1.0593	0.2712	0.0704	0.3416		5,161.1562	5,161.1562	0.5392		5,174.6359
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	0.0582	0.0396	0.5107	1.5100e-003	0.1377	9.6000e-004	0.1387	0.0367	8.8000e-004	0.0376		150.3678	150.3678	3.9800e-003		150.4674
Total	**0.5698**	**18.5650**	**4.7261**	**0.0481**	**1.1234**	**0.0746**	**1.1980**	**0.3079**	**0.0713**	**0.3792**		**5,311.5240**	**5,311.5240**	**0.5432**		**5,325.1032**

3.4 Paving - 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	1.0182	10.4525	8.9926	0.0135		0.6097	0.6097		0.5618	0.5618		1,346.4360	1,346.4360	0.4113		1,356.7186
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.0182**	**10.4525**	**8.9926**	**0.0135**		**0.6097**	**0.6097**		**0.5618**	**0.5618**		**1,346.4360**	**1,346.4360**	**0.4113**		**1,356.7186**

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	0.0582	0.0396	0.5107	1.5100e-003	0.1453	9.6000e-004	0.1463	0.0385	8.8000e-004	0.0394		150.3678	150.3678	3.9800e-003		150.4674
Total	**0.0582**	**0.0396**	**0.5107**	**1.5100e-003**	**0.1453**	**9.6000e-004**	**0.1463**	**0.0385**	**8.8000e-004**	**0.0394**		**150.3678**	**150.3678**	**3.9800e-003**		**150.4674**

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	1.0182	10.4525	8.9926	0.0135		0.6097	0.6097		0.5618	0.5618	0.0000	1,346.4360	1,346.4360	0.4113		1,356.7186

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.0182**	**10.4525**	**8.9926**	**0.0135**		**0.6097**	**0.6097**		**0.5618**	**0.5618**	**0.0000**	**1,346.4360**	**1,346.4360**	**0.4113**		**1,356.7186**

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	0.0582	0.0396	0.5107	1.5100e-003	0.1377	9.6000e-004	0.1387	0.0367	8.8000e-004	0.0376		150.3678	150.3678	3.9800e-003		150.4674
Total	**0.0582**	**0.0396**	**0.5107**	**1.5100e-003**	**0.1377**	**9.6000e-004**	**0.1387**	**0.0367**	**8.8000e-004**	**0.0376**		**150.3678**	**150.3678**	**3.9800e-003**		**150.4674**

3.5 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	2.5919	17.4280	13.8766	0.0220		1.0580	1.0580		1.0216	1.0216		2,030.8389	2,030.8389	0.4088		2,041.0596
Total	**2.5919**	**17.4280**	**13.8766**	**0.0220**		**1.0580**	**1.0580**		**1.0216**	**1.0216**		**2,030.8389**	**2,030.8389**	**0.4088**		**2,041.0596**

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	0.1337	3.9367	1.0562	8.3500e-003	0.2109	0.0291	0.2400	0.0607	0.0279	0.0886		905.2835	905.2835	0.0786		907.2475
Worker	0.3761	0.2557	3.2996	9.7500e-003	0.9389	6.2000e-003	0.9451	0.2490	5.7100e-003	0.2547		971.6076	971.6076	0.0257		972.2508
Total	**0.5098**	**4.1924**	**4.3558**	**0.0181**	**1.1498**	**0.0353**	**1.1851**	**0.3097**	**0.0336**	**0.3433**		**1,876.8911**	**1,876.8911**	**0.1043**		**1,879.4983**

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	2.5919	17.4280	13.8766	0.0220		1.0580	1.0580		1.0216	1.0216	0.0000	2,030.8389	2,030.8389	0.4088		2,041.0596
Total	**2.5919**	**17.4280**	**13.8766**	**0.0220**		**1.0580**	**1.0580**		**1.0216**	**1.0216**	**0.0000**	**2,030.8389**	**2,030.8389**	**0.4088**		**2,041.0596**

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	0.1337	3.9367	1.0562	8.3500e-003	0.2018	0.0291	0.2310	0.0585	0.0279	0.0863		905.2835	905.2835	0.0786		907.2475
Worker	0.3761	0.2557	3.2996	9.7500e-003	0.8900	6.2000e-003	0.8962	0.2370	5.7100e-003	0.2427		971.6076	971.6076	0.0257		972.2508
Total	**0.5098**	**4.1924**	**4.3558**	**0.0181**	**1.0918**	**0.0353**	**1.1271**	**0.2955**	**0.0336**	**0.3290**		**1,876.8911**	**1,876.8911**	**0.1043**		**1,879.4983**

3.5 Building Construction - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.2721	15.9802	13.4870	0.0220		0.9158	0.9158		0.8846	0.8846		2,018.0224	2,018.0224	0.3879		2,027.7210
Total	**2.2721**	**15.9802**	**13.4870**	**0.0220**		**0.9158**	**0.9158**		**0.8846**	**0.8846**		**2,018.0224**	**2,018.0224**	**0.3879**		**2,027.7210**

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	0.1237	3.7448	0.9899	8.2900e-003	0.2109	0.0253	0.2362	0.0607	0.0242	0.0849		900.7973	900.7973	0.0761		902.6984
Worker	0.3462	0.2270	2.9966	9.4900e-003	0.9389	6.2700e-003	0.9452	0.2490	5.7800e-003	0.2548		945.9579	945.9579	0.0233		946.5393
Total	**0.4699**	**3.9718**	**3.9866**	**0.0178**	**1.1498**	**0.0316**	**1.1813**	**0.3097**	**0.0300**	**0.3397**		**1,846.7551**	**1,846.7551**	**0.0993**		**1,849.2377**

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	2.2721	15.9802	13.4870	0.0220		0.9158	0.9158		0.8846	0.8846	0.0000	2,018.0224	2,018.0224	0.3879		2,027.7210
Total	**2.2721**	**15.9802**	**13.4870**	**0.0220**		**0.9158**	**0.9158**		**0.8846**	**0.8846**	**0.0000**	**2,018.0224**	**2,018.0224**	**0.3879**		**2,027.7210**

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	0.1237	3.7448	0.9899	8.2900e-003	0.2018	0.0253	0.2271	0.0585	0.0242	0.0827		900.7973	900.7973	0.0761		902.6984
Worker	0.3462	0.2270	2.9966	9.4900e-003	0.8900	6.2700e-003	0.8962	0.2370	5.7800e-003	0.2428		945.9579	945.9579	0.0233		946.5393
Total	**0.4699**	**3.9718**	**3.9866**	**0.0178**	**1.0918**	**0.0316**	**1.1233**	**0.2955**	**0.0300**	**0.3254**		**1,846.7551**	**1,846.7551**	**0.0993**		**1,849.2377**

3.5 Building Construction - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.0305	14.7882	13.1881	0.0220		0.7960	0.7960		0.7688	0.7688		2,001.1595	2,001.1595	0.3715		2,010.4467

Total	**2.0305**	**14.7882**	**13.1881**	**0.0220**		**0.7960**	**0.7960**		**0.7688**	**0.7688**		**2,001.1595**	**2,001.1595**	**0.3715**		**2,010.4467**

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	0.1054	3.4379	0.9074	8.2200e-003	0.2109	0.0179	0.2288	0.0607	0.0172	0.0778		894.7255	894.7255	0.0724		896.5346
Worker	0.3228	0.2034	2.7495	9.1800e-003	0.9389	6.2100e-003	0.9451	0.2490	5.7200e-003	0.2547		915.6366	915.6366	0.0209		916.1585
Total	**0.4282**	**3.6412**	**3.6569**	**0.0174**	**1.1498**	**0.0242**	**1.1739**	**0.3097**	**0.0229**	**0.3326**		**1,810.3621**	**1,810.3621**	**0.0932**		**1,812.6930**

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	2.0305	14.7882	13.1881	0.0220		0.7960	0.7960		0.7688	0.7688	0.0000	2,001.1595	2,001.1595	0.3715		2,010.4467
Total	**2.0305**	**14.7882**	**13.1881**	**0.0220**		**0.7960**	**0.7960**		**0.7688**	**0.7688**	**0.0000**	**2,001.1595**	**2,001.1595**	**0.3715**		**2,010.4467**

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	0.1054	3.4379	0.9074	8.2200e-003	0.2018	0.0179	0.2198	0.0585	0.0172	0.0756		894.7255	894.7255	0.0724		896.5346
Worker	0.3228	0.2034	2.7495	9.1800e-003	0.8900	6.2100e-003	0.8962	0.2370	5.7200e-003	0.2427		915.6366	915.6366	0.0209		916.1585
Total	**0.4282**	**3.6412**	**3.6569**	**0.0174**	**1.0918**	**0.0242**	**1.1159**	**0.2955**	**0.0229**	**0.3183**		**1,810.3621**	**1,810.3621**	**0.0932**		**1,812.6930**

3.6 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	9.4112					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		282.0423
Total	**9.6776**	**1.8354**	**1.8413**	**2.9700e-003**		**0.1288**	**0.1288**		**0.1288**	**0.1288**		**281.4481**	**281.4481**	**0.0238**		**282.0423**

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	0.0701	0.0459	0.6065	1.9200e-003	0.1900	1.2700e-003	0.1913	0.0504	1.1700e-003	0.0516		191.4439	191.4439	4.7100e-003		191.5615
Total	**0.0701**	**0.0459**	**0.6065**	**1.9200e-003**	**0.1900**	**1.2700e-003**	**0.1913**	**0.0504**	**1.1700e-003**	**0.0516**		**191.4439**	**191.4439**	**4.7100e-003**		**191.5615**

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	9.4112					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		282.0423
Total	**9.6776**	**1.8354**	**1.8413**	**2.9700e-003**		**0.1288**	**0.1288**		**0.1288**	**0.1288**	**0.0000**	**281.4481**	**281.4481**	**0.0238**		**282.0423**

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	0.0701	0.0459	0.6065	1.9200e-003	0.1801	1.2700e-003	0.1814	0.0480	1.1700e-003	0.0491		191.4439	191.4439	4.7100e-003		191.5615
Total	**0.0701**	**0.0459**	**0.6065**	**1.9200e-003**	**0.1801**	**1.2700e-003**	**0.1814**	**0.0480**	**1.1700e-003**	**0.0491**		**191.4439**	**191.4439**	**4.7100e-003**		**191.5615**

3.6 Architectural Coating - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	9.4112					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2422	1.6838	1.8314	2.9700e-003		0.1109	0.1109		0.1109	0.1109		281.4481	281.4481	0.0218		281.9928
Total	**9.6534**	**1.6838**	**1.8314**	**2.9700e-003**		**0.1109**	**0.1109**		**0.1109**	**0.1109**		**281.4481**	**281.4481**	**0.0218**		**281.9928**

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	0.0653	0.0412	0.5565	1.8600e-003	0.1900	1.2600e-003	0.1913	0.0504	1.1600e-003	0.0516		185.3074	185.3074	4.2200e-003		185.4130
Total	**0.0653**	**0.0412**	**0.5565**	**1.8600e-003**	**0.1900**	**1.2600e-003**	**0.1913**	**0.0504**	**1.1600e-003**	**0.0516**		**185.3074**	**185.3074**	**4.2200e-003**		**185.4130**

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	9.4112					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Off-Road	0.2422	1.6838	1.8314	2.9700e-003		0.1109	0.1109		0.1109	0.1109	0.0000	281.4481	281.4481	0.0218		281.9928
Total	**9.6534**	**1.6838**	**1.8314**	**2.9700e-003**		**0.1109**	**0.1109**		**0.1109**	**0.1109**	**0.0000**	**281.4481**	**281.4481**	**0.0218**		**281.9928**

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	0.0653	0.0412	0.5565	1.8600e-003	0.1801	1.2600e-003	0.1814	0.0480	1.1600e-003	0.0491		185.3074	185.3074	4.2200e-003		185.4130
Total	**0.0653**	**0.0412**	**0.5565**	**1.8600e-003**	**0.1801**	**1.2600e-003**	**0.1814**	**0.0480**	**1.1600e-003**	**0.0491**		**185.3074**	**185.3074**	**4.2200e-003**		**185.4130**

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	0.3136	1.2495	4.0470	0.0144	1.2297	0.0141	1.2438	0.3288	0.0132	0.3421		1,460.0465	1,460.0465	0.0616		1,461.5872
Unmitigated	0.3136	1.2495	4.0470	0.0144	1.2297	0.0141	1.2438	0.3288	0.0132	0.3421		1,460.0465	1,460.0465	0.0616		1,461.5872

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
University/College (4Yr)	193.00	193.00	0.00	496,929	496,929
Total	193.00	193.00	0.00	496,929	496,929

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)	16.60	8.40	6.90	6.40	88.60	5.00	91	9	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
University/College (4Yr)	0.555968	0.043848	0.210359	0.116378	0.016765	0.005795	0.025008	0.016160	0.001677	0.001586	0.004867	0.000586	0.001002

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

Exceed Title 24

Install High Efficiency Lighting

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0789	0.7170	0.6022	4.3000e-003		0.0545	0.0545		0.0545	0.0545		860.3384	860.3384	0.0165	0.0158	865.4510

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
NaturalGas Unmitigated	0.0909	0.8262	0.6940	4.9600e-003		0.0628	0.0628		0.0628	0.0628		991.4585	991.4585	0.0190	0.0182	997.3502

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)	8427.4	0.0909	0.8262	0.6940	4.9600e-003		0.0628	0.0628		0.0628	0.0628		991.4585	991.4585	0.0190	0.0182	997.3502
Total		**0.0909**	**0.8262**	**0.6940**	**4.9600e-003**		**0.0628**	**0.0628**		**0.0628**	**0.0628**		**991.4585**	**991.4585**	**0.0190**	**0.0182**	**997.3502**

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)	7.31288	0.0789	0.7170	0.6022	4.3000e-003		0.0545	0.0545		0.0545	0.0545		860.3384	860.3384	0.0165	0.0158	865.4510
Total		**0.0789**	**0.7170**	**0.6022**	**4.3000e-003**		**0.0545**	**0.0545**		**0.0545**	**0.0545**		**860.3384**	**860.3384**	**0.0165**	**0.0158**	**865.4510**

6.0 Area Detail

6.1 Mitigation Measures Area

Use Low VOC Paint - Non-Residential Interior

Use Low VOC Paint - Non-Residential Exterior

Use Low VOC Cleaning Supplies

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	lb/day										lb/day					
Mitigated	4.4699	1.9000e-004	0.0206	0.0000		7.0000e-005	7.0000e-005		7.0000e-005	7.0000e-005		0.0438	0.0438	1.2000e-004		0.0467
Unmitigated	4.4699	1.9000e-004	0.0206	0.0000		7.0000e-005	7.0000e-005		7.0000e-005	7.0000e-005		0.0438	0.0438	1.2000e-004		0.0467

6.2 Area by SubCategory

Unmitigated

SubCategory	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	lb/day										lb/day					
Architectural Coating	0.5080					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	3.9600					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	1.9300e-003	1.9000e-004	0.0206	0.0000		7.0000e-005	7.0000e-005		7.0000e-005	7.0000e-005		0.0438	0.0438	1.2000e-004		0.0467
Total	**4.4699**	**1.9000e-004**	**0.0206**	**0.0000**		**7.0000e-005**	**7.0000e-005**		**7.0000e-005**	**7.0000e-005**		**0.0438**	**0.0438**	**1.2000e-004**		**0.0467**

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	0.5080					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	3.9600					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	1.9300e-003	1.9000e-004	0.0206	0.0000		7.0000e-005	7.0000e-005		7.0000e-005	7.0000e-005		0.0438	0.0438	1.2000e-004		0.0467
Total	**4.4699**	**1.9000e-004**	**0.0206**	**0.0000**		**7.0000e-005**	**7.0000e-005**		**7.0000e-005**	**7.0000e-005**		**0.0438**	**0.0438**	**1.2000e-004**		**0.0467**

7.0 Water Detail

7.1 Mitigation Measures Water

Install Low Flow Bathroom Faucet

Install Low Flow Kitchen Faucet

Install Low Flow Toilet

Install Low Flow Shower

8.0 Waste Detail

8.1 Mitigation Measures Waste

Institute Recycling and Composting Services

9.0 Operational Offroad

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

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type
Emergency Generator	1	0	8	2600	0.73	Diesel

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

10.1 Stationary Sources

Unmitigated/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
Equipment Type	lb/day										lb/day					
Emergency Generator - Diesel (750 - 9999 HP)	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

11.0 Vegetation

APPENDIX B

Greenhouse Gas Assessment

Greenhouse Gas Assessment

UCI Interdisciplinary Sciences Building Project

CONSULTANT:

Michael Baker International
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GREENHOUSE GAS ASSESSMENT

for the

UCI Interdisciplinary Sciences Building Project

University of California, Irvine

Consultant:

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July 20, 2017

JN 159093

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SYMBOLS, ABBREVIATIONS, AND ACRONYMS

AB	Assembly Bill
AQMP	Air Quality Management Plan
Basin	South Coast Air Basin
BAU	business as usual
CAAQS	California Ambient Air Quality Standards
CAFE	corporate average fleet fuel economy
CalGreen	California Green Building Standards
CARB	California Air Resources Board
CCAA	California Clean Air Act
CEQA	California Environmental Quality Act
CFCs	Chlorofluorocarbons
CH_4	Methane
CO	carbon monoxide
CO_2	carbon dioxide
CO_2eq	carbon dioxide equivalent
EAP	Energy Action Plan
EECAP	energy efficiency climate action plans
EPA	U.S. Environmental Protection Agency
FCAA	Federal Clean Air Act
GHG	greenhouse gas
GSF	gross square foot
GWP	Global Warming Potential
H_2O	water vapor
HCFCs	Hydrochlorofluorocarbons
HFCs	Hydrofluorocarbons
hp	horsepower
HPLV	high-pressure-low-volume
HVAC	heating, ventilation, and air conditioning
I-4	Environmental Justice Enhancement Initiative
IPCC	International Panel for Climate Change
lbs	pounds
LEED	Leadership in Engineering and Environmental Design
LOS	level of service
LSTs	Localized Significance Thresholds
Metro	Los Angeles County Metropolitan Transportation Authority
MMT	million metric tons
mpg	miles per gallon
MPO	metropolitan planning organization
$MTCO_2eq$	metric tons of carbon dioxide equivalents
MU-T	Mixed-Use Transit
N_2O	nitrous oxide

NAAQS	National Ambient Air Quality Standards
NO_2	nitrogen dioxide
NO_x	nitrogen oxides
OAL	Office of Administrative Law
O_3	ozone
OPR	Office of Planning and Research
PFCs	Perfluorocarbons
PM_{10}	particulate matter less than 10 microns in diameter
$PM_{2.5}$	particulate matter less than 2.5 microns in diameter
ppm	parts per million
PST	Pacific Standard Time
RCP	Regional Comprehensive Plan
RH	relative humidity
ROG	Reactive Organic Gasses
RTP	Regional Transportation Plan
SB	Senate Bill
SCAG	Southern California Association of Governments
SCAQMD	South Coast Air Quality Management District
SCE	Southern California Edison
SCS	Sustainable Community Strategy
SF_6	Sulfur hexafluoride
SGVCOG	San Gabriel Valley Council of Governments
SGVEWP	San Gabriel Valley Energy Wise Partnership
SIP	State Implementation Plan
SO_2	sulfur dioxide
SO_x	sulfur oxides
SRA	Source receptor Area
UNFCCC	United Nations Framework Convention on Climate Change
$\mu g/m^3$	micrograms per cubic meter
UV-B	ultraviolet B rays
VMT	vehicle miles traveled
VOC	Volatile Organic Compound

EXECUTIVE SUMMARY

The purpose of this Greenhouse Gas Assessment is to evaluate potential short- and long-term greenhouse gas (GHG) impacts resulting from implementation of the proposed Interdisciplinary Sciences Building (ISB) Project ("project" or "proposed project") on the University of California, Irvine (UCI) campus. The project is located at the southwest corner of the Ring Mall near the intersection of East Peltason Drive and South Circle View Drive, on the UCI campus.

The project proposes to demolish an existing 160,000-gross-square-foot (GSF) parking lot to construct up to a 200,000 GSF, eight-story structure on an approximately 3.5-acre site. Construction will start in early 2018, lasting over 24 months. It is expected that the campus population will encompass relatively 70 faculty and 200 student researchers and staff. The ISB will contain a wet laboratory, an office, a shared auditorium for instruction, a building support and storage area, and shell space.

<u>Greenhouse Gas Impacts</u>. The proposed project would result in less than significant GHG impacts. Additionally, the project would not conflict with a plan, policy, or regulation adopted for the purposes of reducing GHG emissions.

1.0 INTRODUCTION

The purpose of this Greenhouse Gas Assessment is to evaluate potential short- and long-term air quality impacts resulting from implementation of the proposed Interdisciplinary Sciences Building (ISB) Project ("project" or "proposed project") on the University of California, Irvine (UCI) campus.

1.1 PROJECT LOCATION

The project site is located 0.85 miles east of State Route 73 (SR-73) and 2.13 miles south of Interstate 405 (I-405); refer to Exhibit 1, *Regional Vicinity*. Locally, the project is located at the southwest corner of the Ring Mall near the intersection of East Peltason Drive and South Circle View Drive, on the UCI campus; refer to Exhibit 2, *Site Vicinity*.

The project site, is located southwest of the Physical Sciences Lecture Hall and Physical Sciences Classroom Building, northwest of the Multipurpose Science and Technology Building, east of the University Club and southeast of Croul Hall on the UCI campus. On-campus residential, Campus Village student housing, lies northeast across Bison Avenue; Middle Earth student housing lies to the northeast; University Hills staff and faculty housing lies to the southeast.

1.2 PROJECT DESCRIPTION

The project proposes to demolish an existing 160,000-gross-square-foot (GSF) parking lot to construct up to a 200,000 GSF, eight-story structure on an approximately 3.5-acre site); refer to Exhibit 3, *Site Development Plan*. Construction would start in early 2018, lasting over 24 months. It is expected that the campus population would encompass up to 70 faculty and 200 student researchers and staff. The ISB would contain a wet laboratory, an office, a shared auditorium for instruction, a building support and storage area, and shell space.

Project Site

not to scale

UCI INTERDISCIPLINARY SCIENCE BUILDING PROJECT • GREENHOUSE GAS ASSESSMENT

Regional Vicinity

Michael Baker INTERNATIONAL

07/13/17 JN161093 MAS

Exhibit 1

Source: Aerial - Google Earth Pro, July 2017

Michael Baker INTERNATIONAL

not to scale

07/13/17 JN161093 MAS

UCI INTERDISCIPLINARY SCIENCE BUILDING PROJECT • GREENHOUSE GAS ASSESSMENT

Site Vicinity

Exhibit 2

Source: HKS 2016

Michael Baker INTERNATIONAL
03/21/16 JN152595-21602 MAS

UCI INTERDISCIPLINARY SCIENCE BUILDING PROJECT
GREENHOUSE GAS ASSESSMENT

Site Development Plan

Exhibit 3

2.0 ENVIRONMENTAL SETTING

The California Air Resources Board (CARB) divides the State into 15 air basins that share similar meteorological and topographical features. The project site lies within the northwestern portion of the South Coast Air Basin (Basin). The Basin is a 6,600-square mile area bounded by the Pacific Ocean to the west and the San Gabriel, San Bernardino, and San Jacinto Mountains to the north and east. The Basin includes all of Orange County and the non-desert portions of Los Angeles, Riverside, and San Bernardino Counties, in addition to the San Gorgonio Pass area in Riverside County. The Basin's terrain and geographical location (i.e., a coastal plain with connecting broad valleys and low hills) determine its distinctive climate.

The general region lies in the semi-permanent high-pressure zone of the eastern Pacific. The climate is mild and tempered by cool sea breezes. The usually mild climatological pattern is interrupted infrequently by periods of extremely hot weather, winter storms, or Santa Ana winds. The extent and severity of the air pollution problem in the Basin is a function of the area's natural physical characteristics (weather and topography), as well as man-made influences (development patterns and lifestyle). Factors such as wind, sunlight, temperature, humidity, rainfall, and topography all affect the accumulation and/or dispersion of pollutants throughout the Basin.

CLIMATE

The average annual temperature varies little throughout the Basin, averaging 75 degrees Fahrenheit (°F). However, with a less-pronounced oceanic influence, the eastern inland portions of the Basin show greater variability in annual minimum and maximum temperatures. All portions of the Basin have had recorded temperatures over 100°F in recent years.

Although the Basin has a semi-arid climate, the air near the surface is moist due to the presence of a shallow marine layer. Except for infrequent periods when dry, continental air is brought into the Basin by offshore winds, the ocean effect is dominant. Periods with heavy fog are frequent, and low stratus clouds, occasionally referred to as "high fog," are a characteristic climate feature. Annual average relative humidity is 70 percent at the coast and 57 percent in the eastern part of the Basin. Precipitation in the Basin is typically nine to 14 inches annually and is rarely in the form of snow or hail due to typically warm weather. The frequency and amount of rainfall is greater in the coastal areas of the Basin.

The height of the inversion is important in determining pollutant concentration. When the inversion is approximately 2,500 feet above sea level, the sea breezes carry the pollutants inland to escape over the mountain slopes or through the passes. At a height of 1,200 feet, the terrain prevents the pollutants from entering the upper atmosphere, resulting in a settlement in the foothill communities. Below 1,200 feet, the inversion puts a tight lid on pollutants, concentrating them in a shallow layer over the entire coastal basin. Usually, inversions are lower before sunrise than during the day. Mixing heights for inversions are lower in the summer and more persistent, being partly responsible for the high levels of ozone (O_3) observed during summer months in the

Basin. Smog in southern California is generally the result of these temperature inversions combining with coastal day winds and local mountains to contain the pollutants for long periods of time, allowing them to form secondary pollutants by reacting with sunlight. The Basin has a limited ability to disperse these pollutants due to typically low wind speeds.

The area in which the project is located offers clear skies and sunshine, yet is still susceptible to air inversions. These inversions trap a layer of stagnant air near the ground, where it is then further loaded with pollutants. These inversions cause haziness, which is caused by moisture, suspended dust, and a variety of chemical aerosols emitted by trucks, automobiles, furnaces, and other sources.

3.0 STATE AND FEDERAL GREENHOUSE GAS STANDARDS

3.1 GLOBAL CLIMATE CHANGE GASES

The natural process through which heat is retained in the troposphere is called the "greenhouse effect."[1] The greenhouse effect traps heat in the troposphere through a threefold process as follows: Short wave radiation emitted by the Sun is absorbed by the Earth; the Earth emits a portion of this energy in the form of long wave radiation; and GHGs in the upper atmosphere absorb this long wave radiation and emit this long wave radiation into space and toward the Earth. This "trapping" of the long wave (thermal) radiation emitted back toward the Earth is the underlying process of the greenhouse effect.

The most abundant GHGs are water vapor and carbon dioxide (CO_2). Many other trace gases have greater ability to absorb and re-radiate long wave radiation; however, these gases are not as plentiful. For this reason, and to gauge the potency of GHGs, scientists have established a Global Warming Potential (GWP) for each GHG based on its ability to absorb and re-radiate long wave radiation.

GHGs include, but are not limited to, the following:[2]

- *Water Vapor (H_2O)*. Although water vapor has not received the scrutiny of other GHGs, it is the primary contributor to the greenhouse effect. Natural processes, such as evaporation from oceans and rivers, and transpiration from plants, contribute 90 percent and 10 percent of the water vapor in our atmosphere, respectively.

  The primary human related source of water vapor comes from fuel combustion in motor vehicles; however, this is not believed to contribute a significant amount (less than one percent) to atmospheric concentrations of water vapor. The Intergovernmental Panel on Climate Change (IPCC) has not determined a GWP for water vapor.

- *Carbon Dioxide (CO_2)*. Carbon Dioxide is primarily generated by fossil fuel combustion in stationary and mobile sources. Due to the emergence of industrial facilities and mobile sources in the past 250 years, CO_2 emissions from fossil fuel combustion increased by a total of 7.4 percent between 1990 and 2014.[3] Carbon dioxide is the most widely emitted GHG and is the reference gas (GWP of 1) for determining GWPs for other GHGs.

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[1] The troposphere is the bottom layer of the atmosphere, which varies in height from the Earth's surface to 10 to 12 kilometers.

[2] All Global Warming Potentials are given as 100-year Global Warming Potential. Unless noted otherwise, all Global Warming Potentials were obtained from the IPCC. (Intergovernmental Panel on Climate Change, *Climate Change, Climate Change 2007: Synthesis Report. Contribution of Working Groups I, II and III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, 2007*).

[3] U.S. Environmental Protection Agency, *Inventory of United States Greenhouse Gas Emissions and Sinks 1990 to 2014*, April 2016.

- *Methane (CH_4)*. Methane is emitted from biogenic sources, incomplete combustion in forest fires, landfills, manure management, and leaks in natural gas pipelines. In the United States, the top three sources of methane are landfills, natural gas systems, and enteric fermentation (the digestive process in animals with a rumen, typically cattle, causing methane gas). Methane is the primary component of natural gas, which is used for space and water heating, steam production, and power generation. The GWP of methane is 25.

- *Nitrous Oxide (N_2O)*. Nitrous oxide is produced by both natural and human related sources. Primary human related sources include agricultural soil management, animal manure management, sewage treatment, mobile and stationary combustion of fossil fuel, adipic acid production (for the industrial production of nylon), and nitric acid production (for rocket fuel, woodworking, and as a chemical reagent). The GWP of nitrous oxide is 298.

- *Hydrofluorocarbons (HFCs)*. HFCs are typically used as refrigerants, aerosol propellants, solvents and fire retardants. The major emissions source of HFCs is from their use as refrigerants in air conditioning systems in both vehicles and buildings. The use of HFCs for cooling and foam blowing is increasing, as the continued phase out of chlorofluorocarbons (CFCs) and HCFCs gains momentum. The 100-year GWP of HFCs range from 12 for HFC-161 to 14,800 for HFC-23.[4]

- *Perfluorocarbons (PFCs)*. PFCs are compounds consisting of carbon and fluorine, and are primarily created as a byproduct of aluminum production and semiconductor manufacturing. Perfluorocarbons are potent GHGs with a GWP several thousand times that of carbon dioxide, depending on the specific PFC. Another area of concern regarding PFCs is their long atmospheric lifetime (up to 50,000 years).[5] The GWP of PFCs range from 7,390 to 12,200.[6]

- *Sulfur hexafluoride (SF_6)*. SF_6 is a colorless, odorless, nontoxic, nonflammable gas. Sulfur hexafluoride is the most potent GHG that has been evaluated by the IPCC with a Global Warming Potential of 22,800.[7] However, its global warming contribution is not as high as the Global Warming Potential would indicate due to its low mixing ratio compared to carbon dioxide (4 parts per trillion [ppt] in 1990 versus 365 parts per million [ppm], respectively).[8]

[4] Ibid.

[5] U.S. Environmental Protection Agency, *Overview of Greenhouse Gas Emissions*, April 14, 2017, https://www.epa.gov/ghgemissions/overview-greenhouse-gases#f-gases, accessed on July 17, 2017.

[6] Ibid.

[7] Ibid.

[8] Ibid.

In addition to the six major GHGs discussed above (excluding water vapor), many other compounds have the potential to contribute to the greenhouse effect. Some of these substances were previously identified as stratospheric ozone (O_3) depletors; therefore, their gradual phase out is currently in effect. The following is a listing of these compounds:

- *Hydrochlorofluorocarbons (HCFCs)*. HCFCs are solvents, similar in use and chemical composition to CFCs. The main uses of HCFCs are for refrigerant products and air conditioning systems. As part of the Montreal Protocol, all developed countries that adhere to the Montreal Protocol are subject to a consumption cap and gradual phase out of HCFCs. The United States is scheduled to achieve a 100 percent reduction to the cap by 2030. The 100-year GWP of HCFCs range from 90 for HCFC-123 to 1,800 for HCFC-142b.[9]

- *1,1,1 trichloroethane*. 1,1,1 trichloroethane or methyl chloroform is a solvent and degreasing agent commonly used by manufacturers. The GWP of methyl chloroform is 146 times that of CO_2 (CO_2 has a GWP of 1).[10]

- *Chlorofluorocarbons (CFCs)*. CFCs are used as refrigerants, cleaning solvents, and aerosols spray propellants. CFCs were also part of the EPA's Final Rule (57 FR 3374) for the phase out of O_3 depleting substances. Currently, CFCs have been replaced by HFCs in cooling systems and a variety of alternatives for cleaning solvents. Nevertheless, CFCs remain suspended in the atmosphere contributing to the greenhouse effect. CFCs are potent GHGs with 100-year GWPs ranging from 3,800 for CFC 11 to 14,400 for CFC 13.[11]

[9] Intergovernmental Panel on Climate Change, *Climate Change 2007: Working Group I: The Physical Science Basis, 2.10.2, Direct Global Warming Potentials*, 2007, https://www.ipcc.ch/publications_and_data/ar4/wg1/en/ch2s2-10-2.html, accessed July 17, 2017.

[10] Ibid.

[11] Ibid.

4.0 REGULATORY SETTING

4.1 GLOBAL CLIMATE CHANGE REGULATORY PROGRAMS

FEDERAL

The Federal government is extensively engaged in international climate change activities in areas such as science, mitigation, and environmental monitoring. The EPA actively participates in multilateral and bilateral activities by establishing partnerships and providing leadership and technical expertise. Multilaterally, the United States is a strong supporter of activities under the United Nations Framework Convention on Climate Change (UNFCCC) and the IPCC.

In 1988, the United Nations and the World Meteorological Organization established the IPCC to assess the scientific, technical, and socioeconomic information relevant to understanding the scientific basis of human-induced climate change, its potential impacts, and options for adaptation and mitigation. The most recent reports of the IPCC have emphasized the scientific consensus around the evidence that real and measurable changes to the climate are occurring, that they are caused by human activity, and that significant adverse impacts on the environment, the economy, and human health and welfare are unavoidable.

In December 2007, Congress passed the first increase in corporate average fleet fuel economy (CAFE) standards. The new CAFE standards represent an increase to 35 miles per gallon (mpg) by 2020. In March 2009, the Obama Administration announced that for the 2011 model year, the standard for cars and light trucks will be 27.3 mpg, the standard for cars will be 30.2 mpg; and standard for trucks would be 24.1 mpg. Additionally, in May 2009 President Barack Obama announced plans for a national fuel-economy and GHG emissions standard that would significantly increase mileage requirements for cars and trucks by 2016. The new requirements represent an average standard of 39 mpg for cars and 30 mpg for trucks by 2016.

Currently, the EPA is moving forward with two key climate change regulatory proposals, one to establish a mandatory GHG reporting system. Under the Federal Clean Air Act (FCAA), the EPA is now obligated to issue rules regulating global warming pollution from all major sources. In April 2009, the EPA concluded that GHGs are a danger to public health and welfare, establishing the basis for GHG regulation. However, as of the date of this study there are no Federal regulations or policies regarding GHG emissions applicable to the proposed project.

STATE

Various statewide and local initiatives to reduce California's contribution to GHG emissions have raised awareness that, even though the various contributors to and consequences of global climate change are not yet fully understood, global climate change is occurring, and that there is a real potential for severe adverse environmental, social, and economic effects in the long term. Every nation emits GHGs and as a result makes an incremental cumulative contribution to global climate change; therefore, global cooperation will be required to reduce the rate of GHG emissions enough to slow or stop the human-caused increase in average global temperatures and associated changes in climatic conditions.

Executive Order S-1-07. Executive Order S-1-07 proclaims that the transportation sector is the main source of GHG emissions in California, generating more than 40 percent of statewide emissions. It establishes a goal to reduce the carbon intensity of transportation fuels sold in California by at least ten percent by 2020. This order also directs CARB to determine whether this Low Carbon Fuel Standard (LCFS) could be adopted as a discrete early-action measure as part of the effort to meet the mandates in AB 32.

Executive Order S-3-05. Executive Order S-3-05 set forth a series of target dates by which statewide emissions of GHGs would be progressively reduced, as follows:

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

The Executive Order directed the secretary of the California Environmental Protection Agency (Cal/EPA) to coordinate a multi-agency effort to reduce GHG emissions to the target levels. The secretary will also submit biannual reports to the governor and California Legislature describing the progress made toward the emissions targets, the impacts of global climate change on California's resources, and mitigation and adaptation plans to combat these impacts. To comply with the executive order, the secretary of Cal/EPA created the California Climate Action Team (CAT), made up of members from various State agencies and commissions. The team released its first report in March 2006. The report proposed to achieve the targets by building on the voluntary actions of California businesses, local governments, and communities and through State incentive and regulatory programs.

Executive Order B-30-15. Executive Order B-30-15 added the interim target to reduce statewide GHG emissions 40 percent below 1990 levels by 2030.

Executive Order S-13-08. Executive Order S-13-08 seeks to enhance the State's management of climate impacts including sea level rise, increased temperatures, shifting precipitation, and extreme weather events by facilitating the development of State's first climate adaptation strategy. This will result in consistent guidance from experts on how to address climate change impacts in the State of California.

Executive Order S-14-08. Executive Order S-14-08 expands the State's Renewable Energy Standard to 33 percent renewable power by 2020. Additionally, Executive Order S-21-09 (signed on September 15, 2009) directs CARB to adopt regulations requiring 33 percent of electricity sold in the State come from renewable energy by 2020. CARB adopted the "Renewable Electricity

Standard" on September 23, 2010, which requires 33 percent renewable energy by 2020 for most publicly owned electricity retailers.

Executive Order S-20-04. Executive Order S-20-04, the California Green Building Initiative, (signed into law on December 14, 2004), establishes a goal of reducing energy use in State-owned buildings by 20 percent from a 2003 baseline by 2015. It also encourages the private commercial sector to set the same goal. The initiative places the California Energy Commission (CEC) in charge of developing a building efficiency benchmarking system, commissioning and retro-commissioning (commissioning for existing commercial buildings) guidelines, and developing and refining building energy efficiency standards under Title 24 to meet this goal.

Executive Order S-21-09. Executive Order S-21-09, 33 percent Renewable Energy for California, directs CARB to adopt regulations to increase California's Renewable Portfolio Standard (RPS) to 33 percent by 2020. This builds upon SB 1078 (2002) which established the California RPS program, requiring 20 percent renewable energy by 2017, and SB 107 (2006) which advanced the 20 percent deadline to 2010, a goal which was expanded to 33 percent by 2020 in the 2005 Energy Action Plan II.

Assembly Bill 32 (California Global Warming Solutions Act of 2006). California passed the California Global Warming Solutions Act of 2006 (AB 32; *California Health and Safety Code* Division 25.5, Sections 38500 - 38599). AB 32 establishes regulatory, reporting, and market mechanisms to achieve quantifiable reductions in GHG emissions and establishes a cap on statewide GHG emissions. AB 32 requires that statewide GHG emissions be reduced to 1990 levels by 2020. AB 32 specifies that regulations adopted in response to AB 1493 should be used to address GHG emissions from vehicles. However, AB 32 also includes language stating that if the AB 1493 regulations cannot be implemented, then CARB should develop new regulations to control vehicle GHG emissions under the authorization of AB 32.

Assembly Bill 1493. AB 1493 (also known as the Pavley Bill) requires that CARB develop and adopt, by January 1, 2005, regulations that achieve "the maximum feasible reduction of GHG emitted by passenger vehicles and light-duty trucks and other vehicles determined by CARB to be vehicles whose primary use is noncommercial personal transportation in the State."

To meet the requirements of AB 1493, CARB approved amendments to the California Code of Regulations (CCR) in 2004 by adding GHG emissions standards to California's existing standards for motor vehicle emissions. Amendments to CCR Title 13, Sections 1900 and 1961 and adoption of 13 CCR Section 1961.1 require automobile manufacturers to meet fleet-average GHG emissions limits for all passenger cars, light-duty trucks within various weight criteria, and medium-duty weight classes for passenger vehicles (i.e., any medium-duty vehicle with a gross vehicle weight rating less than 10,000 pounds that is designed primarily to transport people), beginning with the 2009 model year. Emissions limits are reduced further in each model year through 2016. When fully phased in, the near-term standards will result in a reduction of about 22 percent in GHG emissions compared to the emissions from the 2002 fleet, while the mid-term standards will result in a reduction of about 30 percent.

Assembly Bill 3018. AB 3018 established the Green Collar Jobs Council (GCJC) under the California Workforce Investment Board (CWIB). The GCJC will develop a comprehensive approach to address California's emerging workforce needs associated with the emerging green economy. This bill will ignite the development of job training programs in the clean and green technology sectors.

Senate Bill 97. SB 97, signed in August 2007 (Chapter 185, Statutes of 2007; PRC Sections 21083.05 and 21097), acknowledges that climate change is a prominent environmental issue that requires analysis under CEQA. This bill directs the Governor's Office of Planning and Research (OPR), which is part of the State Natural Resources Agency, to prepare, develop, and transmit to CARB guidelines for the feasible mitigation of GHG emissions (or the effects of GHG emissions), as required by CEQA.

OPR published a technical advisory recommending that CEQA lead agencies make a good-faith effort to estimate the quantity of GHG emissions that would be generated by a proposed project. Specifically, based on available information, CEQA lead agencies should estimate the emissions associated with project-related vehicular traffic, energy consumption, water usage, and construction activities to determine whether project-level or cumulative impacts could occur, and should mitigate the impacts where feasible. OPR requested CARB technical staff to recommend a method for setting CEQA thresholds of significance as described in CEQA Guidelines Section 15064.7 that will encourage consistency and uniformity in the CEQA analysis of GHG emissions throughout the State.

The Natural Resources Agency adopted the CEQA Guidelines Amendments prepared by OPR, as directed by SB 97. On February 16, 2010, the Office of Administration Law approved the CEQA Guidelines Amendments, and filed them with the Secretary of State for inclusion in the California Code of Regulations. The CEQA Guidelines Amendments became effective on March 18, 2010.

Senate Bill 375. SB 375, signed in September 2008 (Chapter 728, Statutes of 2008), aligns regional transportation planning efforts, regional GHG reduction targets, and land use and housing allocation. SB 375 requires Metropolitan Planning Organizations (MPOs) to adopt a sustainable communities strategy (SCS) or alternative planning strategy (APS) that will prescribe land use allocation in that MPOs regional transportation plan. CARB, in consultation with MPOs, will provide each affected region with reduction targets for GHGs emitted by passenger cars and light trucks in the region for the years 2020 and 2035. These reduction targets will be updated every eight years but can be updated every four years if advancements in emissions technologies affect the reduction strategies to achieve the targets. CARB is also charged with reviewing each MPO's SCS or APS for consistency with its assigned targets. If MPOs do not meet the GHG reduction targets, transportation projects may not be eligible for funding programmed after January 1, 2012.

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

Senate Bill 1368. SB 1368 (Chapter 598, Statutes of 2006) is the companion bill of AB 32 and was signed into law in September 2006. SB 1368 required the California Public Utilities Commission (CPUC) to establish a performance standard for baseload generation of GHG emissions by investor-owned utilities by February 1, 2007. SB 1368 also required the California Energy Commission (CEC) to establish a similar standard for local publicly owned utilities by June 30, 2007. These standards could not exceed the GHG emissions rate from a baseload combined-cycle, natural gas fired plant. Furthermore, the legislation states that all electricity provided to California, including imported electricity, must be generated by plants that meet the standards set by CPUC and CEC.

Senate Bill 32 (SB 32). Signed into law in September 2016, SB 32 codifies the 2030 GHG reduction target in Executive Order B-30-15 (40 percent below 1990 levels by 2030). The bill authorizes CARB to adopt an interim GHG emissions level target to be achieved by 2030. CARB also must adopt rules and regulations in an open public process to achieve the maximum, technologically feasible, and cost-effective GHG reductions.

CARB Scoping Plan

On December 11, 2008, CARB adopted its Scoping Plan, which functions as a roadmap to achieve GHG reductions in California required by AB 32 through subsequently enacted regulations. CARB's Scoping Plan contains the main strategies California will implement to reduce CO_2eq[12] emissions by 174 million metric tons (MT), or approximately 30 percent, from the State's projected 2020 emissions level of 596 million MT CO_2eq under a business as usual (BAU)[13] scenario. This is a reduction of 42 million MT CO_2eq, or almost ten percent, from 2002 to 2004 average emissions, but requires the reductions in the face of population and economic growth through 2020.

CARB's Scoping Plan calculates 2020 BAU emissions as the emissions that would be expected to occur in the absence of any GHG reduction measures. The 2020 BAU emissions estimate was derived by projecting emissions from a past baseline year using growth factors specific to each of the different economic sectors (e.g., transportation, electrical power, commercial and residential, industrial, etc.). CARB used three-year average emissions, by sector, for 2002 to 2004 to forecast emissions to 2020. At the time CARB's Scoping Plan process was initiated, 2004 was the most

[12] Carbon Dioxide Equivalent (CO_2eq) - A metric measure used to compare the emissions from various greenhouse gases based upon their global warming potential.

[13] "Business as Usual" refers to emissions that would be expected to occur in the absence of GHG reductions. See https://www.arb.ca.gov/cc/inventory/data/bau.htm. Note that there is significant controversy as to what BAU means. In determining the GHG 2020 limit, CARB used the above as the "definition." It is broad enough to allow for design features to be counted as reductions.

recent year for which actual data was available. The measures described in CARB's Scoping Plan are intended to reduce the projected 2020 BAU to 1990 levels, as required by AB 32.

AB 32 requires CARB to update the Scoping Plan at least once every five years. CARB adopted the first major update to the Scoping Plan on May 22, 2014. The updated Scoping Plan summarizes the most recent science related to climate change, including anticipated impacts to California and the levels of GHG reduction necessary to likely avoid risking irreparable damage. It identifies the actions California has already taken to reduce GHG emissions and focuses on areas where further reductions could be achieved to help meet the 2020 target established by AB 32. The Scoping Plan update also looks beyond 2020 toward the 2050 goal established in Executive Order S-3-05, though not yet adopted as state law, and observes that "a mid-term statewide emission limit will ensure that the State stays on course to meet our long-term goal." The Scoping Plan update does not establish or propose any specific post-2020 goals, but identifies such goals adopted by other governments or recommended by various scientific and policy organizations.

University of California, Irvine

UC Irvine Climate Action Plan

The UCI Climate Action Plan (CAP) was initially adopted in 2007 (updated in 2016) and has guided an array of climate action protection strategies and projects to reduce UCI GHG emissions. The CAP provides a roadmap for UCI to achieve its institutional climate protection commitments in support of University of California sustainability policy and campus sustainability goals. These commitments include reduction of GHG emissions to 1990 levels by the year 2020 (a reduction of approximately 49 percent from projected emissions), climate neutrality by the year 2025 (for on-site combustion of fossil fuels and purchased electricity), and climate neutrality by the year 2050 (for UCI commuters and University funded air travel).

University of California Sustainable Practices Policy

The University of California Sustainable Practices Policy (Sustainable Practices Policy) establishes goals in nine areas of sustainable practices: green building, clean energy, transportation, climate protection, sustainable operations, waste reduction and recycling, environmentally preferable purchasing, sustainable foodservice, sustainable water systems.

5.0 POTENTIAL GREENHOUSE GAS IMPACTS

CEQA THRESHOLDS

The environmental analysis in this section is patterned after the Initial Study Checklist recommended by the State *CEQA Guidelines*, as amended. The issues presented in the Initial Study Checklist have been utilized as thresholds of significance in this section. Accordingly, a project may create a significant environmental impact if it causes one or more of the following to occur:

- Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment (refer to Impact Statement GHG-1); and

- Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases (refer to Impact Statement GHG-2).

Based on these standards and thresholds, the effects of the proposed project have been categorized as either a "less than significant impact" or a "potentially significant impact." Mitigation measures are recommended for potentially significant impacts.

SCAQMD Greenhouse Gas Emissions Thresholds

At this time, there is no absolute consensus in the State of California among CEQA lead agencies regarding the analysis of global climate change and the selection of significance criteria. In fact, numerous organizations, both public and private, have released advisories and guidance with recommendations designed to assist decision-makers in the evaluation of GHG emissions given the current uncertainty regarding when emissions reach the point of significance. Lead agencies may elect to rely on thresholds of significance recommended or adopted by State or regional agencies with expertise in the field of global climate change. (See C*EQA Guidelines* Section 15064.7[c].)

The SCAQMD has formed a GHG CEQA Significance Threshold Working Group (Working Group) to provide guidance to local lead agencies on determining significance for GHG emissions in their CEQA documents. As of the last Working Group meeting (Meeting No. 15) held in September 2010, the SCAQMD is proposing to adopt a tiered approach for evaluating GHG emissions for development projects where SCAQMD is not the lead agency.[14]

With the tiered approach, the project is compared with the requirements of each tier sequentially and would not result in a significant impact if it complies with any tier. Tier 1 excludes projects that are specifically exempt from SB 97 from resulting in a significant impact. Tier 2 excludes

[14] The most recent SCAQMD GHG CEQA Significance Threshold Working Group meeting was held on September 2010.

projects that are consistent with a GHG reduction plan that has a certified final CEQA document and complies with AB 32 GHG reduction goals. Tier 3 excludes projects with annual emissions lower than a screening threshold. For all non-industrial projects, the SCAQMD is proposing a screening threshold of 3,000 $MTCO_2eq$ per year. SCAQMD concluded that projects with emissions less than the screening threshold would not result in a significant cumulative impact.

Tier 4 consists of three options. Under the Tier 4 first option, the project would be excluded if design features and/or mitigation measures resulted in emissions 30 percent lower than business as usual emissions. However, the Working Group did not provide a recommendation for this approach. The Working Group folded the Tier 4 second option into the third Option. Under the Under the Tier 4 third option, the project would be excluded if it was below an efficiency-based threshold of 4.8 $MTCO_2eq$ per service population (SP) per year.[15] Tier 5 would exclude projects that implement offsite mitigation (GHG reduction projects) or purchase offsets to reduce GHG emission impacts to less than the proposed screening level.

GHG efficiency metrics are utilized as thresholds to assess the GHG efficiency of a project on a per capita basis or on a "service population" basis (the sum of the number of jobs and the number of residents provided by a project) such that the project would allow for consistency with the goals of AB 32 (i.e., 1990 GHG emissions levels by 2020 and 2035). GHG efficiency thresholds can be determined by dividing the GHG emissions inventory goal of the State, by the estimated 2035 population and employment. This method allows highly efficient projects with higher mass emissions to meet the overall reduction goals of AB 32, and is appropriate, because the threshold can be applied evenly to all project types (residential or commercial/retail only and mixed use).

As the project involves up to an estimated 200,000 GSF building on the UCI campus, SCAQMD's 3,000 $MTCO_2eq$ per year screening threshold has been selected as the significance threshold, as it is most applicable to the proposed project. The 3,000 $MTCO_2eq$ per threshold is used in addition to the qualitative thresholds of significance set forth below from section VII of Appendix G to the CEQA Guidelines.

[15] The project-level efficiency-based threshold of 4.8 $MTCO_2eq$ per SP per year is relative to the 2020 target date. The SCAQMD has also proposed efficiency-based thresholds relative to the 2035 target date to be consistent with the GHG reduction target date of SB 375. GHG reductions by the SB 375 target date of 2035 would be approximately 40 percent. Applying this 40 percent reduction to the 2020 targets results in an efficiency threshold for plans of 4.1 $MTCO_2eq$ per SP per year and an efficiency threshold at the project level of 3.0 $MTCO_2eq$/year.

PROJECT RELATED SOURCES OF GREENHOUSE GASES

GHG-1 GENERATE GREENHOUSE GAS EMISSIONS, EITHER DIRECTLY OR INDIRECTLY, THAT MAY HAVE A SIGNIFICANT IMPACT ON THE ENVIRONMENT?

Level of Significance Before Mitigation: *Less Than Significant Impact.*

Project-related GHG emissions would include emissions from direct and indirect sources. The proposed project would result in direct and indirect emissions of CO_2, N_2O, and CH_4, and would not result in other GHGs that would facilitate a meaningful analysis. Therefore, this analysis focuses on these three forms of GHG emissions. Direct project-related GHG emissions include emissions from construction activities, area sources, and mobile sources, while indirect sources include emissions from electricity consumption, water demand, and solid waste generation. Operational GHG estimations are based on energy emissions from natural gas usage and automobile emissions. Project GHG emissions were calculated using the California Emissions Estimator Model (CalEEMod) version 2016.3.1, which relies on trip generation data, and specific land use information to calculate emissions. As indicated in the *UCI Interdisciplinary Science Building Traffic Study* (Traffic Study) for the proposed project, prepared by Stantec Consulting Services (dated July 2017), the proposed project would result in approximately 113 new daily trips.[16] Table 1, *Greenhouse Gas Emissions*, presents the estimated CO_2, N_2O, and CH_4 emissions of the proposed project with GHG-reducing design features. The CalEEMod outputs are contained within the Appendix A, *Greenhouse Gas Emissions Data*.

As shown in Table 1, GHG emissions resulting from both construction and operation of the proposed project would result in approximately 1,216.52 $MTCO_2eq$/yr.

Direct Project-Related Sources of Greenhouse Gases

- Construction Emissions. Construction GHG emissions are typically summed and amortized over the lifetime of the project (assumed to be 30 years), then added to the operational emissions.[17] As seen in Table 1, the proposed project would result in 481.42 $MTCO_2eq$/yr, which represents 16.05 $MTCO_2eq$/yr when amortized over 30 years.

- Area Source. Area source emissions occur from hearths, architectural coatings, landscaping equipment, and consumer products. The project proposes an Interdisciplinary Science Building and would not include hearths. Area source GHG emissions would primarily occur from landscaping and consumer products. Area source

[16] It should be noted that the Final Traffic Study identifies 113 new daily trips associated with the project. However, modeling in this report is conservatively based on 193 new daily trips identified in an earlier draft of the Traffic Study.

[17] The project lifetime is based on the standard 30 year assumption of the South Coast Air Quality Management District, *Draft Guidance Document – Interim CEQA Greenhouse Gas (GHG) Significance Threshold,* October 2008.

emissions were calculated using CalEEMod and project-specific land use data. As noted in Table 1, the proposed project would result in 0.01 $MTCO_2eq$/year from area source GHG emissions.

- Mobile Source. The CalEEMod model relies upon trip generation data and project specific land use data to calculate mobile source emissions. The project would directly result in 200.03 $MTCO_2eq$/yr of mobile source-generated GHG emissions.

Table 1
Greenhouse Gas Emissions

Source	CO_2	CH_4		N_2O		Total Metric Tons of CO_2eq
	Metric Tons/yr[1]	Metric Tons/yr[1]	Metric Tons of CO_2eq[2]	Metric Tons/yr[1]	Metric Tons of CO_2eq[2]	
Direct Emissions						
• Construction (total of 481.42 $MTCO_2eq$ amortized over 30 years)	0.08	0.00	0.05	0.00	0.00	16.05
• Area Source	0.00	0.00	0.00	0.00	0.00	0.01
• Mobile Source	199.82	0.01	0.22	0.00	0.00	200.03
Total Direct Emissions[3]	199.9	0.01	0.27	0.00	0.00	216.09
Indirect Emissions						
• Energy	973.45	0.04	0.92	0.01	2.96	977.32
• Water Demand	4.28	0.01	0.35	0.00	0.11	4.75
• Solid Waste Generation	7.41	0.44	10.95	0.00	0.00	18.36
Total Indirect Emissions[3]	985.14	0.49	12.22	0.01	3.07	1,000.43
Total Project-Related Emissions[3]	*1,216.52 $MTCO_2eq/yr$*					
GHG Emissions Threshold	*3,000.00 $MTCO_2eq/yr$*[5]					
GHG Emissions Exceed Threshold?	*No*					

Notes:
1. Emissions calculated using CalEEMod.
2. CO_2 Equivalent values calculated using the EPA Website, *Greenhouse Gas Equivalencies Calculator*, http://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator, accessed July 2017.
3. Totals may be slightly off due to rounding.

Refer to Appendix A, *Greenhouse Gas Emissions Data*, for detailed model input/output data.

Indirect Project-Related Sources of Greenhouse Gases

- Energy Consumption. Energy consumption emissions were calculated using CalEEMod and project-specific land use data. Electricity would be provided to the project site via Southern California Edison (SCE). The project would indirectly result in 977.32 $MTCO_2eq$/year due to energy consumption.

- Water Demand. The project operations would result in a demand of approximately 1.01 million gallons of water per year. Emissions from indirect energy impacts due to water supply would result in 4.75 $MTCO_2eq$/year.

- Solid Waste. Solid waste associated with operations of the proposed project would result in 18.36 $MTCO_2eq$/year.

Project Design Features

It is noted that Table 1 includes reduced emissions from the project's design features in compliance with the Sustainable Practices Policy. Such features include the use of water conservation measures, such as low-flow faucets, showers, toilets, water-efficient landscaping and irrigation systems, and use of reclaimed water and grey water. In addition, the project would meet or exceed the Leadership in Energy and Environmental Design (LEED) Gold rating, utilize high-efficiency lighting, an Energy Efficient HVAC System / High Performance Fume Hoods, sustainable laboratories, chilled beams, photovoltaic panels and exceed Title 24 standards by 20 percent.

Conclusion

As depicted in Table 1, implementation of the proposed project would result in project-related GHG emissions of 1,216.52 $MTCO_2eq$/yr. Therefore, the project would not exceed the 3,000 $MTCO_2eq$/yr significance threshold. Impacts in this regard would be less than significant.

Level of Significance After Mitigation: *Less Than Significant Impact.*

GHG PLAN CONSISTENCY

GHG-2 CONFLICT WITH AN APPLICABLE PLAN, POLICY, OR REGULATION ADOPTED FOR THE PURPOSE OF REDUCING THE EMISSIONS OF GREENHOUSE GASES?

Level of Significance Before Mitigation: *Less Than Significant Impact.*

As discussed above, UCI's Sustainable Practices Policy establishes goals and policies to reduce GHG emissions from various sources at the UCI campus. In addition, UCI adopted a Climate Action Plan (CAP) in 2007 (updated in 2016) in cooperation with AB 32, and has guided an array of climate action protection strategies and projects to reduce UCI GHG emissions. The purpose of this CAP is to identify UCI's long-term vision and commitment to reduce its GHG emissions in support of University of California Sustainability Practices Policy and campus sustainability goals. These commitments include reduction of GHG emissions to 1990 levels by the year 2020 (a reduction of approximately 49 percent from projected emissions), climate neutrality by the year 2025 (for on-site combustion of fossil fuels and purchased electricity), and climate neutrality by the year 2050 (for UCI commuters and University funded air travel). The CAP does not contain GHG thresholds.

As noted above, the project's GHG emissions would be below the 3,000 $MTCO_2eq$ per year significance threshold. In addition, the project would incorporate various sustainable project design features (e.g., water conservation measures, exceed LEED Gold rating, exceed Title 24 by 20 percent, use energy efficient lighting, utilize an Energy Efficient HVAC System / High Performance Fume Hoods, contain sustainable laboratories, chilled beams, photovoltaic panels etc.) in compliance with the Sustainable Practices Policy. Therefore, the proposed project would not conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs. Thus, a less than significant impact would occur in this regard.

Mitigation Measures: No mitigation measures are required.

Level of Significance After Mitigation: *Less Than Significant Impact.*

6.0 REFERENCES

6.1 LIST OF PREPARERS

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11. U.S. Environmental Protection Agency, *Stratospheric Ozone Protection and Climate Change,* http://www.epa.gov/ozone/climate.html, accessed on July 17, 2017.

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6.3 WEB SITES/PROGRAMS

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Google Earth, 2017.

APPENDIX A: GREENHOUSE GAS EMISSIONS DATA

UCI ISB
Orange County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
University/College (4Yr)	200.00	Student	1.00	200,000.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	30
Climate Zone	8			**Operational Year**	2020
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	702.44	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - 200,000 square feet building with 200 people.

Construction Phase - 24 month construction period.

Grading - Project would export 400,000 CF = approx. 14,815 Cubic Yards.

Demolition - Surface parking lot to be removed approx. 160,000 GSF.

Trips and VMT -

Vehicle Trips - Per traffic study the project would generate total of 193 ADT with 200 people.

Stationary Sources - Emergency Generators and Fire Pumps -

Construction Off-road Equipment Mitigation - Per SCAQMD Rule 403.

Area Mitigation -

Energy Mitigation -

Water Mitigation -

Waste Mitigation -

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	CleanPavedRoadPercentReduction	0	6
tblConstDustMitigation	WaterUnpavedRoadMoistureContent	0	12
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstructionPhase	NumDays	5.00	197.00
tblConstructionPhase	NumDays	100.00	436.00
tblConstructionPhase	NumDays	2.00	66.00
tblConstructionPhase	NumDays	5.00	10.00
tblConstructionPhase	PhaseEndDate	3/30/2018	3/31/2020
tblConstructionPhase	PhaseEndDate	3/30/2018	3/31/2020
tblConstructionPhase	PhaseEndDate	3/30/2018	4/13/2018
tblConstructionPhase	PhaseEndDate	3/30/2018	7/16/2018
tblConstructionPhase	PhaseEndDate	3/30/2018	7/30/2018
tblConstructionPhase	PhaseStartDate	3/31/2018	6/30/2019
tblConstructionPhase	PhaseStartDate	3/31/2018	7/31/2018
tblConstructionPhase	PhaseStartDate	3/31/2018	4/14/2018
tblConstructionPhase	PhaseStartDate	3/31/2018	7/17/2018
tblGrading	AcresOfGrading	24.75	0.75
tblGrading	MaterialExported	0.00	14,815.00
tblLandUse	BuildingSpaceSquareFeet	36,759.49	200,000.00
tblLandUse	LandUseSquareFeet	36,759.49	200,000.00
tblLandUse	LotAcreage	0.84	1.00
tblProjectCharacteristics	OperationalYear	2018	2020
tblStationaryGeneratorsPumpsEF	CH4_EF	0.07	0.07
tblStationaryGeneratorsPumpsEF	ROG_EF	2.2480e-003	2.2477e-003
tblStationaryGeneratorsPumpsUse	HorsePowerValue	0.00	2,600.00
tblStationaryGeneratorsPumpsUse	HoursPerYear	0.00	8.00
tblStationaryGeneratorsPumpsUse	NumberOfEquipment	0.00	1.00
tblVehicleTrips	ST_TR	1.30	0.97
tblVehicleTrips	WD_TR	1.71	0.97

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					
2018	0.2504	2.3286	1.4444	3.8300e-003	0.3019	0.0982	0.4001	0.1155	0.0932	0.2087	0.0000	352.0285	352.0285	0.0538	0.0000	353.3740
2019	1.0022	2.7418	2.4260	5.4600e-003	0.1598	0.1322	0.2920	0.0431	0.1280	0.1710	0.0000	479.9372	479.9372	0.0595	0.0000	481.4243
2020	0.3960	0.6581	0.6208	1.4200e-003	0.0428	0.0303	0.0731	0.0115	0.0294	0.0409	0.0000	124.5957	124.5957	0.0145	0.0000	124.9579
Maximum	**1.0022**	**2.7418**	**2.4260**	**5.4600e-003**	**0.3019**	**0.1322**	**0.4001**	**0.1155**	**0.1280**	**0.2087**	**0.0000**	**479.9372**	**479.9372**	**0.0595**	**0.0000**	**481.4243**

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					
2018	0.2504	2.3286	1.4444	3.8300e-003	0.1748	0.0982	0.2730	0.0619	0.0932	0.1551	0.0000	352.0283	352.0283	0.0538	0.0000	353.3738
2019	1.0022	2.7418	2.4260	5.4600e-003	0.1517	0.1322	0.2840	0.0411	0.1280	0.1690	0.0000	479.9369	479.9369	0.0595	0.0000	481.4240
2020	0.3960	0.6581	0.6208	1.4200e-003	0.0406	0.0303	0.0709	0.0110	0.0294	0.0404	0.0000	124.5956	124.5956	0.0145	0.0000	124.9578
Maximum	**1.0022**	**2.7418**	**2.4260**	**5.4600e-003**	**0.1748**	**0.1322**	**0.2840**	**0.0619**	**0.1280**	**0.1690**	**0.0000**	**479.9369**	**479.9369**	**0.0595**	**0.0000**	**481.4240**

	ROG	**NOx**	**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**	**27.22**	**0.00**	**17.94**	**33.01**	**0.00**	**13.35**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	4-1-2018	6-30-2018	0.9832	0.9832
2	7-1-2018	9-30-2018	0.7632	0.7632
3	10-1-2018	12-31-2018	0.8151	0.8151
4	1-1-2019	3-31-2019	0.7319	0.7319
5	4-1-2019	6-30-2019	0.7417	0.7417
6	7-1-2019	9-30-2019	1.1278	1.1278
7	10-1-2019	12-31-2019	1.1307	1.1307
8	1-1-2020	3-31-2020	1.0533	1.0533
		Highest	1.1307	1.1307

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	0.8156	2.0000e-005	2.5700e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	4.9600e-003	4.9600e-003	1.0000e-005	0.0000	5.3000e-003
Energy	0.0166	0.1508	0.1267	9.0000e-004		0.0115	0.0115		0.0115	0.0115	0.0000	973.4455	973.4455	0.0366	9.9200e-003	977.3162
Mobile	0.0468	0.2042	0.6141	2.1700e-003	0.1885	2.2000e-003	0.1907	0.0505	2.0700e-003	0.0525	0.0000	199.8162	199.8162	8.6700e-003	0.0000	200.0329
Stationary	0.0171	0.0763	0.0435	8.0000e-005		2.5100e-003	2.5100e-003		2.5100e-003	2.5100e-003	0.0000	7.9206	7.9206	1.1100e-003	0.0000	7.9483
Waste						0.0000	0.0000		0.0000	0.0000	7.4092	0.0000	7.4092	0.4379	0.0000	18.3559
Water						0.0000	0.0000		0.0000	0.0000	0.1359	4.1475	4.2834	0.0141	3.6000e-004	4.7452
Total	**0.8961**	**0.4314**	**0.7868**	**3.1500e-003**	**0.1885**	**0.0162**	**0.2046**	**0.0505**	**0.0161**	**0.0665**	**7.5450**	**1,185.3347**	**1,192.8798**	**0.4983**	**0.0103**	**1,208.4039**

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	0.8156	2.0000e-005	2.5700e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	4.9600e-003	4.9600e-003	1.0000e-005	0.0000	5.3000e-003
Energy	0.0144	0.1308	0.1099	7.9000e-004		9.9400e-003	9.9400e-003		9.9400e-003	9.9400e-003	0.0000	824.5434	824.5434	0.0309	8.4400e-003	827.8301
Mobile	0.0468	0.2042	0.6141	2.1700e-003	0.1885	2.2000e-003	0.1907	0.0505	2.0700e-003	0.0525	0.0000	199.8162	199.8162	8.6700e-003	0.0000	200.0329
Stationary	0.0171	0.0763	0.0435	8.0000e-005		2.5100e-003	2.5100e-003		2.5100e-003	2.5100e-003	0.0000	7.9206	7.9206	1.1100e-003	0.0000	7.9483
Waste						0.0000	0.0000		0.0000	0.0000	3.7046	0.0000	3.7046	0.2189	0.0000	9.1780
Water						0.0000	0.0000		0.0000	0.0000	0.1087	3.7922	3.9009	0.0113	3.0000e-004	4.2721
Total	**0.8939**	**0.4114**	**0.7701**	**3.0400e-003**	**0.1885**	**0.0147**	**0.2031**	**0.0505**	**0.0145**	**0.0650**	**3.8133**	**1,036.0773**	**1,039.8906**	**0.2709**	**8.7400e-003**	**1,049.2667**

	ROG	**NOx**	**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	**0.25**	**4.62**	**2.13**	**3.49**	**0.00**	**9.39**	**0.74**	**0.00**	**9.47**	**2.29**	**49.46**	**12.59**	**12.83**	**45.63**	**14.98**	**13.17**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Grading	Grading	4/14/2018	7/16/2018	5	66	
2	Demolition	Demolition	4/1/2018	4/13/2018	5	10	
3	Paving	Paving	7/17/2018	7/30/2018	5	10	
4	Building Construction	Building Construction	7/31/2018	3/31/2020	5	436	
5	Architectural Coating	Architectural Coating	6/30/2019	3/31/2020	5	197	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0.75

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 300,000; Non-Residential Outdoor: 100,000; Striped Parking

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Architectural Coating	Air Compressors	1	6.00	78	0.48
Paving	Cement and Mortar Mixers	1	6.00	9	0.56
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Cranes	1	6.00	231	0.29
Building Construction	Forklifts	1	6.00	89	0.20
Paving	Pavers	1	6.00	130	0.42
Paving	Rollers	1	7.00	80	0.38
Demolition	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Rubber Tired Dozers	1	6.00	247	0.40
Building Construction	Tractors/Loaders/Backhoes	1	6.00	97	0.37
Demolition	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Grading	Tractors/Loaders/Backhoes	1	7.00	97	0.37
Paving	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Grading	Graders	1	6.00	187	0.41
Paving	Paving Equipment	1	8.00	132	0.36
Building Construction	Welders	3	8.00	46	0.45

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	5	13.00	0.00	593.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Grading	3	8.00	0.00	1,852.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	7	84.00	33.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	5	13.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	17.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Replace Ground Cover

Water Exposed Area

Water Unpaved Roads

Reduce Vehicle Speed on Unpaved Roads

Clean Paved Roads

3.2 Grading - 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					
Fugitive Dust					0.1503	0.0000	0.1503	0.0821	0.0000	0.0821	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0494	0.5632	0.2232	4.7000e-004		0.0262	0.0262		0.0241	0.0241	0.0000	42.5484	42.5484	0.0133	0.0000	42.8796
Total	**0.0494**	**0.5632**	**0.2232**	**4.7000e-004**	**0.1503**	**0.0262**	**0.1765**	**0.0821**	**0.0241**	**0.1062**	**0.0000**	**42.5484**	**42.5484**	**0.0133**	**0.0000**	**42.8796**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	8.0800e-003	0.2989	0.0677	7.2000e-004	0.0159	1.1600e-003	0.0170	4.3500e-003	1.1100e-003	5.4600e-003	0.0000	72.6625	72.6625	7.7300e-003	0.0000	72.8558
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.2000e-003	9.1000e-004	9.8600e-003	3.0000e-005	2.9000e-003	2.0000e-005	2.9200e-003	7.7000e-004	2.0000e-005	7.9000e-004	0.0000	2.6620	2.6620	7.0000e-005	0.0000	2.6637

Total	**9.2800e-003**	**0.2998**	**0.0775**	**7.5000e-004**	**0.0188**	**1.1800e-003**	**0.0200**	**5.1200e-003**	**1.1300e-003**	**6.2500e-003**	**0.0000**	**75.3245**	**75.3245**	**7.8000e-003**	**0.0000**	**75.5195**

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					0.0643	0.0000	0.0643	0.0351	0.0000	0.0351	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0494	0.5632	0.2232	4.7000e-004		0.0262	0.0262		0.0241	0.0241	0.0000	42.5484	42.5484	0.0133	0.0000	42.8795
Total	**0.0494**	**0.5632**	**0.2232**	**4.7000e-004**	**0.0643**	**0.0262**	**0.0905**	**0.0351**	**0.0241**	**0.0592**	**0.0000**	**42.5484**	**42.5484**	**0.0133**	**0.0000**	**42.8795**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	8.0800e-003	0.2989	0.0677	7.2000e-004	0.0152	1.1600e-003	0.0163	4.1800e-003	1.1100e-003	5.2900e-003	0.0000	72.6625	72.6625	7.7300e-003	0.0000	72.8558
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.2000e-003	9.1000e-004	9.8600e-003	3.0000e-005	2.7500e-003	2.0000e-005	2.7700e-003	7.3000e-004	2.0000e-005	7.5000e-004	0.0000	2.6620	2.6620	7.0000e-005	0.0000	2.6637
Total	**9.2800e-003**	**0.2998**	**0.0775**	**7.5000e-004**	**0.0179**	**1.1800e-003**	**0.0191**	**4.9100e-003**	**1.1300e-003**	**6.0400e-003**	**0.0000**	**75.3245**	**75.3245**	**7.8000e-003**	**0.0000**	**75.5195**

3.3 Demolition - 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					
Fugitive Dust					0.0642	0.0000	0.0642	9.7200e-003	0.0000	9.7200e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0124	0.1218	0.0756	1.2000e-004		7.1800e-003	7.1800e-003		6.7100e-003	6.7100e-003	0.0000	10.8462	10.8462	2.7500e-003	0.0000	10.9148
Total	**0.0124**	**0.1218**	**0.0756**	**1.2000e-004**	**0.0642**	**7.1800e-003**	**0.0714**	**9.7200e-003**	**6.7100e-003**	**0.0164**	**0.0000**	**10.8462**	**10.8462**	**2.7500e-003**	**0.0000**	**10.9148**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	2.5900e-003	0.0957	0.0217	2.3000e-004	5.0800e-003	3.7000e-004	5.4500e-003	1.3900e-003	3.6000e-004	1.7500e-003	0.0000	23.2661	23.2661	2.4700e-003	0.0000	23.3280
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	2.9000e-004	2.2000e-004	2.4300e-003	1.0000e-005	7.1000e-004	0.0000	7.2000e-004	1.9000e-004	0.0000	1.9000e-004	0.0000	0.6554	0.6554	2.0000e-005	0.0000	0.6558
Total	**2.8800e-003**	**0.0959**	**0.0241**	**2.4000e-004**	**5.7900e-003**	**3.7000e-004**	**6.1700e-003**	**1.5800e-003**	**3.6000e-004**	**1.9400e-003**	**0.0000**	**23.9215**	**23.9215**	**2.4900e-003**	**0.0000**	**23.9838**

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					0.0274	0.0000	0.0274	4.1600e-003	0.0000	4.1600e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0124	0.1218	0.0756	1.2000e-004		7.1800e-003	7.1800e-003		6.7100e-003	6.7100e-003	0.0000	10.8461	10.8461	2.7500e-003	0.0000	10.9148

Total	0.0124	0.1218	0.0756	1.2000e-004	0.0274	7.1800e-003	0.0346	4.1600e-003	6.7100e-003	0.0109	0.0000	10.8461	10.8461	2.7500e-003	0.0000	10.9148

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	2.5900e-003	0.0957	0.0217	2.3000e-004	4.8500e-003	3.7000e-004	5.2200e-003	1.3400e-003	3.6000e-004	1.6900e-003	0.0000	23.2661	23.2661	2.4700e-003	0.0000	23.3280
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	2.9000e-004	2.2000e-004	2.4300e-003	1.0000e-005	6.8000e-004	0.0000	6.8000e-004	1.8000e-004	0.0000	1.8000e-004	0.0000	0.6554	0.6554	2.0000e-005	0.0000	0.6558
Total	**2.8800e-003**	**0.0959**	**0.0241**	**2.4000e-004**	**5.5300e-003**	**3.7000e-004**	**5.9000e-003**	**1.5200e-003**	**3.6000e-004**	**1.8700e-003**	**0.0000**	**23.9215**	**23.9215**	**2.4900e-003**	**0.0000**	**23.9838**

3.4 Paving - 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	5.0900e-003	0.0523	0.0450	7.0000e-005		3.0500e-003	3.0500e-003		2.8100e-003	2.8100e-003	0.0000	6.1073	6.1073	1.8700e-003	0.0000	6.1540
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**5.0900e-003**	**0.0523**	**0.0450**	**7.0000e-005**		**3.0500e-003**	**3.0500e-003**		**2.8100e-003**	**2.8100e-003**	**0.0000**	**6.1073**	**6.1073**	**1.8700e-003**	**0.0000**	**6.1540**

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	2.9000e-004	2.2000e-004	2.4300e-003	1.0000e-005	7.1000e-004	0.0000	7.2000e-004	1.9000e-004	0.0000	1.9000e-004	0.0000	0.6554	0.6554	2.0000e-005	0.0000	0.6558
Total	**2.9000e-004**	**2.2000e-004**	**2.4300e-003**	**1.0000e-005**	**7.1000e-004**	**0.0000**	**7.2000e-004**	**1.9000e-004**	**0.0000**	**1.9000e-004**	**0.0000**	**0.6554**	**0.6554**	**2.0000e-005**	**0.0000**	**0.6558**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	5.0900e-003	0.0523	0.0450	7.0000e-005		3.0500e-003	3.0500e-003		2.8100e-003	2.8100e-003	0.0000	6.1073	6.1073	1.8700e-003	0.0000	6.1540
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**5.0900e-003**	**0.0523**	**0.0450**	**7.0000e-005**		**3.0500e-003**	**3.0500e-003**		**2.8100e-003**	**2.8100e-003**	**0.0000**	**6.1073**	**6.1073**	**1.8700e-003**	**0.0000**	**6.1540**

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	2.9000e-004	2.2000e-004	2.4300e-003	1.0000e-005	6.8000e-004	0.0000	6.8000e-004	1.8000e-004	0.0000	1.8000e-004	0.0000	0.6554	0.6554	2.0000e-005	0.0000	0.6558
Total	**2.9000e-004**	**2.2000e-004**	**2.4300e-003**	**1.0000e-005**	**6.8000e-004**	**0.0000**	**6.8000e-004**	**1.8000e-004**	**0.0000**	**1.8000e-004**	**0.0000**	**0.6554**	**0.6554**	**2.0000e-005**	**0.0000**	**0.6558**

3.5 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	0.1426	0.9585	0.7632	1.2100e-003		0.0582	0.0582		0.0562	0.0562	0.0000	101.3290	101.3290	0.0204	0.0000	101.8390
Total	**0.1426**	**0.9585**	**0.7632**	**1.2100e-003**		**0.0582**	**0.0582**		**0.0562**	**0.0562**	**0.0000**	**101.3290**	**101.3290**	**0.0204**	**0.0000**	**101.8390**

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	7.4900e-003	0.2210	0.0610	4.5000e-004	0.0114	1.6100e-003	0.0130	3.3000e-003	1.5400e-003	4.8400e-003	0.0000	44.7119	44.7119	4.0200e-003	0.0000	44.8123
Worker	0.0210	0.0159	0.1725	5.2000e-004	0.0507	3.4000e-004	0.0511	0.0135	3.1000e-004	0.0138	0.0000	46.5843	46.5843	1.2400e-003	0.0000	46.6152
Total	**0.0285**	**0.2369**	**0.2335**	**9.7000e-004**	**0.0622**	**1.9500e-003**	**0.0641**	**0.0168**	**1.8500e-003**	**0.0186**	**0.0000**	**91.2962**	**91.2962**	**5.2600e-003**	**0.0000**	**91.4275**

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	0.1426	0.9585	0.7632	1.2100e-003		0.0582	0.0582		0.0562	0.0562	0.0000	101.3289	101.3289	0.0204	0.0000	101.8389
Total	**0.1426**	**0.9585**	**0.7632**	**1.2100e-003**		**0.0582**	**0.0582**		**0.0562**	**0.0562**	**0.0000**	**101.3289**	**101.3289**	**0.0204**	**0.0000**	**101.8389**

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	7.4900e-003	0.2210	0.0610	4.5000e-004	0.0109	1.6100e-003	0.0126	3.1800e-003	1.5400e-003	4.7200e-003	0.0000	44.7119	44.7119	4.0200e-003	0.0000	44.8123
Worker	0.0210	0.0159	0.1725	5.2000e-004	0.0481	3.4000e-004	0.0484	0.0128	3.1000e-004	0.0131	0.0000	46.5843	46.5843	1.2400e-003	0.0000	46.6152
Total	**0.0285**	**0.2369**	**0.2335**	**9.7000e-004**	**0.0590**	**1.9500e-003**	**0.0610**	**0.0160**	**1.8500e-003**	**0.0179**	**0.0000**	**91.2962**	**91.2962**	**5.2600e-003**	**0.0000**	**91.4275**

3.5 Building Construction - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.2965	2.0854	1.7601	2.8800e-003		0.1195	0.1195		0.1154	0.1154	0.0000	238.9088	238.9088	0.0459	0.0000	240.0570

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Total	**0.2965**	**2.0854**	**1.7601**	**2.8800e-003**		**0.1195**	**0.1195**		**0.1154**	**0.1154**	**0.0000**	**238.9088**	**238.9088**	**0.0459**	**0.0000**	**240.0570**

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	0.0165	0.4984	0.1356	1.0700e-003	0.0271	3.3300e-003	0.0304	7.8200e-003	3.1800e-003	0.0110	0.0000	105.5581	105.5581	9.2100e-003	0.0000	105.7884
Worker	0.0458	0.0334	0.3708	1.1900e-003	0.1203	8.2000e-004	0.1212	0.0320	7.5000e-004	0.0327	0.0000	107.6050	107.6050	2.6500e-003	0.0000	107.6713
Total	**0.0623**	**0.5318**	**0.5064**	**2.2600e-003**	**0.1475**	**4.1500e-003**	**0.1516**	**0.0398**	**3.9300e-003**	**0.0437**	**0.0000**	**213.1631**	**213.1631**	**0.0119**	**0.0000**	**213.4597**

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	0.2965	2.0854	1.7601	2.8800e-003		0.1195	0.1195		0.1154	0.1154	0.0000	238.9086	238.9086	0.0459	0.0000	240.0568
Total	**0.2965**	**2.0854**	**1.7601**	**2.8800e-003**		**0.1195**	**0.1195**		**0.1154**	**0.1154**	**0.0000**	**238.9086**	**238.9086**	**0.0459**	**0.0000**	**240.0568**

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	0.0165	0.4984	0.1356	1.0700e-003	0.0260	3.3300e-003	0.0293	7.5400e-003	3.1800e-003	0.0107	0.0000	105.5581	105.5581	9.2100e-003	0.0000	105.7884
Worker	0.0458	0.0334	0.3708	1.1900e-003	0.1141	8.2000e-004	0.1149	0.0304	7.5000e-004	0.0312	0.0000	107.6050	107.6050	2.6500e-003	0.0000	107.6713
Total	**0.0623**	**0.5318**	**0.5064**	**2.2600e-003**	**0.1400**	**4.1500e-003**	**0.1442**	**0.0380**	**3.9300e-003**	**0.0419**	**0.0000**	**213.1631**	**213.1631**	**0.0119**	**0.0000**	**213.4597**

3.5 Building Construction - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0660	0.4806	0.4286	7.2000e-004		0.0259	0.0259		0.0250	0.0250	0.0000	59.0012	59.0012	0.0110	0.0000	59.2750
Total	**0.0660**	**0.4806**	**0.4286**	**7.2000e-004**		**0.0259**	**0.0259**		**0.0250**	**0.0250**	**0.0000**	**59.0012**	**59.0012**	**0.0110**	**0.0000**	**59.2750**

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

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Vendor	3.4900e-003	0.1138	0.0309	2.6000e-004	6.7500e-003	5.9000e-004	7.3400e-003	1.9500e-003	5.6000e-004	2.5100e-003	0.0000	26.1074	26.1074	2.1800e-003	0.0000	26.1619
Worker	0.0106	7.4500e-003	0.0846	2.9000e-004	0.0300	2.0000e-004	0.0302	7.9600e-003	1.9000e-004	8.1400e-003	0.0000	25.9394	25.9394	5.9000e-004	0.0000	25.9542
Total	**0.0141**	**0.1212**	**0.1156**	**5.5000e-004**	**0.0367**	**7.9000e-004**	**0.0375**	**9.9100e-003**	**7.5000e-004**	**0.0107**	**0.0000**	**52.0468**	**52.0468**	**2.7700e-003**	**0.0000**	**52.1161**

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	0.0660	0.4806	0.4286	7.2000e-004		0.0259	0.0259		0.0250	0.0250	0.0000	59.0011	59.0011	0.0110	0.0000	59.2749
Total	**0.0660**	**0.4806**	**0.4286**	**7.2000e-004**		**0.0259**	**0.0259**		**0.0250**	**0.0250**	**0.0000**	**59.0011**	**59.0011**	**0.0110**	**0.0000**	**59.2749**

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	3.4900e-003	0.1138	0.0309	2.6000e-004	6.4600e-003	5.9000e-004	7.0500e-003	1.8800e-003	5.6000e-004	2.4400e-003	0.0000	26.1074	26.1074	2.1800e-003	0.0000	26.1619
Worker	0.0106	7.4500e-003	0.0846	2.9000e-004	0.0284	2.0000e-004	0.0286	7.5800e-003	1.9000e-004	7.7600e-003	0.0000	25.9394	25.9394	5.9000e-004	0.0000	25.9542
Total	**0.0141**	**0.1212**	**0.1156**	**5.5000e-004**	**0.0349**	**7.9000e-004**	**0.0357**	**9.4600e-003**	**7.5000e-004**	**0.0102**	**0.0000**	**52.0468**	**52.0468**	**2.7700e-003**	**0.0000**	**52.1161**

3.6 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	0.6211					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0176	0.1211	0.1215	2.0000e-004		8.5000e-003	8.5000e-003		8.5000e-003	8.5000e-003	0.0000	16.8515	16.8515	1.4200e-003	0.0000	16.8871
Total	**0.6387**	**0.1211**	**0.1215**	**2.0000e-004**		**8.5000e-003**	**8.5000e-003**		**8.5000e-003**	**8.5000e-003**	**0.0000**	**16.8515**	**16.8515**	**1.4200e-003**	**0.0000**	**16.8871**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.6900e-003	3.4200e-003	0.0380	1.2000e-004	0.0123	8.0000e-005	0.0124	3.2700e-003	8.0000e-005	3.3500e-003	0.0000	11.0138	11.0138	2.7000e-004	0.0000	11.0205
Total	**4.6900e-003**	**3.4200e-003**	**0.0380**	**1.2000e-004**	**0.0123**	**8.0000e-005**	**0.0124**	**3.2700e-003**	**8.0000e-005**	**3.3500e-003**	**0.0000**	**11.0138**	**11.0138**	**2.7000e-004**	**0.0000**	**11.0205**

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	0.6211					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Off-Road	0.0176	0.1211	0.1215	2.0000e-004		8.5000e-003	8.5000e-003		8.5000e-003	8.5000e-003	0.0000	16.8515	16.8515	1.4200e-003	0.0000	16.8870
Total	**0.6387**	**0.1211**	**0.1215**	**2.0000e-004**		**8.5000e-003**	**8.5000e-003**		**8.5000e-003**	**8.5000e-003**	**0.0000**	**16.8515**	**16.8515**	**1.4200e-003**	**0.0000**	**16.8870**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.6900e-003	3.4200e-003	0.0380	1.2000e-004	0.0117	8.0000e-005	0.0118	3.1100e-003	8.0000e-005	3.1900e-003	0.0000	11.0138	11.0138	2.7000e-004	0.0000	11.0205
Total	**4.6900e-003**	**3.4200e-003**	**0.0380**	**1.2000e-004**	**0.0117**	**8.0000e-005**	**0.0118**	**3.1100e-003**	**8.0000e-005**	**3.1900e-003**	**0.0000**	**11.0138**	**11.0138**	**2.7000e-004**	**0.0000**	**11.0205**

3.6 Architectural Coating - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.3059					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	7.8700e-003	0.0547	0.0595	1.0000e-004		3.6100e-003	3.6100e-003		3.6100e-003	3.6100e-003	0.0000	8.2981	8.2981	6.4000e-004	0.0000	8.3141
Total	**0.3137**	**0.0547**	**0.0595**	**1.0000e-004**		**3.6100e-003**	**3.6100e-003**		**3.6100e-003**	**3.6100e-003**	**0.0000**	**8.2981**	**8.2981**	**6.4000e-004**	**0.0000**	**8.3141**

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	2.1500e-003	1.5100e-003	0.0171	6.0000e-005	6.0700e-003	4.0000e-005	6.1100e-003	1.6100e-003	4.0000e-005	1.6500e-003	0.0000	5.2496	5.2496	1.2000e-004	0.0000	5.2526
Total	**2.1500e-003**	**1.5100e-003**	**0.0171**	**6.0000e-005**	**6.0700e-003**	**4.0000e-005**	**6.1100e-003**	**1.6100e-003**	**4.0000e-005**	**1.6500e-003**	**0.0000**	**5.2496**	**5.2496**	**1.2000e-004**	**0.0000**	**5.2526**

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	0.3059					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	7.8700e-003	0.0547	0.0595	1.0000e-004		3.6100e-003	3.6100e-003		3.6100e-003	3.6100e-003	0.0000	8.2981	8.2981	6.4000e-004	0.0000	8.3141
Total	**0.3137**	**0.0547**	**0.0595**	**1.0000e-004**		**3.6100e-003**	**3.6100e-003**		**3.6100e-003**	**3.6100e-003**	**0.0000**	**8.2981**	**8.2981**	**6.4000e-004**	**0.0000**	**8.3141**

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

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
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	2.1500e-003	1.5100e-003	0.0171	6.0000e-005	5.7500e-003	4.0000e-005	5.7900e-003	1.5300e-003	4.0000e-005	1.5700e-003	0.0000	5.2496	5.2496	1.2000e-004	0.0000	5.2526
Total	**2.1500e-003**	**1.5100e-003**	**0.0171**	**6.0000e-005**	**5.7500e-003**	**4.0000e-005**	**5.7900e-003**	**1.5300e-003**	**4.0000e-005**	**1.5700e-003**	**0.0000**	**5.2496**	**5.2496**	**1.2000e-004**	**0.0000**	**5.2526**

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	0.0468	0.2042	0.6141	2.1700e-003	0.1885	2.2000e-003	0.1907	0.0505	2.0700e-003	0.0525	0.0000	199.8162	199.8162	8.6700e-003	0.0000	200.0329
Unmitigated	0.0468	0.2042	0.6141	2.1700e-003	0.1885	2.2000e-003	0.1907	0.0505	2.0700e-003	0.0525	0.0000	199.8162	199.8162	8.6700e-003	0.0000	200.0329

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
University/College (4Yr)	193.00	193.00	0.00	496,929	496,929
Total	193.00	193.00	0.00	496,929	496,929

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)	16.60	8.40	6.90	6.40	88.60	5.00	91	9	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
University/College (4Yr)	0.555968	0.043848	0.210359	0.116378	0.016765	0.005795	0.025008	0.016160	0.001677	0.001586	0.004867	0.000586	0.001002

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

Exceed Title 24

Install High Efficiency Lighting

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	682.1048	682.1048	0.0282	5.8300e-003	684.5450
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	809.2984	809.2984	0.0334	6.9100e-003	812.1937
NaturalGas Mitigated	0.0144	0.1308	0.1099	7.9000e-004		9.9400e-003	9.9400e-003		9.9400e-003	9.9400e-003	0.0000	142.4387	142.4387	2.7300e-003	2.6100e-003	143.2851
NaturalGas Unmitigated	0.0166	0.1508	0.1267	9.0000e-004		0.0115	0.0115		0.0115	0.0115	0.0000	164.1471	164.1471	3.1500e-003	3.0100e-003	165.1225

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)	3.076e+006	0.0166	0.1508	0.1267	9.0000e-004		0.0115	0.0115		0.0115	0.0115	0.0000	164.1471	164.1471	3.1500e-003	3.0100e-003	165.1225

Total		0.0166	0.1508	0.1267	9.0000e-004		0.0115	0.0115		0.0115	0.0115	0.0000	164.1471	164.1471	3.1500e-003	3.0100e-003	165.1225

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)	2.6692e+006	0.0144	0.1308	0.1099	7.9000e-004		9.9400e-003	9.9400e-003		9.9400e-003	9.9400e-003	0.0000	142.4387	142.4387	2.7300e-003	2.6100e-003	143.2851
Total		**0.0144**	**0.1308**	**0.1099**	**7.9000e-004**		**9.9400e-003**	**9.9400e-003**		**9.9400e-003**	**9.9400e-003**	**0.0000**	**142.4387**	**142.4387**	**2.7300e-003**	**2.6100e-003**	**143.2851**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
University/College (4Yr)	2.54e+006	809.2984	0.0334	6.9100e-003	812.1937
Total		**809.2984**	**0.0334**	**6.9100e-003**	**812.1937**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
University/College (4Yr)	2.1408e+006	682.1048	0.0282	5.8300e-003	684.5450
Total		**682.1048**	**0.0282**	**5.8300e-003**	**684.5450**

6.0 Area Detail

6.1 Mitigation Measures Area

Use Low VOC Paint - Non-Residential Interior

Use Low VOC Paint - Non-Residential Exterior

Use Low VOC Cleaning Supplies

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 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	0.8156	2.0000e-005	2.5700e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	4.9600e-003	4.9600e-003	1.0000e-005	0.0000	5.3000e-003
Unmitigated	0.8156	2.0000e-005	2.5700e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	4.9600e-003	4.9600e-003	1.0000e-005	0.0000	5.3000e-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	0.0927					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.7227					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	2.4000e-004	2.0000e-005	2.5700e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	4.9600e-003	4.9600e-003	1.0000e-005	0.0000	5.3000e-003
Total	**0.8156**	**2.0000e-005**	**2.5700e-003**	**0.0000**		**1.0000e-005**	**1.0000e-005**		**1.0000e-005**	**1.0000e-005**	**0.0000**	**4.9600e-003**	**4.9600e-003**	**1.0000e-005**	**0.0000**	**5.3000e-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	0.0927					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.7227					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	2.4000e-004	2.0000e-005	2.5700e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	4.9600e-003	4.9600e-003	1.0000e-005	0.0000	5.3000e-003
Total	**0.8156**	**2.0000e-005**	**2.5700e-003**	**0.0000**		**1.0000e-005**	**1.0000e-005**		**1.0000e-005**	**1.0000e-005**	**0.0000**	**4.9600e-003**	**4.9600e-003**	**1.0000e-005**	**0.0000**	**5.3000e-003**

7.0 Water Detail

7.1 Mitigation Measures Water

Install Low Flow Bathroom Faucet

Install Low Flow Kitchen Faucet

Install Low Flow Toilet

Install Low Flow Shower

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	3.9009	0.0113	3.0000e-004	4.2721
Unmitigated	4.2834	0.0141	3.6000e-004	4.7452

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
University/College (4Yr)	0.42822 / 0.66978	4.2834	0.0141	3.6000e-004	4.7452
Total		**4.2834**	**0.0141**	**3.6000e-004**	**4.7452**

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
University/College (4Yr)	0.342576 / 0.66978	3.9009	0.0113	3.0000e-004	4.2721
Total		**3.9009**	**0.0113**	**3.0000e-004**	**4.2721**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Institute Recycling and Composting Services

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	3.7046	0.2189	0.0000	9.1780
Unmitigated	7.4092	0.4379	0.0000	18.3559

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
University/College (4Yr)	36.5	7.4092	0.4379	0.0000	18.3559
Total		**7.4092**	**0.4379**	**0.0000**	**18.3559**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
University/College (4Yr)	18.25	3.7046	0.2189	0.0000	9.1780
Total		**3.7046**	**0.2189**	**0.0000**	**9.1780**

9.0 Operational Offroad

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

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type
Emergency Generator	1	0	8	2600	0.73	Diesel

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

10.1 Stationary Sources

Unmitigated/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

Equipment Type	tons/yr										MT/yr					
Emergency Generator - Diesel	0.0171	0.0763	0.0435	8.0000e-005		2.5100e-003	2.5100e-003		2.5100e-003	2.5100e-003	0.0000	7.9206	7.9206	1.1100e-003	0.0000	7.9483
Total	**0.0171**	**0.0763**	**0.0435**	**8.0000e-005**		**2.5100e-003**	**2.5100e-003**		**2.5100e-003**	**2.5100e-003**	**0.0000**	**7.9206**	**7.9206**	**1.1100e-003**	**0.0000**	**7.9483**

11.0 Vegetation

APPENDIX C

Traffic Study

UCI Interdisciplinary Sciences Building Project Traffic Study

University of California, Irvine

Prepared for:
UC Irvine Design & Construction Services

Prepared by:
Stantec Consulting Services Inc.

July 18, 2017

Sign-off Sheet

This document entitled UCI Interdisciplinary Sciences Building Project Traffic Study was prepared by Stantec Consulting Services Inc. ("Stantec") for the account of UC Irvine Design & Construction Services (the "Client").

Prepared by ____

(signature)

Sandhya Perumalla
(949) 923-6074

Reviewed by ____

(signature)

Daryl Zerfass, PE, PTP
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Glossary

ADT	**Average Daily Traffic.** Generally used to measure the total two-directional traffic volumes passing a given point on a roadway.
ICU	**Intersection Capacity Utilization.** A measure of the volume-to-capacity ratio for an intersection. Typically used to determine the peak hour level of service for a given set of intersection volumes.
LOS	**Level of Service.** A scale used to evaluate circulation system performance based on ICU values at intersections or volume-to-capacity ratios of arterial segments.
Peak Hour	This refers to the hour during the AM peak period (typically 7 AM to 9 AM) or the PM peak period (typically 4 PM to 6 PM) in which the greatest number of vehicle trips are generated by a given land use or are travelling on a given roadway.
V/C	**Volume-to-Capacity Ratio.** This is typically used to describe the percentage of capacity utilized by existing or projected traffic on a segment of an arterial or intersection.

1.0 INTRODUCTION

Stantec Consulting Services Inc. (Stantec) has performed a traffic impact analysis for the proposed Interdisciplinary Sciences Building (ISB) Project to be located on the University of California, Irvine (UCI) campus. The purpose of this study is to determine the amount of traffic generated by the proposed ISB project and to analyze the impacts of the project on the affected portions of the circulation system.

1.1 BACKGROUND AND SCOPE

The project site is located on the site of an existing surface parking lot, west of South Circle View Drive as shown in **Figure 1-1**. The proposed project would demolish the existing 160,000 gross square-foot 12B surface parking lot to construct a 200,000 gross square-foot eight-story structure with a mechanical penthouse on a portion of the parking lot. See **Figure 1-2** for the site development plan. The other portion of the parking lot will be a part of future development. The construction would start in April 2018 and would be completed over two years. The anticipated campus population increase due to the proposed project is approximately 70 new faculty and staff. The proposed project would not increase the current student population. The new faculty and staff commuters are anticipated to park in the existing Parking Lot 16, which is adjacent (west) of the project site.

The current UCI Long Range Development Plan (LRDP), adopted in 2007, establishes a land use plan and physical planning framework to accommodate projected enrollment levels, additional academic facilities and housing, and the on-campus circulation system through the 2025-2026 horizon year. The project site is designated in the LRDP as Academic and Support Facilities.

This traffic study provides near term (Year 2020) traffic conditions analysis as the project would be built and occupied by 2020. This traffic study includes existing conditions, Year 2020 traffic impact analysis without the project and with the proposed project. The study area includes intersections located in the City of Irvine, as well as intersections and mid-block segments on the UCI main campus.

Chapter 2.0 of this report provides the transportation setting for the impact analysis, and Chapter 3.0 provides a detailed project description. Chapter 4.0 focuses on the potential traffic impacts of the project.

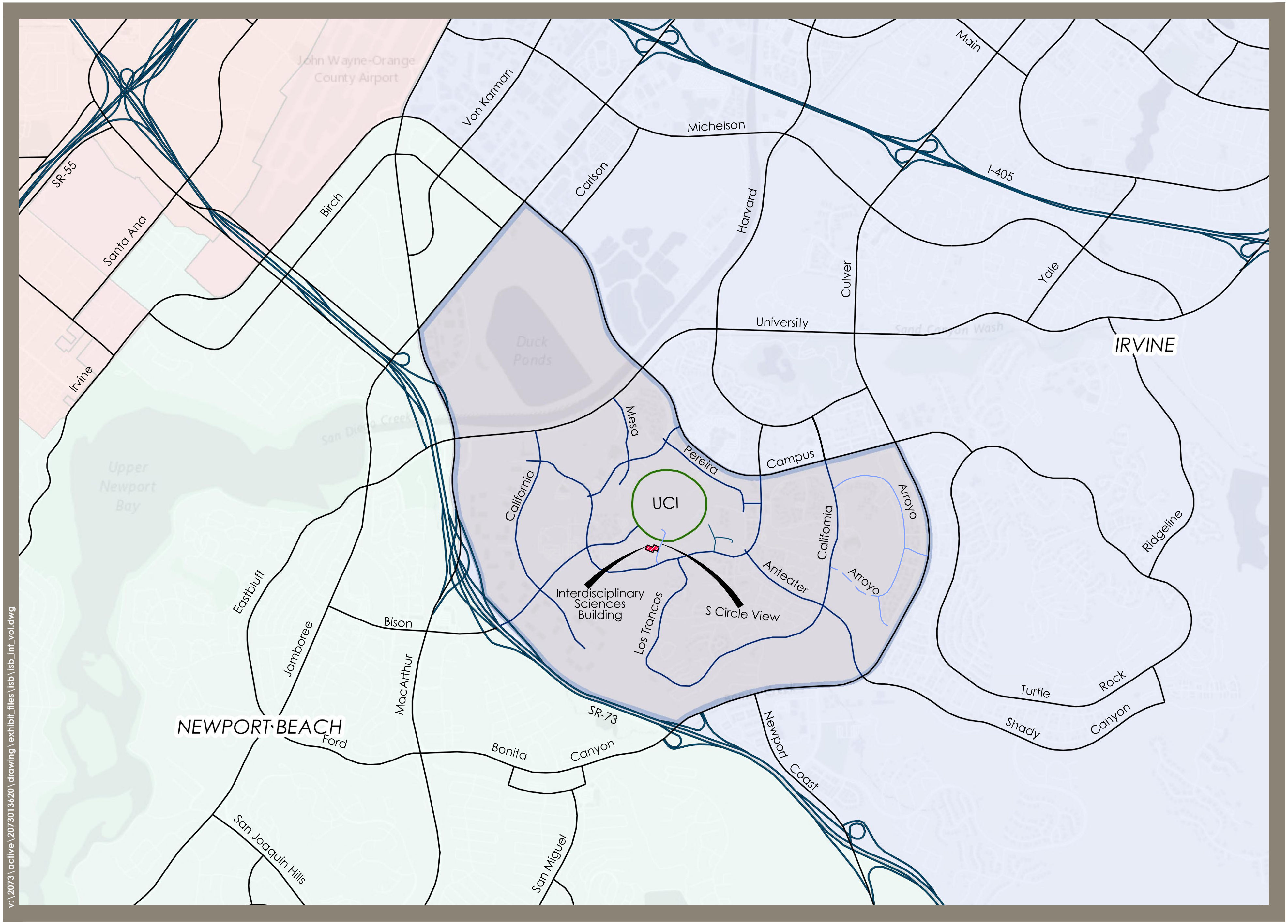

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Figure 1-1

Project Location

v:\2073\active\2073013620\drawing\exhibit_files\isb\isb_inf_vol.dwg

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N

Figure 1-2

Site Development Plan

1.3

1.2 METHODOLOGY

Existing volumes collected within the past year (October 2016, January 2017, June 2017) are used for analyzing existing conditions. The traffic forecasts for the study area circulation system for year 2020 analysis are obtained by applying a growth factor of two percent per year to the existing counts. Project-generated traffic volumes are estimated using the UCI Main Campus Traffic Model (MCTM) and the overall distribution of project traffic (for on-campus traffic patterns) is based on the project trip distribution derived from UCI MCTM. The project volumes were then added to the no-project volumes, resulting in with-project volumes. The analysis compares with-project volumes with no-project volumes to identify project impacts.

1.3 PERFORMANCE CRITERIA

The traffic analysis uses a set of performance criteria for evaluating intersection capacity to determine potential project impacts. In traffic impact studies, impact criteria are based on two primary measures. The first is "capacity," which establishes the vehicle carrying ability of a road segment, and the second is "volume." The volume-to-capacity (V/C) ratio corresponds with a level of service (LOS). Traffic LOS is designated A through F, with LOS A representing free flow conditions, and LOS F representing severe traffic congestion. Traffic flow quality for the different LOS is described in **Table 1-1**.

Average Daily Traffic (ADT) volumes are presented for roadway links in the study area. The traffic analysis also analyzes the AM and PM peak hour volumes for study area intersections. Peak hour volumes and capacities are compared by means of intersection capacity utilization (ICU) values for signalized intersections.

For the stop-controlled study intersections, the Highway Capacity Manual (HCM) methodology for estimating intersection delay is used to determine the intersection peak hour LOS. The ICU values and vehicle delay ranges that correspond to LOS A through F are summarized in **Table 1-2.**

Both the V/C and LOS are used in identifying impacts. Certain LOS values are deemed acceptable by the various governing jurisdictions within the traffic analysis study area, and increases in the V/C ratio which cause or contribute to the LOS being unacceptable are defined as an adverse impact. LOS D is the performance standard applied in this study for the intersections in the study area.

Significant impacts are defined for this analysis as an increase of 0.02 or more in the ICU value that result in LOS E or F conditions, which is consistent with the City of Irvine Traffic Impact Analysis Guidelines. This increase at a signalized intersection operating at LOS D or better is not considered a significant impact. Since UCI does not have an adopted performance criteria for intersections, the City of Irvine's performance criteria were used in the analysis to identify project impacts at on-campus signalized intersection locations. For the stop-controlled study intersections, if the LOS reaches E or F, the intersection is evaluated further for possible improvement with a traffic signal.

Table 1-1 Level of Service Descriptions – Arterial Streets and Intersections

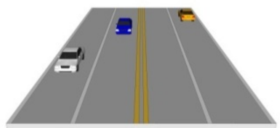
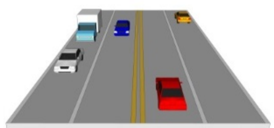
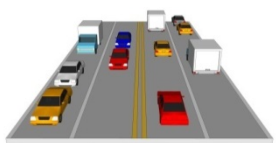
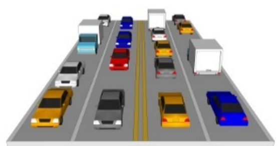
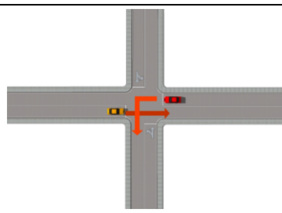
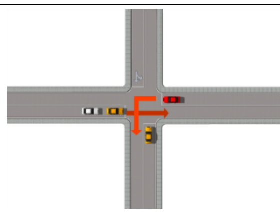
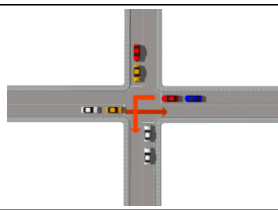
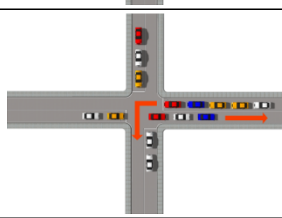
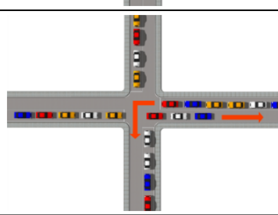
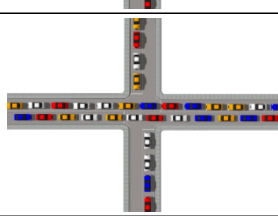
Level of Service (LOS)		Description
A		LOS A describes primarily free-flow operations. Vehicles are completely unimpeded in their ability to maneuver within the traffic stream. Control delay at the intersections is minimal. The travel speed exceeds 85% of the base free-flow speed.
B		LOS B describes reasonably unimpeded operation. The ability to maneuver within the traffic stream is only slightly restricted, and control delay at the intersections is not significant. The travel speed is between 67% and 85% of the base free-flow speed.
C		LOS C describes stable operation. The ability to maneuver and change lanes at midsegment locations may be more restricted than at LOS B. Longer queues at the intersections may contribute to lower travel speeds. The travel speed is between 50% and 67% of the base free-flow speed.
D		LOS D indicates a less stable condition in which small increases in flow may cause substantial increases in delay and decreases in travel speed. This operation may be due to adverse signal progression, high volume, or inappropriate signal timing at the intersections. The travel speed is between 40% and 50% of the base free-flow speed.
E		LOS E is characterized by unstable operation and significant delay. Such operations may be due to some combination of adverse progression, high volume, and inappropriate signal timing at the intersections. The travel speed is between 30% and 40% of the base free-flow speed.
F		LOS F is characterized by flow at extremely low speed. Congestion is likely occurring at the intersections, as indicated by high delay and extensive queuing. The travel speed is 30% or less of the base free-flow speed.
Source: Highway Capacity Manual 2010, Transportation Research Board, National Research Council		

Table 1-2 Intersection Level of Service Ranges (ICU and HCM Delay)

Level of Service (LOS)		Intersection Capacity Utilization (ICU)	Highway Capacity Manual (HCM) Average Delay Stop-Controlled Intersection
A		0.00 – 0.60	0.00 – 10.0 seconds
B		0.61 – 0.70	10.1 – 15.0 seconds
C		0.71 – 0.80	15.1 – 25.0 seconds
D		0.81 – 0.90	25.1 – 35.0 seconds
E		0.91 – 1.00	35.1 – 50.0 seconds
F		Above 1.00	Above 50.0 seconds

Sources: Highway Capacity Manual 2010, Transportation Research Board, National Research Council
Orange County Congestion Management Program

The performance criteria adopted by the City of Irvine, and applied for this analysis, are summarized in **Table 1-3.**

Table 1-3 Performance Criteria for Locations Analyzed within the Study Area

Intersections

V/C Calculation Methodology

Level of service based on peak hour intersection capacity utilization (ICU) values and calculated using the following assumptions:

City of Irvine & UCI
Saturation Flow Rate: 1,700 vehicles/hour/lane
Clearance Interval: .05
Right-Turn-On-Red Utilization Factor*: .75
* "De-facto" right-turn lane is assumed in the ICU calculation if 19 feet from edge to outside of through-lane exists and parking is prohibited during peak periods.

HCM Delay Methodology

Level of service based on peak hour average intersection delay and calculated using the following assumptions:

Ideal Flow Rate: 1,900 vehicles/hour/lane
Peak Hour Factor: measured PHF at stop-controlled intersections
Percent Heavy Vehicles: 2%

Performance Standard

Level of service D

Mitigation Requirement

For stop-controlled intersections operating greater than the performance standard for which the project increases average delay by one second or more, the intersection is evaluated further for possible improvement with a traffic signal, or geometric improvements to improve operations.

For signalized intersections operating greater than the performance standard with a project impact of 0.02 or more, the intersection is evaluated further for possible improvements to improve operations.

1.4 STUDY AREA

The study area encompasses nine intersections in and around the UCI campus. The study area was defined by identifying how project trips would distribute to the adjacent roads and determining the limits of where project peak hour impacts become insignificant. Key intersections within the study area were selected for peak hour analysis.

The study area is focused on the roadways and intersections in the immediate vicinity of the project and along the perimeter of the UCI campus, that are anticipated to be used by the proposed project based on the location of the project site and its relationship to the roadways in the area. Five of the intersections are located within the UCI campus, three are located along the perimeter of the UCI campus in the surrounding City of Irvine, and one intersection is located in the City of Irvine. There are no Orange County Congestion Management Program (CMP) monitoring intersections within the study area. **Figure 1-3** illustrates the study area for the project.

1.5 REFERENCES

1. *Highway Capacity Manual 2010*, Transportation Research Board, 2010.

2. *University of California Irvine Long Range Development Plan 2007 Update Traffic Study*, Austin-Foust Associates, Inc., May 2007.

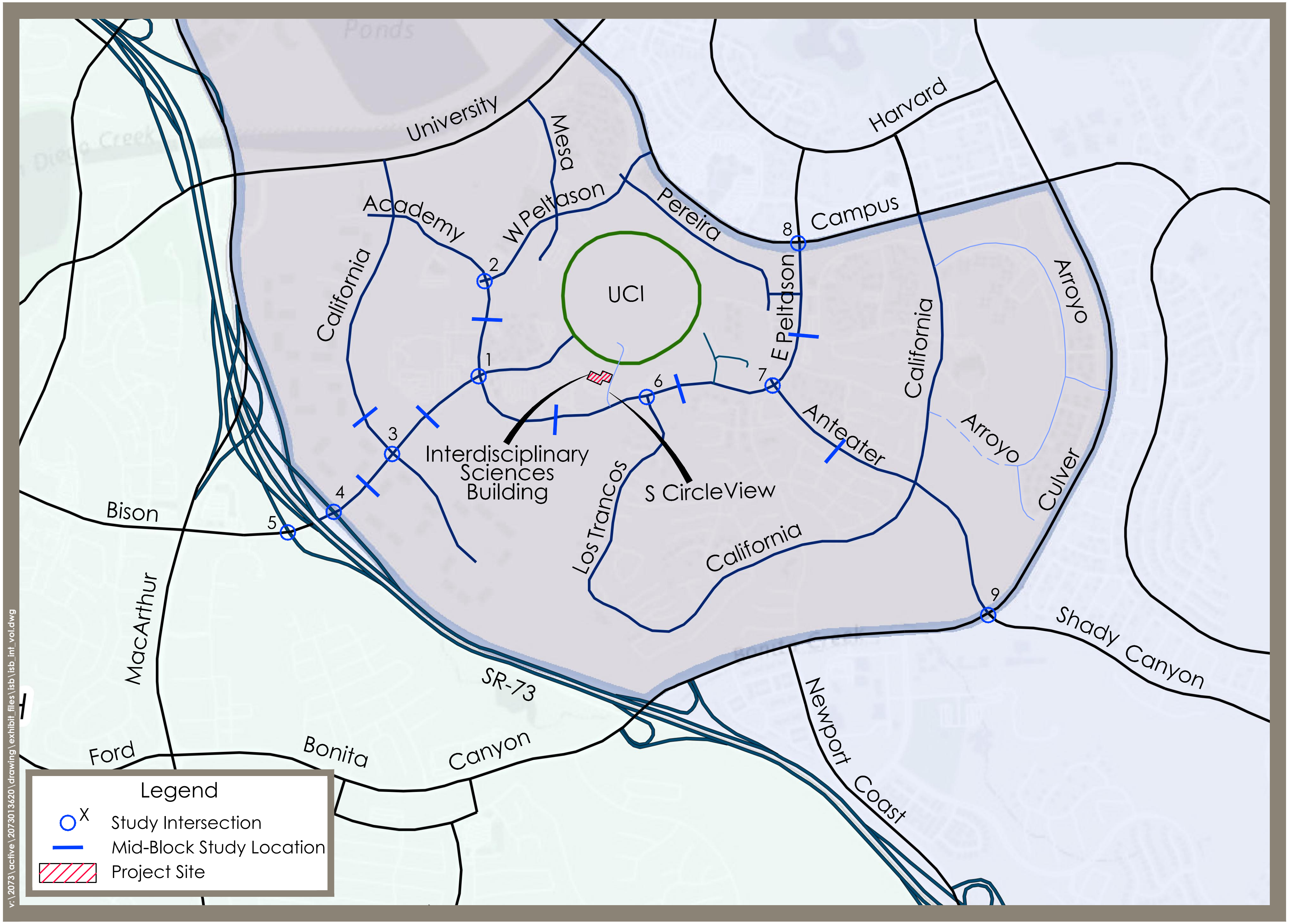


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Figure 1-3

Study Intersection Locations

2.0 TRANSPORTATION SETTING

This chapter describes the transportation setting for the proposed project. Existing and near-term (Year 2020) traffic conditions in the traffic analysis study area are summarized.

2.1 EXISTING ROADWAY SYSTEM

The study area encompasses five intersections within the UCI campus, three intersections along the perimeter of the campus in the surrounding City of Irvine, and one intersection in the City of Irvine. The four off-campus intersections are located along Campus Drive, Culver Drive, and Bison Avenue at the SR-73 Northbound Ramps and SR-73 Southbound Ramps and are all signalized. Two of the on-campus intersections are stop-controlled. Intersection lane configurations and intersection controls are illustrated in **Figure 2-1**.

East Peltason Drive begins opposite Berkeley Avenue at Campus Drive and changes names to West Peltason Drive at the Bison Avenue intersection. It loops through the UCI campus to opposite Bridge Road at Campus Drive. Peltason Drive is a two-lane local street through most of the campus with a raised median, and a four-lane local street with a raised median from Pereira Drive to Berkeley Avenue. The speed limit is 30 mph. On-street parking is not allowed and a striped bike lane is provided.

South Circle View Drive is an unstriped two-lane local street. It runs through the Physical Sciences Building and Multipurpose Science and Technology Building parking lot from East Peltason Drive to Fredrick Reines Hall. It spans less than 1,000 feet in length.

Campus Drive is designated as a Primary Arterial on the City of Irvine and the Orange County Master Plan of Arterial Highways (MPAH). Campus Drive begins at Bristol Street and runs in a generally northeast direction until reaching MacArthur Boulevard where it continues in a southeast direction to east of Culver Drive. Campus Drive provides four travel lanes with a raised median through the study area and represents the northeast boundary of the UCI main campus. The speed limit is 45 mph in the vicinity of the project. On-street parking is not allowed, and a striped bike lane is provided.

Culver Drive runs generally northeast to southwest from Portola Parkway in northeast Irvine to Michelson Drive where it curves toward the south between Michelson Drive and University Drive. South of University Drive, it curves southeast and then west around the eastern and southern boundary of the UCI campus, at which point Culver Drive becomes Bonita Canyon Drive west of Shady Canyon Drive/Anteater Drive. Bonita Canyon Drive continues west into the City of Newport Beach and becomes Ford Road west of MacArthur Boulevard. Bonita Canyon Drive provides full access to SR-73. Culver Drive is a Major Arterial north of Campus Drive and a Primary Arterial south of Campus Drive. Bonita Canyon Drive is designated as a Primary Arterial. Culver Drive/Bonita Canyon Drive provides four lanes with a raised median, except for a short section near the SR-73 Toll Road where the roadway varies from five to six lanes. On-street parking is

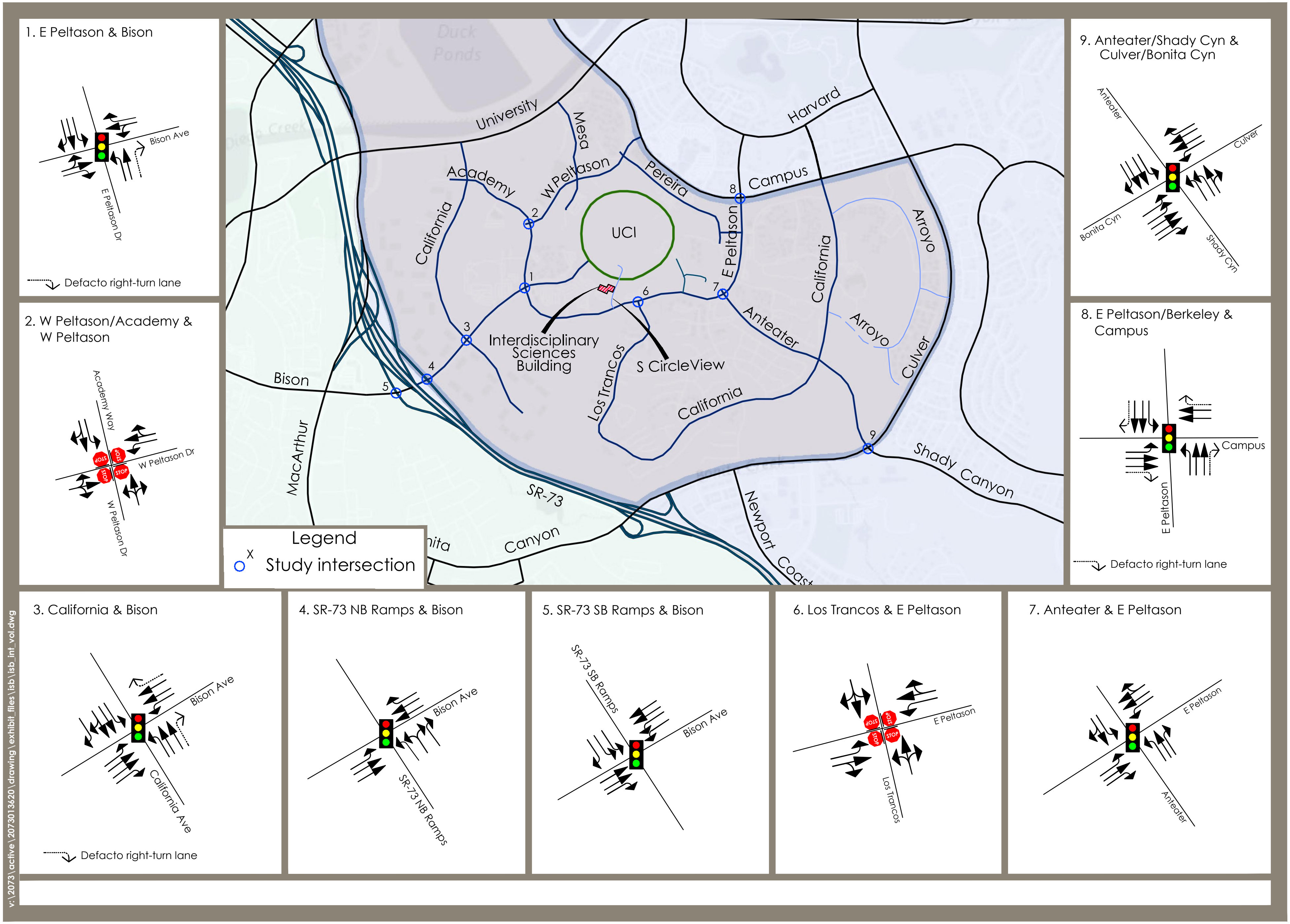

Figure 2-1

Existing Intersection Lane Configurations and Traffic Control

prohibited and a striped bike lane is provided. The speed limit on Culver Drive is 50 mph north of Campus Drive and 55 mph south of Campus Drive, and the speed limit on Bonita Canyon Drive is 50 mph.

California Avenue is designated as a Primary Arterial and runs from University Drive to Health Sciences Road. It provides four travel lanes with a raised median. The speed limit is 35 mph from Bison Avenue to Health Science Road; 45 mph from University Drive to Bison Avenue. On-street parking is not allowed, and a striped bike lane is provided. California Avenue begins on-campus again at the end of Los Trancos Drive south of the project site, and continues in a generally northeast direction until Anteater Drive where it turns toward the north and terminates north of the UCI campus at Harvard Avenue. California Avenue is designated as a Primary Arterial. It is a two-lane road between Los Trancos Drive and Adobe Circle, and a four-lane road north of Adobe Circle. On-street parking is prohibited, and a striped bike lane is provided. The speed limit is 35 mph south and 40 mph north of Adobe Circle South.

Bison Avenue is designated as a Primary Arterial on the City of Irvine and the Orange County Master Plan of Arterial Highways (MPAH). Bison Avenue begins on-campus at the Inner Ring Road to Bamboo Street. It provides four travel lanes with a raised median from Jamboree Road to East Peltason Drive. The speed limit is 40 mph in the vicinity. On-street parking is not allowed, and a striped bike lane is provided.

The project site can be accessed from East Peltason Drive by means of South Circle View Drive, which is a full access one-way stop controlled T-intersection, located on north side of the East Peltason Drive. A right turn-in only driveway and a right turn-out only driveway located approximately 520 feet and 1,000 feet west of the South Circle View Drive, respectively, can also be used to access the proposed project.

2.2 EXISTING VOLUMES

Existing ADT and peak hour volumes were counted in late 2016 and early 2017 while classes were in session. ADT volumes were counted for key roadway segments on campus along Peltason Drive, Bison Avenue and Anteater, and existing peak hour turning movement volumes were collected at the existing study intersections. **Figure 2-2** illustrates the existing study area ADT and AM peak hour volumes. **Figure 2-3** illustrates the existing PM peak hour volumes. Actual count data is included in **Appendix A**.

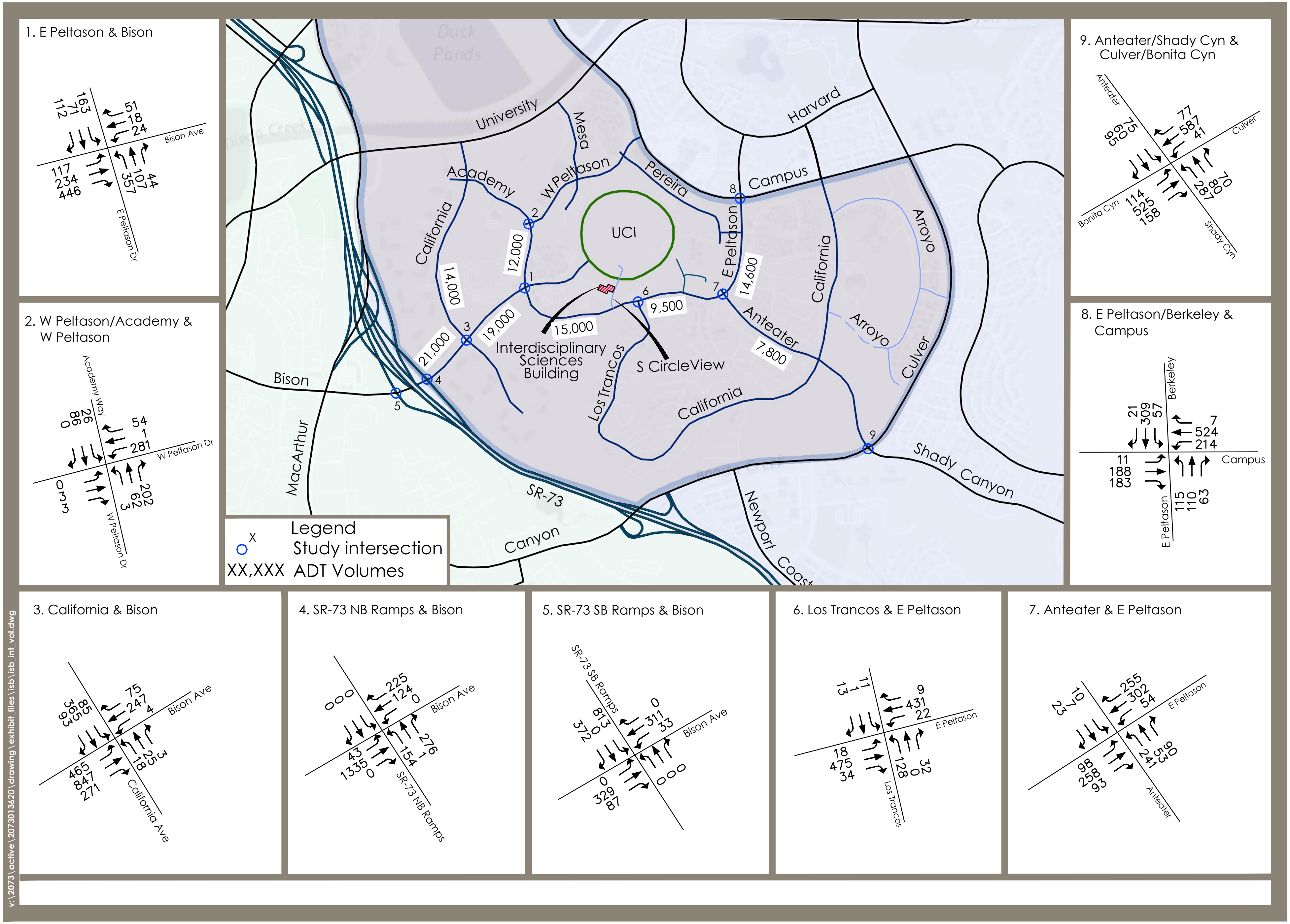

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Figure 2-2

Existing ADT and AM Peak Hour Volumes

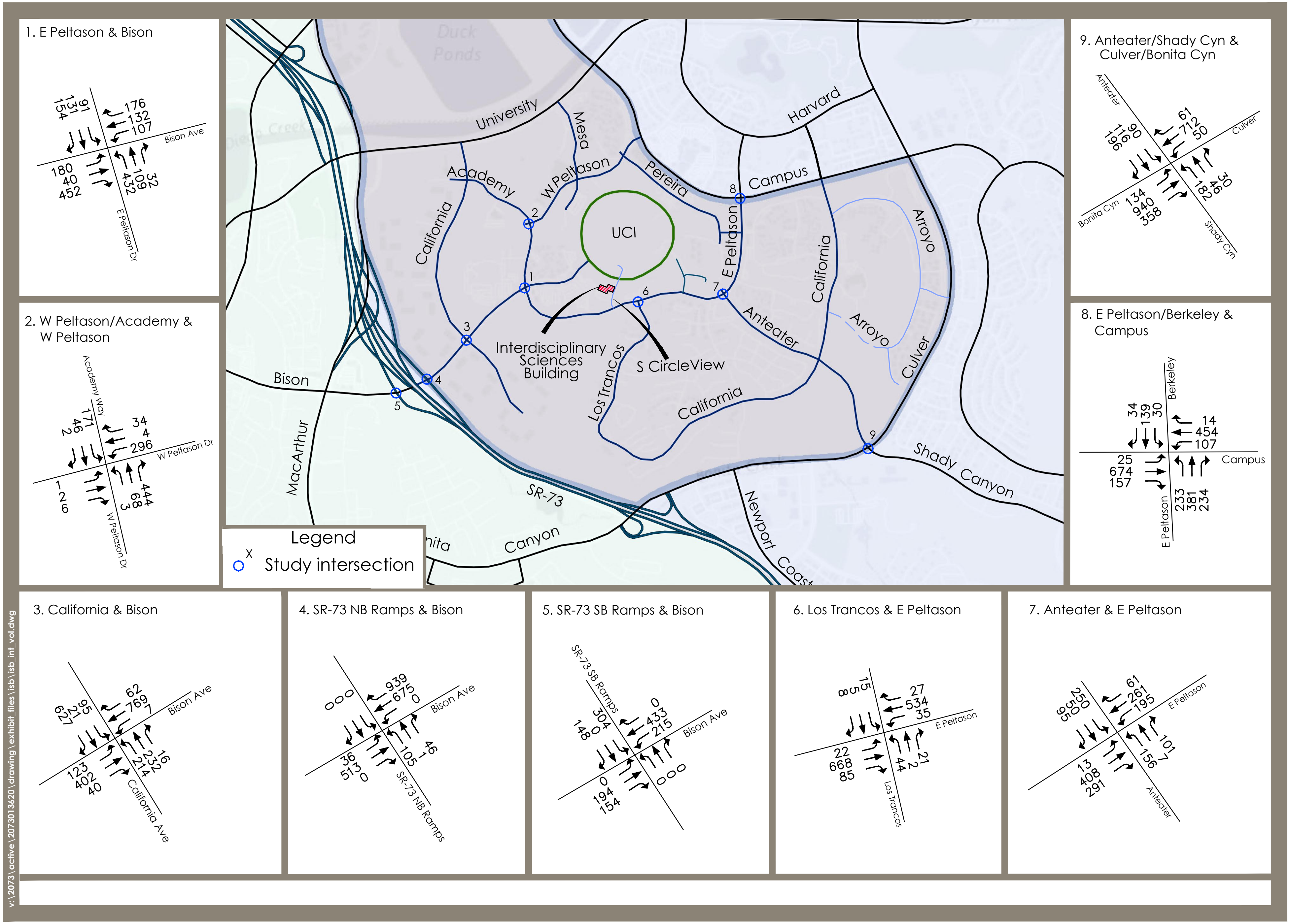

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Figure 2-3

Existing PM Peak Hour Volumes

2.3 EXISTING INTERSECTION LEVELS OF SERVICE

Existing ICU values were calculated for the signalized study intersections based on the AM and PM peak hour turning movement counts presented above and the existing lane configurations.

For the stop-controlled study intersections, the HCM delay methodology was used. The average delay is rounded to the nearest second to allow for minor fluctuations in daily traffic volumes, which is appropriate for planning purposes.

Existing AM and PM peak hour ICU and delay values are summarized in **Table 2-1** (actual ICU calculation worksheets are included in **Appendix B,** and delay calculations are included in **Appendix C**). As this table shows, the signalized study intersections currently operate at LOS A and LOS B during the AM and PM peak hours based on the ICU methodology. The stop-controlled study intersections are currently operating at LOS C and unacceptable LOS F during AM Peak hour; unacceptable LOS E and LOS F during the PM peak hour.

Table 2-1 Existing Intersection LOS Summary

Intersection	Jurisdiction	AM Peak Hour		PM Peak Hour	
		ICU/Delay	LOS	ICU/Delay	LOS
ICU Methodology - Signalized Intersections					
1. E Peltason Dr & Bison Ave	UCI	0.52	A	0.63	B
3. California Ave & Bison Ave	UCI	0.51	A	0.61	B
4. SR-73 NB Ramps & Bison Ave	Irvine	0.52	A	0.63	B
5. SR-73 SB Ramps & Bison Ave	Irvine	0.40	A	0.27	A
7. Anteater & E Peltason	UCI	0.43	A	0.58	A
8. E Peltason/Berkeley & Campus	Irvine	0.40	A	0.49	A
9. Anteater/Shady Canyon & Culver	Irvine	0.38	A	0.45	A
HCM Delay Methodology - Stop Controlled Intersections					
2. W Peltason Dr/Academy & W Peltason Dr	UCI	15 sec	C	40 sec	E
6. Los Trancos & E Peltason	UCI	53 sec	F	130 sec	F

2.4 NEAR-TERM (YEAR 2020) TRAFFIC FORECAST VOLUMES

The near-term baseline volumes for this analysis are calculated by applying a growth factor of two percent per year to the existing counts. The growth rate is an average of the Housing Units, Population and Employment projections per year for the Community Analysis Area 50 (Irvine). The datasets are obtained from Orange County Projections 2014-Modified dataset released in June 2016.

Figure 2-4 illustrates 2020 ADT and AM peak hour intersection volumes. **Figure 2-5** illustrates 2020 PM peak hour intersection volumes.

Table 2-2 summarizes the 2020 AM and PM peak hour ICU and delay values at the study intersections. All the signalized study intersections would operate at LOS A and LOS B during the AM and PM peak hours. The stop controlled intersections would operate at LOS C and unacceptable LOS F during AM peak hour; unacceptable LOS E and LOS F during PM peak hour.

It should be noted that the two existing stopped controlled intersections of W Peltason Drive at Academy Way and Los Trancos at East Peltason Drive have previously been identified for installation of a traffic signal in the LRDP, which would improve the LOS.

Table 2-2 2020 No-Project Intersection LOS Summary

Intersection	Jurisdiction	AM Peak Hour		PM Peak Hour	
		ICU/Delay	LOS	ICU/Delay	LOS
ICU Methodology - Signalized Intersections					
1. E Peltason Dr & Bison Ave	UCI	0.54	A	0.66	B
3. California Ave & Bison Ave	UCI	0.54	A	0.64	B
4. SR-73 NB Ramps & Bison Ave	Irvine	0.56	A	0.67	B
5. SR-73 SB Ramps & Bison Ave	Irvine	0.41	A	0.28	A
7. Anteater & E Peltason	UCI	0.45	A	0.61	B
8. E Peltason/Berkeley & Campus	Irvine	0.41	A	0.52	A
9. Anteater/Shady Canyon & Culver	Irvine	0.41	A	0.48	A
HCM Delay Methodology - Stop Controlled Intersections					
2. W Peltason Dr/Academy & W Peltason Dr	UCI	17 sec	C	50 sec	F
6. Los Trancos & E Peltason	UCI	74 sec	F	157 sec	F

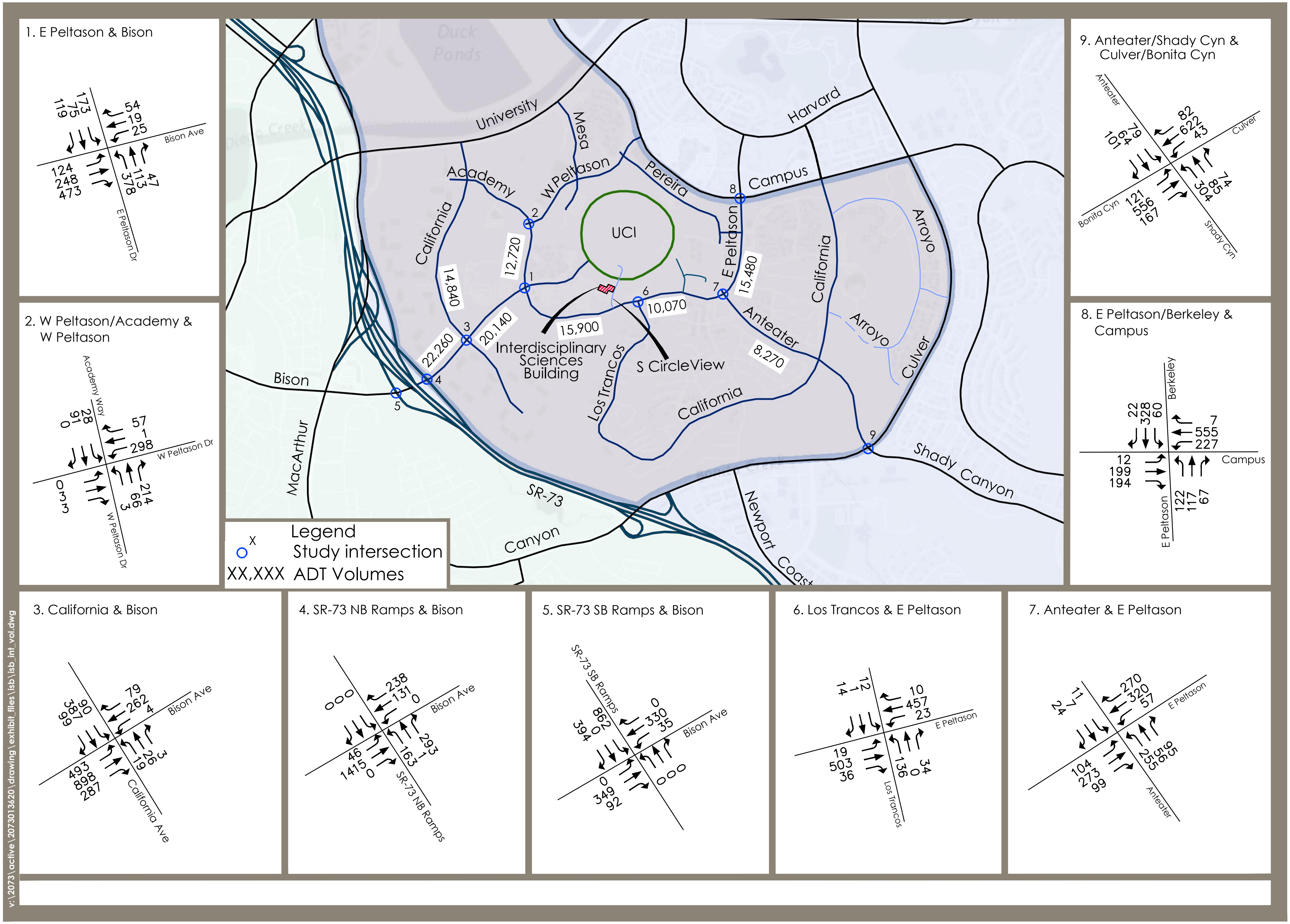

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Figure 2-4

2020 No-Project ADT and AM Peak Hour Volumes

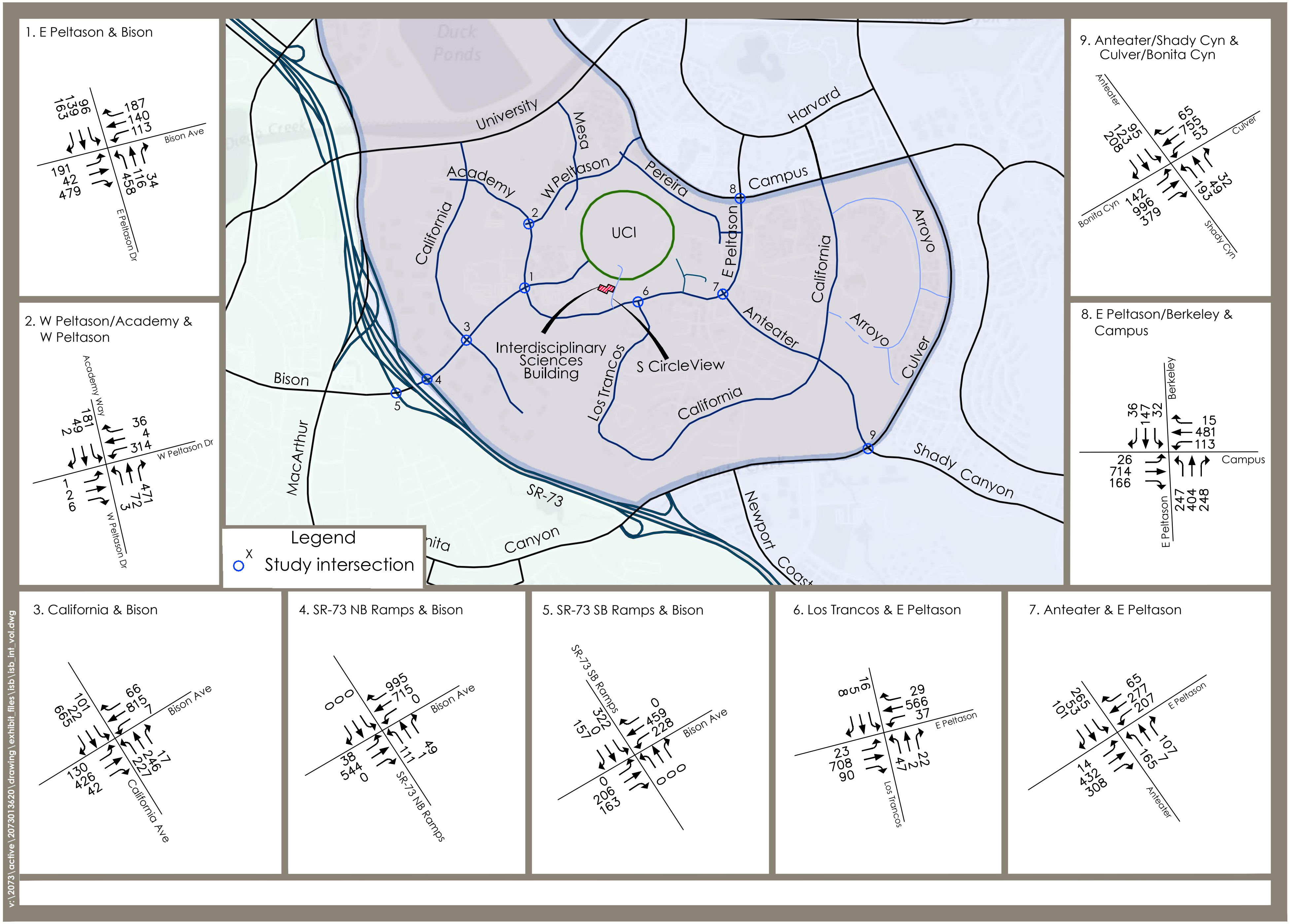

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Figure 2-5

2020 No-Project PM Peak Hour Volumes

3.0 PROJECT DESCRIPTION

This chapter describes the traffic characteristics of the proposed project. Trip generation for the project is summarized and the distribution of project trips on the study area circulation system is presented.

3.1 PROJECT DESCRIPTION

The project site is located on the site of an existing surface parking lot, west of South Circle View Drive as shown in **Figure 1-1**. The proposed project would demolish the existing 160,000 gross square-foot 12B surface parking lot to construct a 200,000 gross square-foot eight-story structure with a mechanical penthouse on an approximately 3.5-acre site. The construction would start in April 2018 and would be completed over two years. The anticipated campus population increase due to the proposed project is approximately 70 new faculty and staff. The project is not expected to increase the student population. The site development plan for the proposed project is illustrated in **Figure 1-2.**

The current UCI Long Range Development Plan (LRDP) adopted in 2007, established a land use plan and physical planning framework to accommodate projected enrollment levels, additional academic facilities and housing, and the on-campus circulation system through the 2025-2026 horizon year. The project site is designated in the LRDP land use as an Academic and Support Facilities.

3.2 TRIP GENERATION

Trip generation rates for the proposed project are based on the UCI Main Campus Traffic Model trip rates for Faculty (UCI MCTM LRDP Update 2007 Trip Rate Summary is included in **Appendix D**). **Table 3-1** summarizes the trip rates and the resulting anticipated trip generation for the proposed project. As shown in the table, the project would generate a total of 113 daily trips (UCI Staff proportion of commuters is 70 faculty x 0.85 = 60; UCI staff person trips per commute = 60 x 1.9 =113), of which 10 would occur during the AM peak hour and the PM peak hour.

Table 3-1 Proposed Project Trip Generation Summary

ADT Trip Rates for Faculty

Category	Unit	Proportion of Commuters	Person Trips/Commuter
1. Faculty	person	0.85	1.9

Source: UCI LRDP Update 2007

Peak Hour Trip Rates (Percent of ADT)

	AM Peak Hour		PM Peak Hour	
Description	Inbound	Outbound	Inbound	Outbound
Academic	8.0%	0.7%	2.0%	7.5%

Source: UCI Main Campus Traffic Model (UCIMCTM)

Project Trip Generation

Category	Amount	AM Peak Hour			PM Peak Hour			ADT
		Inbound	Outbound	Total	Inbound	Outbound	Total	
Faculty	70	9	1	10	2	8	10	113
ADT = Average Daily Trips								

3.3 TRIP DISTRIBUTION

The trips generated by the project will use Peltason Drive, Campus Drive, California Avenue and Bison Avenue to access the surrounding streets.

Project trip distribution was determined based on ADT volume forecasts from the UCI MCTM. Approximately 65 percent of project trips are oriented toward the east on Peltason Drive continuing along Anteater and Campus Drive. Approximately 35 percent of project trips are oriented toward the west on Peltason Drive and continuing along Academy Way and Bison Avenue.

Figure 3-1 illustrates the general distribution for the proposed project. **Figure 3-2** and **Figure 3-3** illustrate the AM and PM peak hour project-generated trips, respectively, based on the distribution presented here.

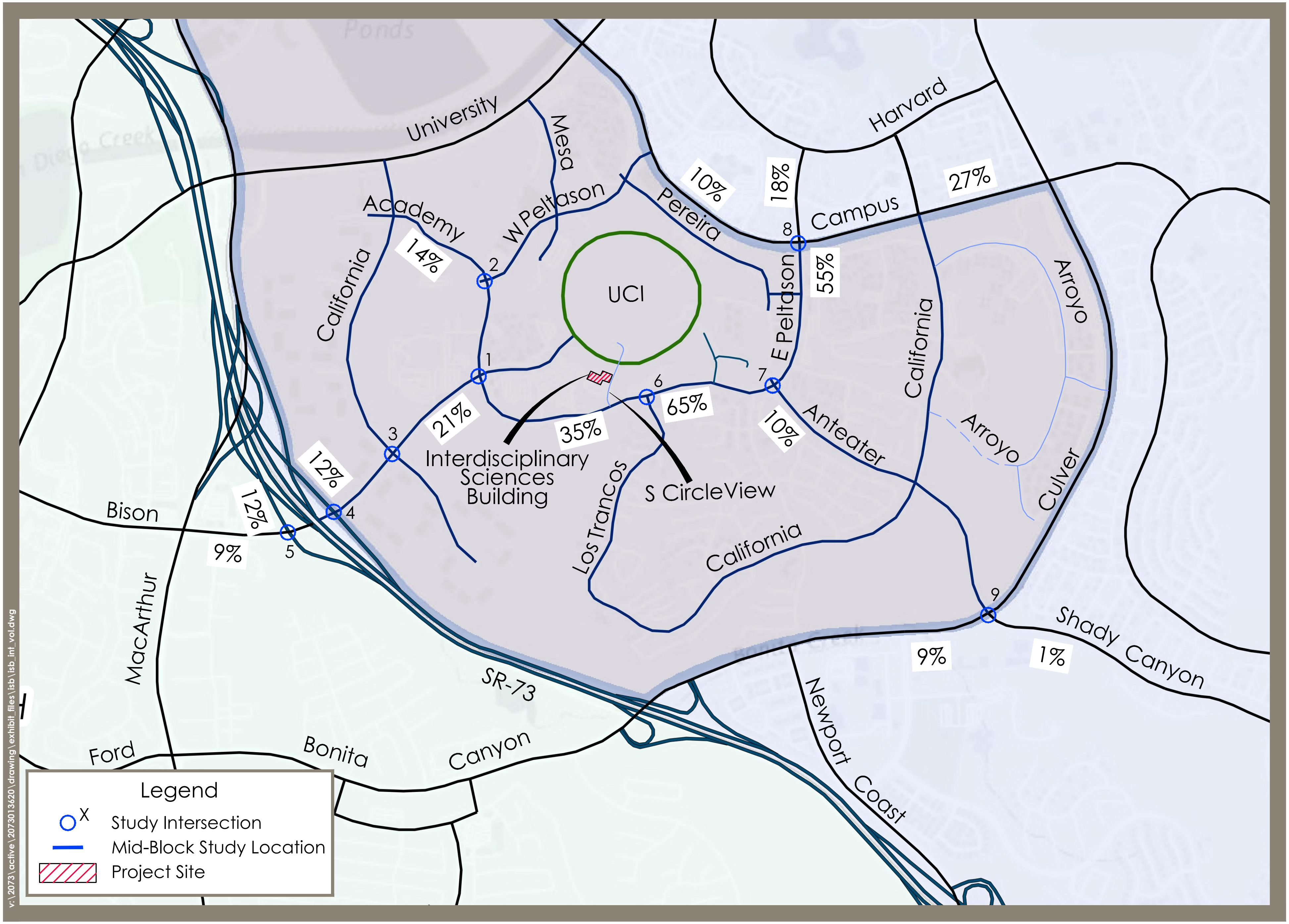

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Figure 3-1

General Project Distribution

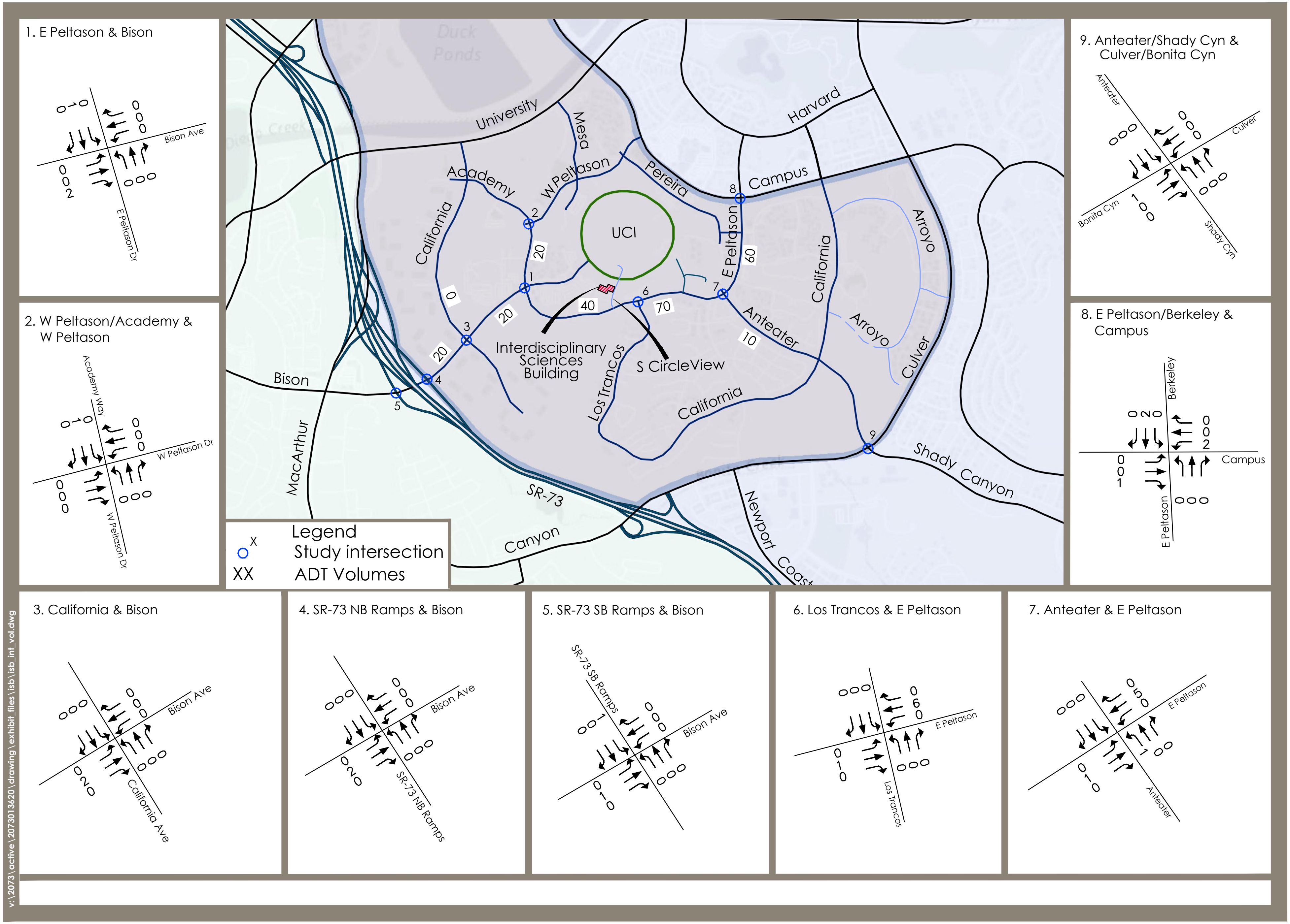

Figure 3-2

Project-Generated ADT and AM Peak Hour Trips

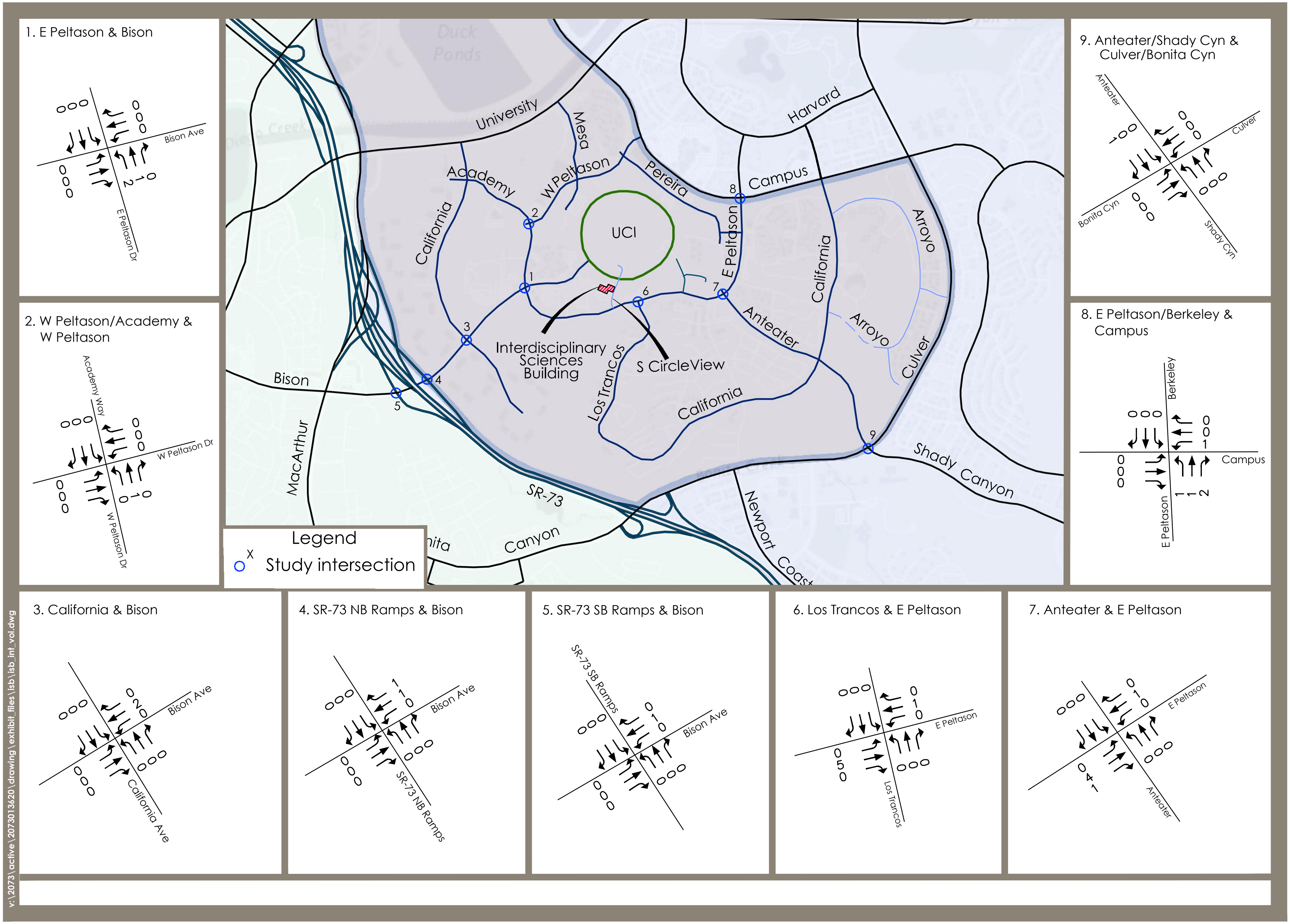

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Figure 3-3

Project-Generated PM Peak Hour Trips

4.0 IMPACT ANALYSIS

This chapter presents the with-project intersection volumes, and evaluates the project impacts on the study intersections. Project increases resulting in significant impacts, if any, are discussed and mitigation measures are identified if necessary.

4.1 NEAR-TERM (YEAR 2020) ANALYSIS

As discussed in **Section 3.2**, the proposed project would generate 113 average daily trips, 10 AM and 10 PM peak hour trips. **Figure 4-1** illustrates the 2020 with-project ADT and AM peak hour volumes, and **Figure 4-2** illustrates the 2020 with-project PM peak hour volumes.

Table 4-1 summarizes the 2020 with-project AM and PM peak hour ICU and delay values for the study intersections (the ICU calculation worksheets are included in **Appendix B**, and HCM delay calculation worksheets are included in **Appendix C**).

As shown in the table, with the addition of the proposed project, all the signalized study intersections would operate at LOS A and LOS B during the AM and PM peak hours. At the stop controlled intersections, West Peltason Drive/Academy Way at West Peltason Drive would operate at LOS C during the AM peak hour and unacceptable LOS F during the PM peak hour, Los Trancos at East Peltason Drive would operate at an unacceptable LOS F during both the AM and PM peak hours, for conditions with and without the project.

Table 4-1 2020 with-Project Intersection LOS Summary

Intersection	2020 No-Project				2020 with project			
	AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
	ICU/Delay	LOS	ICU/Delay	LOS	ICU/Delay	LOS	ICU/Delay	LOS
ICU Methodology - Signalized Intersections								
1. E Peltason Dr & Bison Ave	0.54	A	0.66	B	0.54	A	0.66	B
3. California Ave & Bison Ave	0.54	A	0.64	B	0.54	A	0.64	B
4. SR-73 NB Ramps & Bison Ave	0.56	A	0.67	B	0.56	A	0.67	B
5. SR-73 SB Ramps & Bison Ave	0.41	A	0.28	A	0.41	A	0.28	A
7. Anteater & E Peltason	0.45	A	0.61	B	0.46	A	0.62	B
8. E Peltason/Berkeley & Campus	0.41	A	0.52	A	0.41	A	0.52	A
9. Anteater/Shady Canyon & Culver	0.41	A	0.48	A	0.41	A	0.48	A
HCM Delay Methodology - Stop Controlled Intersections								
2. W Peltason Dr/Academy & W Peltason Dr	17 sec	C	50 sec	F	17 sec	C	51 sec	F
6. Los Trancos & E Peltason	74 sec	F	157 sec	F	76 sec	F	160 sec	F

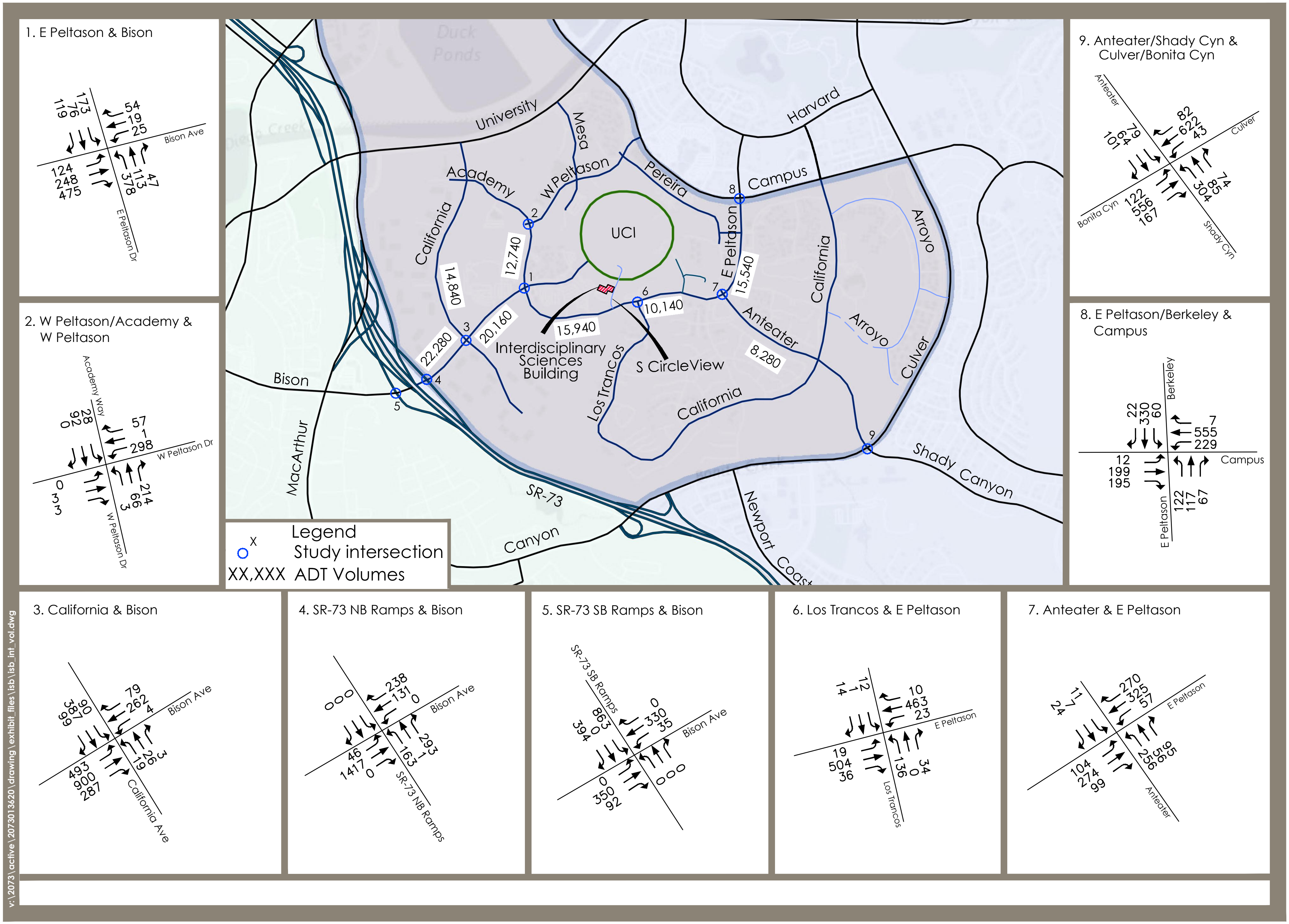

Figure 4-1

2020 With-Project ADT and AM Peak Hour Volumes

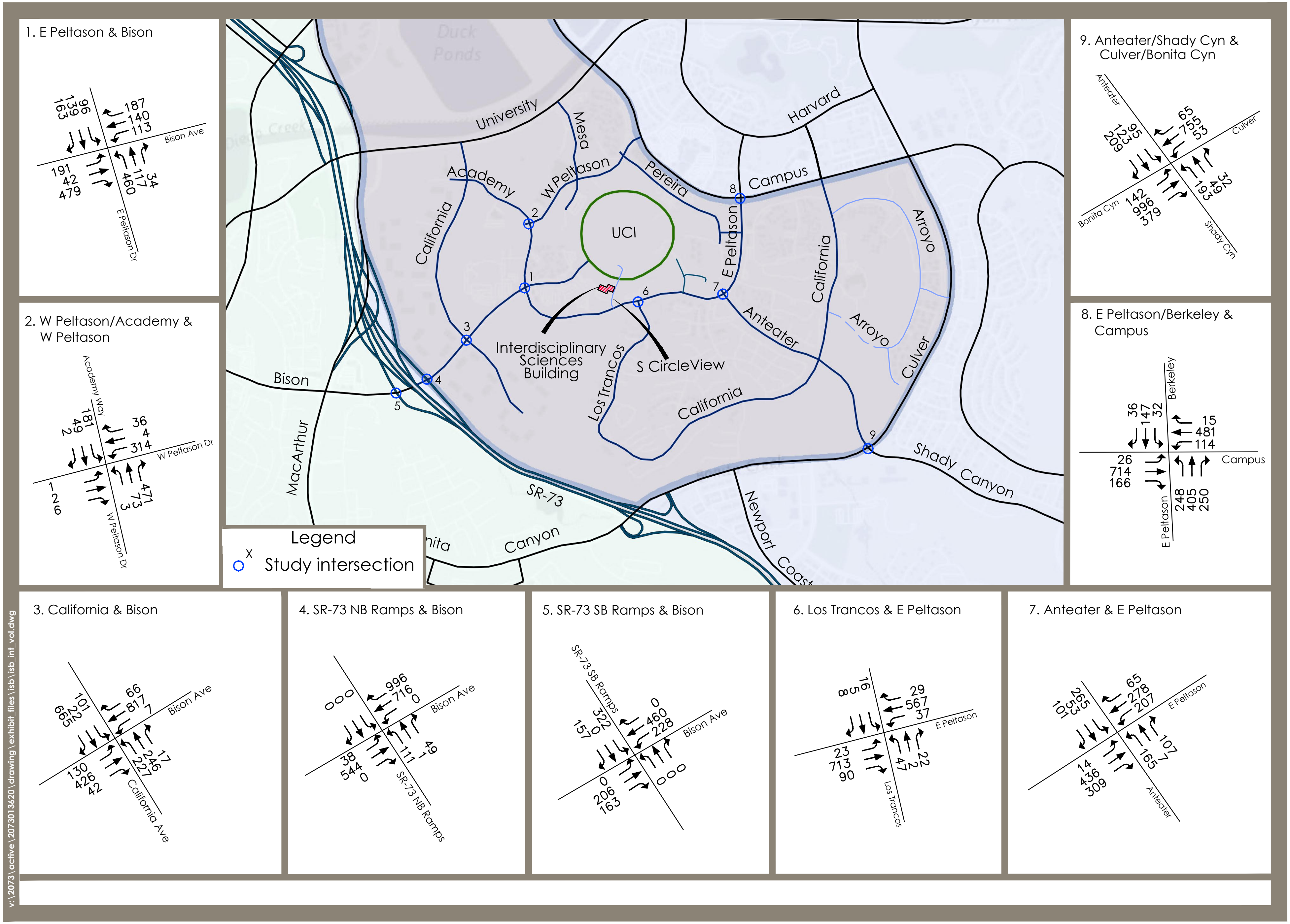

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Figure 4-2

2020 With-Project PM Peak Hour Volumes

As mentioned previously, for signalized intersections, significant impacts are defined as an increase of 0.02 or more in the ICU value that result in LOS E or LOS F conditions. For stop-controlled study intersections if the LOS reaches E or F, the intersection is evaluated further for possible improvements with a traffic signal.

Based on this performance criteria, the proposed project has no significant impact on the signalized study intersections under year 2020 conditions. The two existing stop-controlled intersections of West Peltason Drive/Academy Way at West Peltason Drive and Los Trancos at East Peltason Drive operate at an unacceptable LOS F but have previously been identified for installation of a traffic signal in the LRDP, which would improve the level of service to LOS A and LOS B (the ICU calculation worksheets are included in **Appendix B**).

4.2 CONCLUSIONS

The proposed ISB Project would demolish the existing 160,000 gross square-foot surface parking lot 12B, to construct a 200,000 gross square-foot, eight-story structure with a mechanical penthouse on an approximately 3.5-acre site. The anticipated campus population increase due to the proposed project is approximately 70 new faculty and staff. The project is not expected to increase the student population. The proposed project would generate approximately 113 daily trips, 10 trips during the AM peak hour, and 10 trips during the PM peak hour. Seven of the nine study area intersections are signal controlled and two are stop-controlled intersections.

None of the study area intersections are significantly impacted by the project. The signalized intersections under near-term conditions with the addition of the proposed project would operate at an acceptable LOS A and LOS B and hence have no significant impact.

The two stop-controlled intersections would operate at unacceptable LOS F without the project. The project generated trips are low and not noticeable (seven trips during the AM peak hour and seven trips during the PM peak hour). Therefore, no mitigation is necessary. With addition of the project, the stop-controlled intersections continue to operate at unacceptable LOS F but have previously been identified for installation of a traffic signal in the LRDP, which would improve the level of service to LOS A and LOS B.

In conclusion, the project has no significant impact on the surrounding circulation system under the near-term (year 2020) conditions.

Appendix A COUNT DATA

Transportation Studies, Inc.
2640 Walnut Avenue, Suite L
Tustin, CA. 92780

City: IRVINE
N-S Direction: PELTASON DRIVE
E-W Direction: BISON AVENUE

File Name : H1701020
Site Code : 00000000
Start Date : 1/25/2017
Page No : 1

Groups Printed- Turning Movements

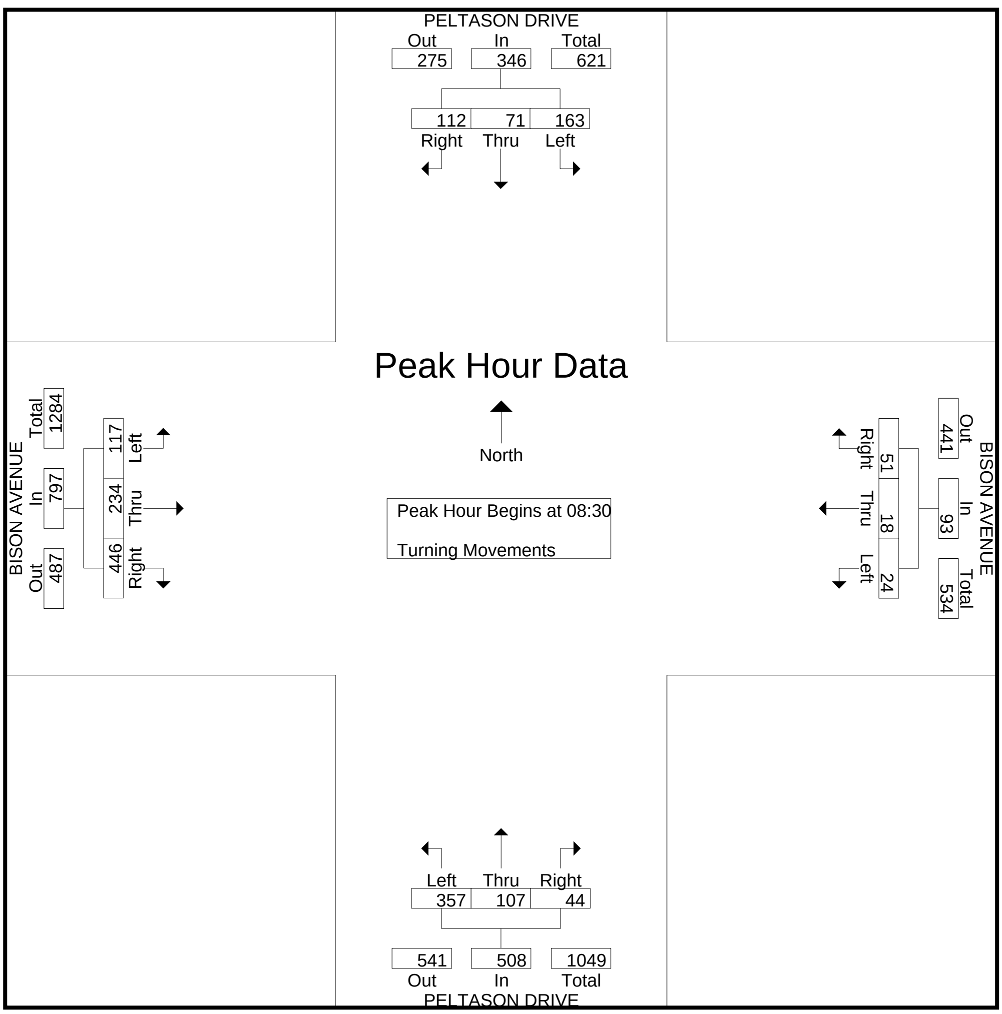
	PELTASON DRIVE Southbound			BISON AVENUE Westbound			PELTASON DRIVE Northbound			BISON AVENUE Eastbound			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
08:00	22	17	29	14	4	6	3	25	89	92	33	37	371
08:15	26	8	23	4	7	3	5	21	76	94	36	27	330
08:30	25	19	43	7	5	4	15	19	81	113	65	32	428
08:45	25	21	64	19	4	8	12	43	94	139	78	43	550
Total	98	65	159	44	20	21	35	108	340	438	212	139	1679
09:00	30	14	22	14	6	9	10	24	99	113	40	18	399
09:15	32	17	34	11	3	3	7	21	83	81	51	24	367
09:30	27	15	42	6	11	3	8	20	70	108	69	20	399
09:45	34	21	62	28	19	12	20	41	87	81	63	25	493
Total	123	67	160	59	39	27	45	106	339	383	223	87	1658
*** BREAK ***													
16:30	45	19	14	34	30	16	9	27	83	97	15	22	411
16:45	25	35	38	51	35	23	11	32	93	108	12	34	497
Total	70	54	52	85	65	39	20	59	176	205	27	56	908
17:00	51	40	19	59	52	32	12	37	149	121	6	37	615
17:15	40	27	17	40	19	27	2	26	93	117	10	53	471
17:30	38	29	17	26	26	25	7	14	97	106	12	56	453
17:45	26	23	27	32	24	36	20	34	90	100	11	46	469
Total	155	119	80	157	121	120	41	111	429	444	39	192	2008
18:00	39	26	9	58	45	42	14	24	92	109	10	39	507
18:15	18	29	12	30	24	24	9	27	81	112	12	43	421
Grand Total	503	360	472	433	314	273	164	435	1457	1691	523	556	7181
Apprch %	37.7	27	35.4	42.5	30.8	26.8	8	21.2	70.9	61	18.9	20.1	
Total %	7	5	6.6	6	4.4	3.8	2.3	6.1	20.3	23.5	7.3	7.7	

Transportation Studies, Inc.
2640 Walnut Avenue, Suite L
Tustin, CA. 92780

City: IRVINE
N-S Direction: PELTASON DRIVE
E-W Direction: BISON AVENUE

File Name : H1701020
Site Code : 00000000
Start Date : 1/25/2017

	PELTASON DRIVE Southbound				BISON AVENUE Westbound				PELTASON DRIVE Northbound				BISON AVENUE Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 08:00 to 09:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:30																	
08:30	25	19	43	87	7	5	4	16	**15**	19	81	115	113	65	32	210	428
08:45	25	**21**	**64**	**110**	**19**	4	8	**31**	12	**43**	94	**149**	**139**	**78**	**43**	**260**	**550**
09:00	30	14	22	66	14	**6**	**9**	29	10	24	**99**	133	113	40	18	171	399
09:15	**32**	17	34	83	11	3	3	17	7	21	83	111	81	51	24	156	367
Total Volume	112	71	163	346	51	18	24	93	44	107	357	508	446	234	117	797	1744
% App. Total	32.4	20.5	47.1		54.8	19.4	25.8		8.7	21.1	70.3		56	29.4	14.7		
PHF	.875	.845	.637	.786	.671	.750	.667	.750	.733	.622	.902	.852	.802	.750	.680	.766	.793

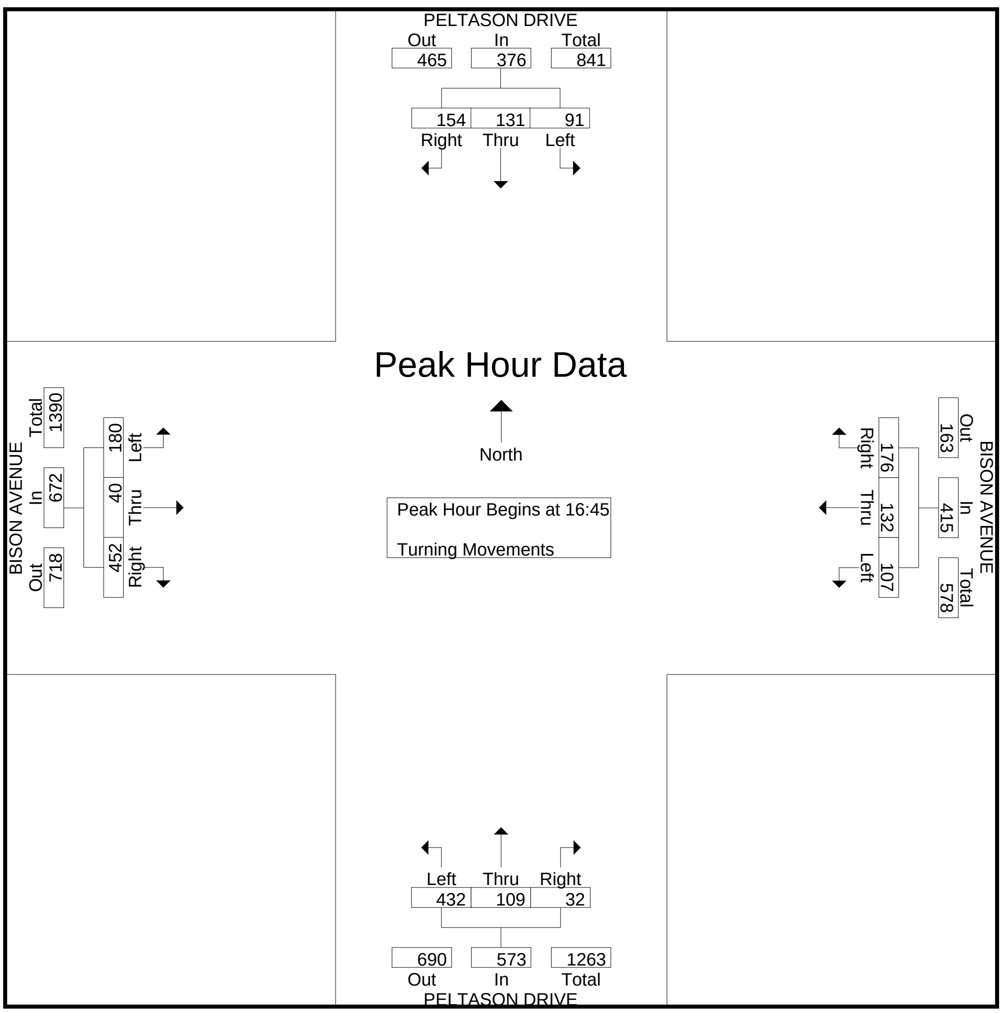


Transportation Studies, Inc.
2640 Walnut Avenue, Suite L
Tustin, CA. 92780

City: IRVINE
N-S Direction: PELTASON DRIVE
E-W Direction: BISON AVENUE

File Name : H1701020
Site Code : 00000000
Start Date : 1/25/2017
Page No : 3

	PELTASON DRIVE Southbound				BISON AVENUE Westbound				PELTASON DRIVE Northbound				BISON AVENUE Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 16:30 to 18:15 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 16:45																	
16:45	25	35	**38**	98	51	35	23	109	11	32	93	136	108	**12**	34	154	497
17:00	**51**	**40**	19	**110**	**59**	**52**	**32**	**143**	**12**	**37**	**149**	**198**	**121**	6	37	164	**615**
17:15	40	27	17	84	40	19	27	86	2	26	93	121	117	10	53	**180**	471
17:30	38	29	17	84	26	26	25	77	7	14	97	118	106	12	**56**	174	453
Total Volume	154	131	91	376	176	132	107	415	32	109	432	573	452	40	180	672	2036
% App. Total	41	34.8	24.2		42.4	31.8	25.8		5.6	19	75.4		67.3	6	26.8		
PHF	.755	.819	.599	.855	.746	.635	.836	.726	.667	.736	.725	.723	.934	.833	.804	.933	.828



Transportation Studies, Inc.
2640 Walnut Avenue, Suite L
Tustin, CA. 92780

City: IRVINE
N-S Direction: W. PELTASON DR/ ACADEMY
E-W Direction: W. PELTASON DRIVE

File Name : H1701021
Site Code : 00000000
Start Date : 1/25/2017
Page No : 1

Groups Printed- Turning Movements

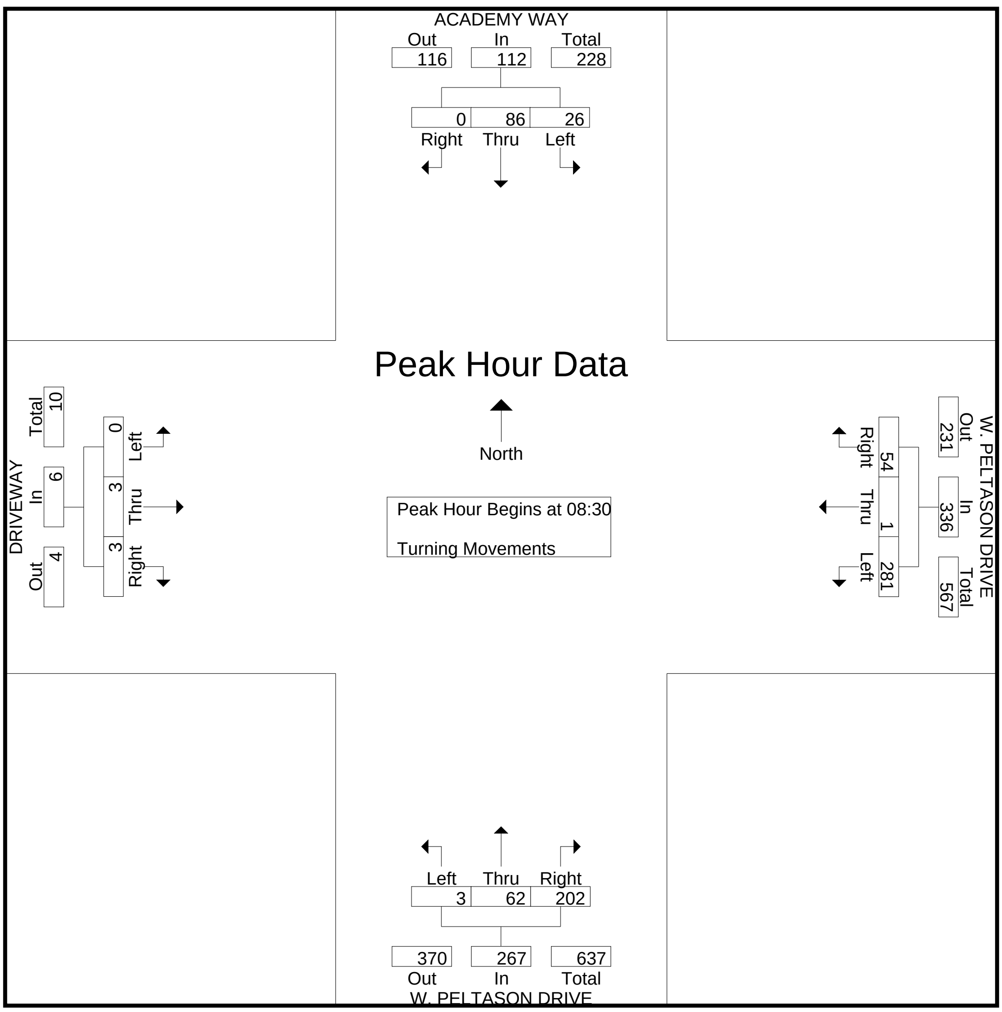
	ACADEMY WAY Southbound			W. PELTASON DRIVE Westbound			W. PELTASON DRIVE Northbound			DRIVEWAY Eastbound			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
08:00	0	17	6	11	3	53	52	14	0	0	4	0	160
08:15	0	11	7	8	1	55	35	14	1	0	0	1	133
08:30	0	29	5	11	0	69	47	10	0	1	1	0	173
08:45	0	20	5	19	0	92	66	24	0	0	0	0	226
Total	0	77	23	49	4	269	200	62	1	1	5	1	692
09:00	0	15	9	16	1	55	49	13	3	2	1	0	164
09:15	0	22	7	8	0	65	40	15	0	0	1	0	158
09:30	0	29	11	8	2	64	35	5	0	0	1	1	156
09:45	0	23	12	8	0	93	80	17	2	0	0	0	235
Total	0	89	39	40	3	277	204	50	5	2	3	1	713
*** BREAK ***													
16:30	0	12	15	10	2	70	70	18	1	1	1	1	201
16:45	0	7	20	4	0	80	107	15	0	0	1	0	234
Total	0	19	35	14	2	150	177	33	1	1	2	1	435
17:00	1	15	43	10	1	84	128	23	1	3	1	0	310
17:15	1	14	53	11	1	69	105	17	2	3	0	0	276
17:30	0	8	32	8	2	72	102	13	0	0	0	1	238
17:45	0	9	43	5	0	71	109	15	0	0	1	0	253
Total	2	46	171	34	4	296	444	68	3	6	2	1	1077
18:00	0	3	28	9	2	65	108	22	0	0	1	0	238
18:15	0	13	17	9	1	46	95	18	0	0	0	0	199
Grand Total	2	247	313	155	16	1103	1228	253	10	10	13	4	3354
Apprch %	0.4	44	55.7	12.2	1.3	86.6	82.4	17	0.7	37	48.1	14.8	
Total %	0.1	7.4	9.3	4.6	0.5	32.9	36.6	7.5	0.3	0.3	0.4	0.1	

Transportation Studies, Inc.
2640 Walnut Avenue, Suite L
Tustin, CA. 92780

City: IRVINE
N-S Direction: W. PELTASON DR/ ACADEMY
E-W Direction: W. PELTASON DRIVE

File Name : H1701021
Site Code : 00000000
Start Date : 1/25/2017
Page No : 2

	ACADEMY WAY Southbound				W. PELTASON DRIVE Westbound				W. PELTASON DRIVE Northbound				DRIVEWAY Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 08:00 to 09:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:30																	
08:30	0	**29**	5	**34**	11	0	69	80	47	10	0	57	1	**1**	0	2	173
08:45	0	20	5	25	**19**	0	**92**	**111**	**66**	**24**	0	**90**	0	0	0	0	**226**
09:00	0	15	**9**	24	16	**1**	55	72	49	13	**3**	65	**2**	1	0	**3**	164
09:15	0	22	7	29	8	0	65	73	40	15	0	55	0	1	0	1	158
Total Volume	0	86	26	112	54	1	281	336	202	62	3	267	3	3	0	6	721
% App. Total	0	76.8	23.2		16.1	0.3	83.6		75.7	23.2	1.1		50	50	0		
PHF	.000	.741	.722	.824	.711	.250	.764	.757	.765	.646	.250	.742	.375	.750	.000	.500	.798

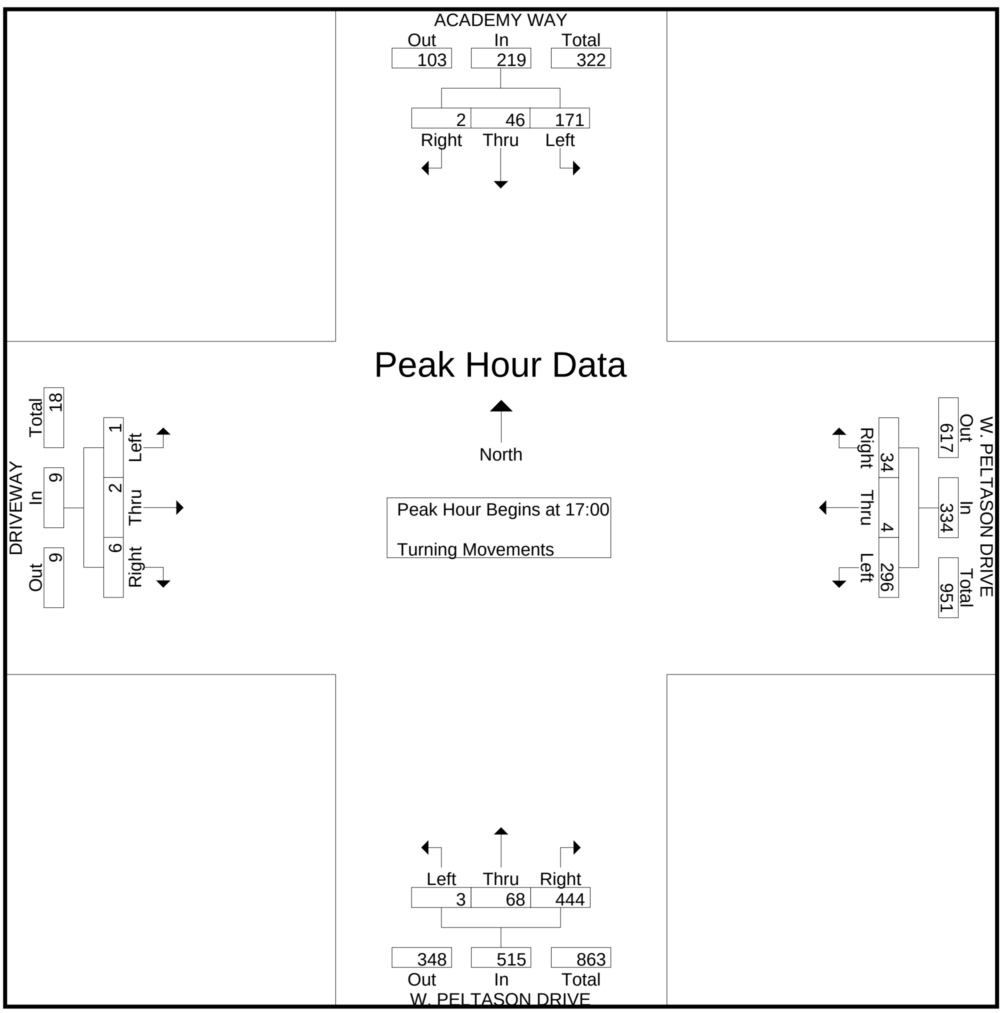


Transportation Studies, Inc.
2640 Walnut Avenue, Suite L
Tustin, CA. 92780

City: IRVINE
N-S Direction: W. PELTASON DR/ ACADEMY
E-W Direction: W. PELTASON DRIVE

File Name : H1701021
Site Code : 00000000
Start Date : 1/25/2017
Page No : 3

	ACADEMY WAY Southbound				W. PELTASON DRIVE Westbound				W. PELTASON DRIVE Northbound				DRIVEWAY Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 16:30 to 18:15 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 17:00																	
17:00	**1**	**15**	43	59	10	1	**84**	**95**	**128**	**23**	1	**152**	**3**	**1**	0	**4**	**310**
17:15	1	14	**53**	**68**	**11**	1	69	81	105	17	**2**	124	3	0	0	3	276
17:30	0	8	32	40	8	**2**	72	82	102	13	0	115	0	0	**1**	1	238
17:45	0	9	43	52	5	0	71	76	109	15	0	124	0	1	0	1	253
Total Volume	2	46	171	219	34	4	296	334	444	68	3	515	6	2	1	9	1077
% App. Total	0.9	21	78.1		10.2	1.2	88.6		86.2	13.2	0.6		66.7	22.2	11.1		
PHF	.500	.767	.807	.805	.773	.500	.881	.879	.867	.739	.375	.847	.500	.500	.250	.563	.869



Transportation Studies, Inc.
2640 Walnut Avenue, Suite L
Tustin, CA. 92780

City: IRVINE
N-S Direction: CALIFORNIA AVENUE
E-W Direction: BISON AVENUE

File Name : H1701019
Site Code : 00000000
Start Date : 1/25/2017
Page No : 1

Groups Printed- Turning Movements

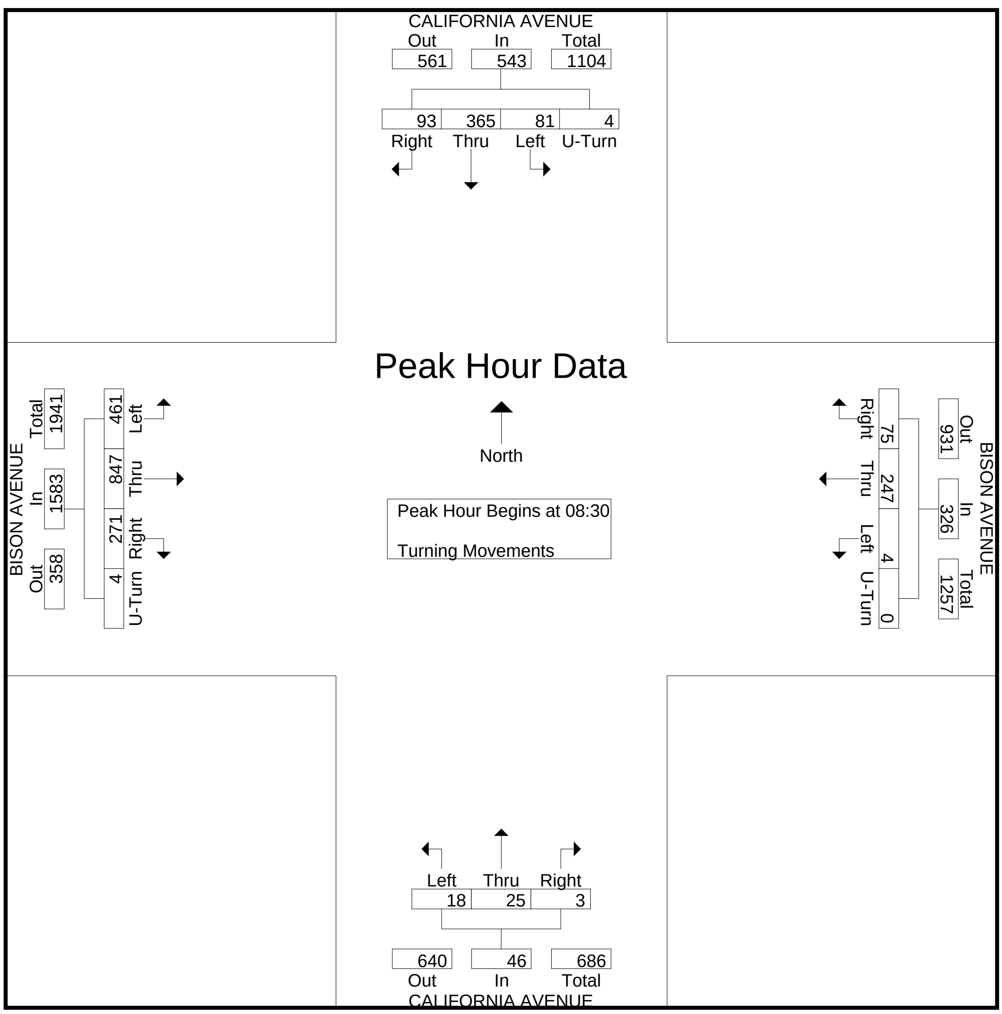
	CALIFORNIA AVENUE Southbound				BISON AVENUE Westbound				CALIFORNIA AVENUE Northbound			BISON AVENUE Eastbound				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	Right	Thru	Left	U-Turn	Int. Total
08:00	10	42	17	1	16	62	0	0	0	2	4	39	159	148	0	500
08:15	14	61	11	2	22	57	5	0	3	2	5	49	173	135	1	540
08:30	19	62	16	0	17	66	0	0	1	1	7	50	215	138	1	593
08:45	16	73	25	3	21	63	2	0	1	4	2	59	271	148	2	690
Total	59	238	69	6	76	248	7	0	5	9	18	197	818	569	4	2323
09:00	31	104	17	1	24	63	2	0	0	9	3	75	187	102	1	619
09:15	27	126	23	0	13	55	0	0	1	11	6	87	174	73	0	596
09:30	22	100	24	2	14	60	1	0	1	3	10	64	190	62	0	553
09:45	31	89	21	0	19	62	0	0	1	8	3	55	193	49	1	532
Total	111	419	85	3	70	240	3	0	3	31	22	281	744	286	2	2300
*** BREAK ***																
16:30	130	6	18	1	20	155	2	0	1	51	39	2	99	16	1	541
16:45	135	8	23	1	18	153	0	0	4	47	39	12	103	17	1	561
Total	265	14	41	2	38	308	2	0	5	98	78	14	202	33	2	1102
17:00	222	9	31	1	14	252	0	2	4	62	58	8	79	22	2	766
17:15	156	8	30	0	20	175	2	0	3	44	54	8	118	17	0	635
17:30	150	2	21	1	21	182	1	0	4	57	49	9	104	43	0	644
17:45	99	2	10	1	7	160	0	2	5	69	53	15	101	38	1	563
Total	627	21	92	3	62	769	3	4	16	232	214	40	402	120	3	2608
18:00	112	2	15	1	6	190	0	0	3	73	52	5	113	25	0	597
18:15	81	2	7	0	11	147	0	1	2	63	52	4	110	14	0	494
Grand Total	1255	696	309	15	263	1902	15	5	34	506	436	541	2389	1047	11	9424
Apprch %	55.2	30.6	13.6	0.7	12	87	0.7	0.2	3.5	51.8	44.7	13.6	59.9	26.3	0.3	
Total %	13.3	7.4	3.3	0.2	2.8	20.2	0.2	0.1	0.4	5.4	4.6	5.7	25.4	11.1	0.1	

Transportation Studies, Inc.
2640 Walnut Avenue, Suite L
Tustin, CA. 92780

City: IRVINE
N-S Direction: CALIFORNIA AVENUE
E-W Direction: BISON AVENUE

File Name : H1701019
Site Code : 00000000
Start Date : 1/25/2017
Page No : 2

	CALIFORNIA AVENUE Southbound					BISON AVENUE Westbound					CALIFORNIA AVENUE Northbound				BISON AVENUE Eastbound					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 08:00 to 09:45 - Peak 1 of 1																				
Peak Hour for Entire Intersection Begins at 08:30																				
08:30	19	62	16	0	97	17	**66**				**1**		**7**							
08:45	16	73	**25**	**3**	117	21	63	**2**	0	86	1	4	2	7	59	**271**	**148**	**2**	**480**	**690**
09:00	**31**	104	17	1	153	**24**	63	2	0	**89**	0	9	3	12	75	187	102	1	365	619
09:15	27	**126**	23	0	**176**	13	55	0	0	68	1	**11**	6	**18**	**87**	174	73	0	334	596
Total Volume	93	365	81	4	543	75	247	4	0	326	3	25	18	46	271	847	461	4	1583	2498
% App. Total	17.1	67.2	14.9	0.7		23	75.8	1.2	0		6.5	54.3	39.1		17.1	53.5	29.1	0.3		
PHF	.750	.724	.810	.333	.771	.781	.936	.500	.000	.916	.750	.568	.643	.639	.779	.781	.779	.500	.824	.905

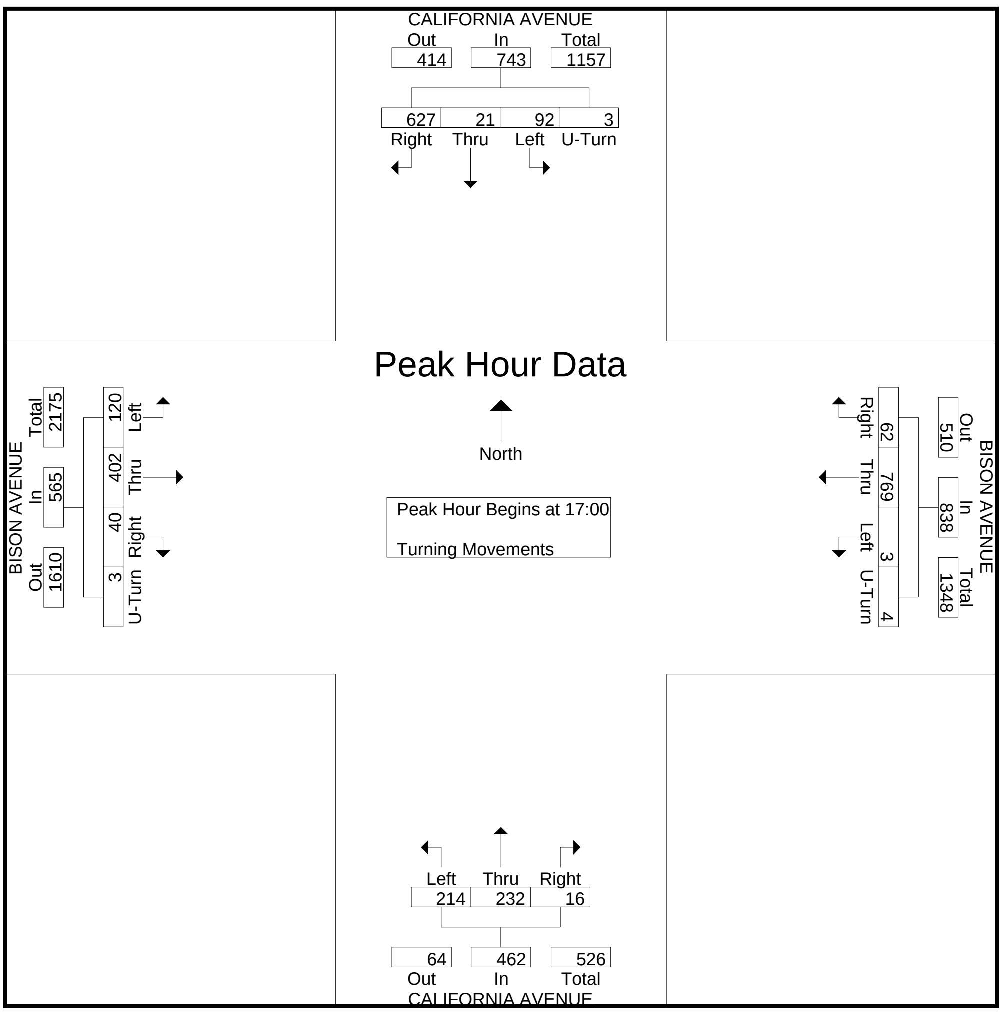


Transportation Studies, Inc.
2640 Walnut Avenue, Suite L
Tustin, CA. 92780

City: IRVINE
N-S Direction: CALIFORNIA AVENUE
E-W Direction: BISON AVENUE

File Name : H1701019
Site Code : 00000000
Start Date : 1/25/2017
Page No : 3

	CALIFORNIA AVENUE Southbound					BISON AVENUE Westbound					CALIFORNIA AVENUE Northbound				BISON AVENUE Eastbound					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 16:30 to 18:15 - Peak 1 of 1																				
Peak Hour for Entire Intersection Begins at 17:00																				
17:00	222	9	31	1	**263**	14	**252**	0	**2**	**268**	4	62	**58**	124	8	79	22	**2**	111	**766**
17:15	**156**	**8**	**30**	**0**	**194**	**20**	**175**	**2**	0	197	3	44	54	101	8	**118**	17	0	143	635
17:30	150	2	21	1	174	**21**	182	1	0	204	4	57	49	110	9	104	**43**	0	**156**	644
17:45	99	2	10	1	112	7	160	0	2	169	**5**	**69**	53	**127**	**15**	101	38	1	155	563
Total Volume	627	21	92	3	743	62	769	3	4	838	16	232	214	462	40	402	120	3	565	2608
% App. Total	84.4	2.8	12.4	0.4		7.4	91.8	0.4	0.5		3.5	50.2	46.3		7.1	71.2	21.2	0.5		
PHF	.706	.583	.742	.750	.706	.738	.763	.375	.500	.782	.800	.841	.922	.909	.667	.852	.698	.375	.905	.851



Transportation Studies, Inc.
2640 Walnut Avenue, Suite L
Tustin, CA. 92780

City: IRVINE
N-S Direction: SR-73 NB RAMPS
E-W Direction: BISON AVENUE

File Name : H1701018
Site Code : 00000000
Start Date : 1/25/2017
Page No : 1

Groups Printed- Turning Movements

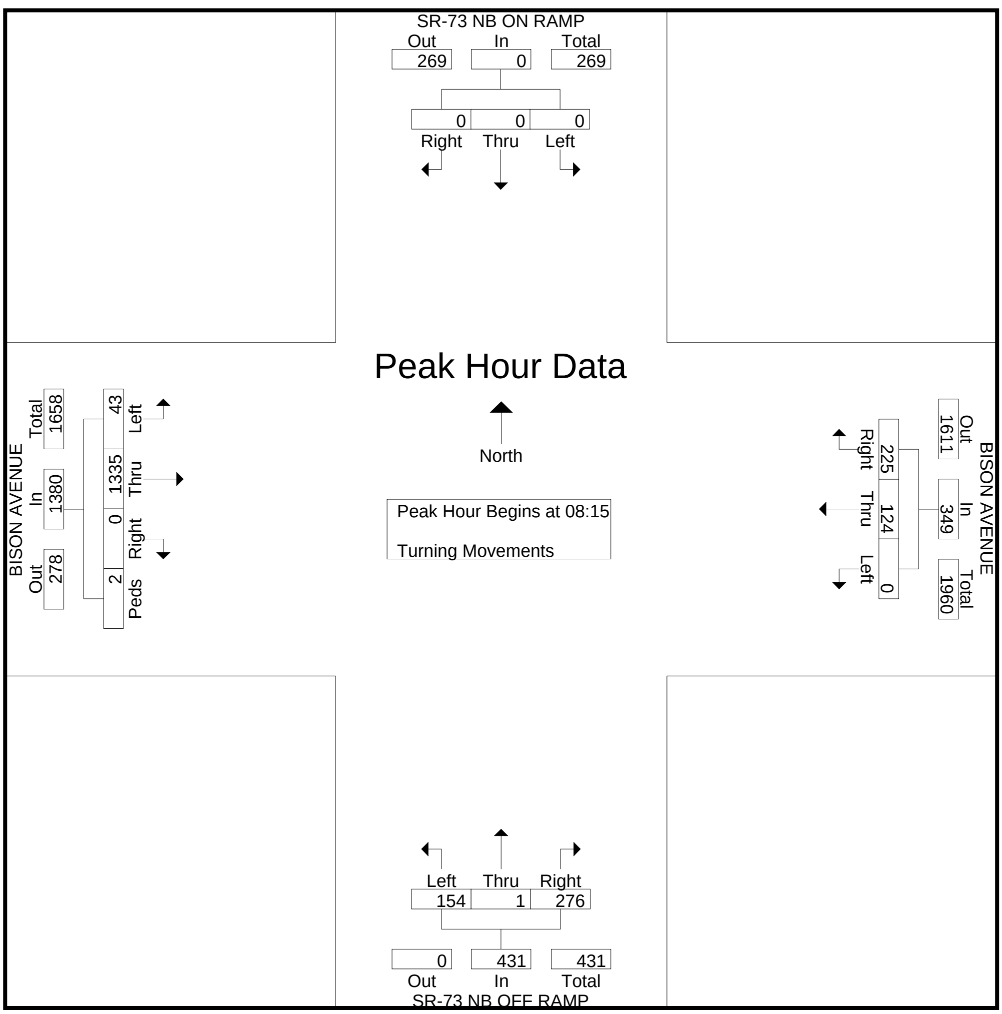
	SR-73 NB ON RAMP Southbound			BISON AVENUE Westbound			SR-73 NB OFF RAMP Northbound			BISON AVENUE Eastbound				
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Peds	Int. Total
08:00	0	0	0	51	25	0	77	1	32	0	277	16	0	479
08:15	0	0	0	52	22	0	66	0	35	0	280	11	0	466
08:30	0	0	0	66	28	0	79	1	45	0	333	13	1	566
08:45	0	0	0	50	37	0	80	0	48	0	392	11	1	619
Total	0	0	0	219	112	0	302	2	160	0	1282	51	2	2130
09:00	0	0	0	57	37	0	51	0	26	0	330	8	0	509
09:15	0	0	0	59	35	0	42	0	32	0	270	3	1	442
09:30	0	0	0	58	32	0	30	0	29	0	314	12	0	475
09:45	0	0	0	66	32	0	27	0	31	0	250	6	0	412
Total	0	0	0	240	136	0	150	0	118	0	1164	29	1	1838
*** BREAK ***														
16:30	0	0	0	216	107	0	6	0	28	0	112	5	0	474
16:45	0	0	0	209	122	0	2	0	21	0	131	11	2	498
Total	0	0	0	425	229	0	8	0	49	0	243	16	2	972
17:00	0	0	0	325	205	0	4	0	23	0	104	10	1	672
17:15	0	0	0	208	187	0	11	0	21	0	135	11	0	573
17:30	0	0	0	224	150	0	16	0	20	0	133	11	1	555
17:45	0	0	0	182	133	0	15	1	41	0	141	4	2	519
Total	0	0	0	939	675	0	46	1	105	0	513	36	4	2319
18:00	0	0	0	203	145	0	2	0	21	0	139	12	1	523
18:15	0	0	0	179	106	0	2	0	30	0	126	7	0	450
Grand Total	0	0	0	2205	1403	0	510	3	483	0	3467	151	10	8232
Apprch %	0	0	0	61.1	38.9	0	51.2	0.3	48.5	0	95.6	4.2	0.3	
Total %	0	0	0	26.8	17	0	6.2	0	5.9	0	42.1	1.8	0.1	

Transportation Studies, Inc.
2640 Walnut Avenue, Suite L
Tustin, CA. 92780

City: IRVINE
N-S Direction: SR-73 NB RAMPS
E-W Direction: BISON AVENUE

File Name : H1701018
Site Code : 00000000
Start Date : 1/25/2017
Page No : 2

	SR-73 NB ON RAMP Southbound				BISON AVENUE Westbound				SR-73 NB OFF RAMP Northbound				BISON AVENUE Eastbound					
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 08:00 to 09:45 - Peak 1 of 1																		
Peak Hour for Entire Intersection Begins at 08:15																		
08:15	**0**	**0**	**0**	**0**	**52**	**22**	**0**	**74**	**66**	**0**	**35**	**101**	**0**	**280**	**11**	**0**	**291**	**466**
08:30	0	0	0	0	66	28	0	94	79	1	45	125	0	333	13	**1**	347	566
08:45	0	0	0	0	50	**37**	0	87	**80**	0	**48**	**128**	0	**392**	11	1	**404**	**619**
09:00	**0**	**0**	**0**	**0**	**57**	**37**	**0**	**94**	**51**	**0**	**26**	**77**	**0**	**330**	**8**	**0**	**338**	**509**
Total Volume	0	0	0	0	225	124	0	349	276	1	154	431	0	1335	43	2	1380	2160
% App. Total	0	0	0		64.5	35.5	0		64	0.2	35.7		0	96.7	3.1	0.1		
PHF	.000	.000	.000	.000	.852	.838	.000	.928	.863	.250	.802	.842	.000	.851	.827	.500	.854	.872

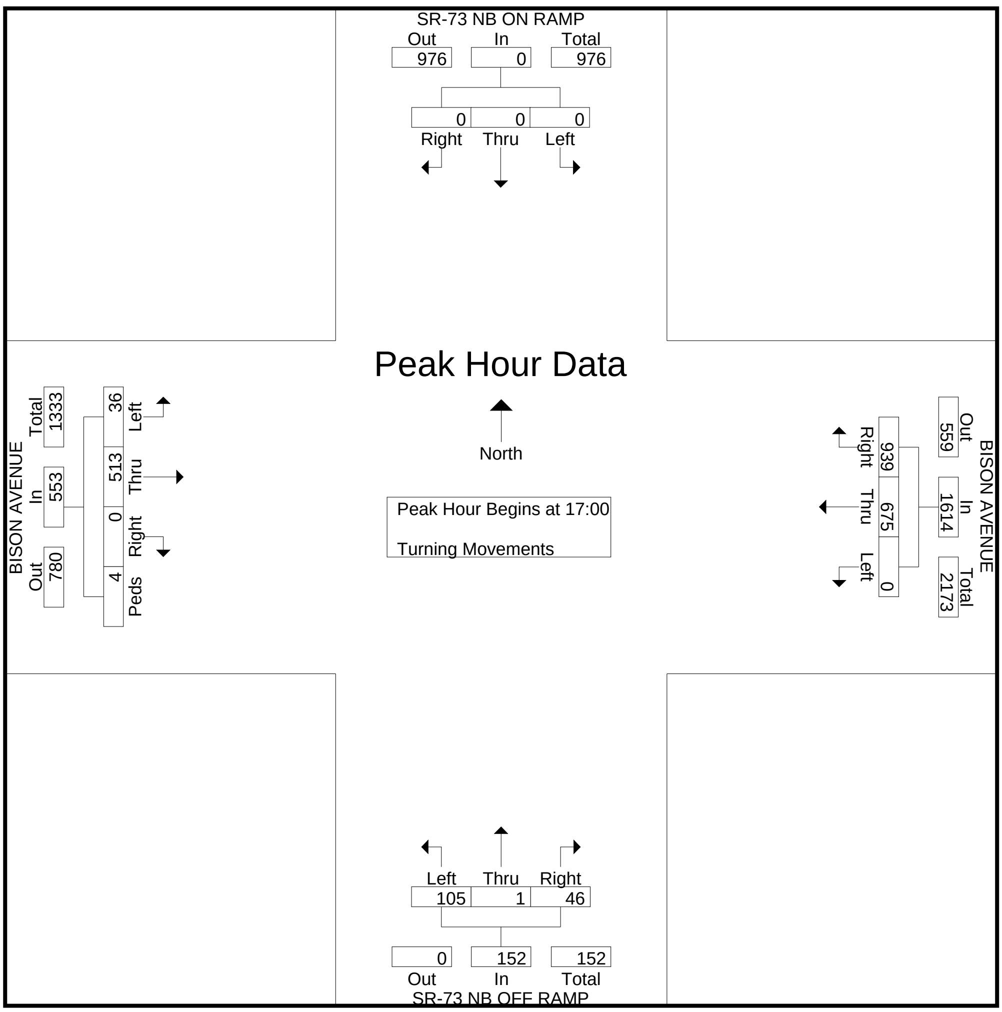


Transportation Studies, Inc.
2640 Walnut Avenue, Suite L
Tustin, CA. 92780

City: IRVINE
N-S Direction: SR-73 NB RAMPS
E-W Direction: BISON AVENUE

File Name : H1701018
Site Code : 00000000
Start Date : 1/25/2017
Page No : 3

	SR-73 NB ON RAMP Southbound				BISON AVENUE Westbound				SR-73 NB OFF RAMP Northbound				BISON AVENUE Eastbound					
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 16:30 to 18:15 - Peak 1 of 1																		
Peak Hour for Entire Intersection Begins at 17:00																		
17:00	0	0	0	0	325	205	0	530	4	0	23	27	0	104	10	1	115	672
17:15	0	0	0	0	208	187	0	395	11	0	21	32	0	135	**11**			
17:30	0	0	0	0	224	150	0	374	**16**	0	20	36	0	133	11	1	145	555
17:45	0	0	0	0	182	133	0	315	15	**1**	**41**	**57**	0	**141**	4	**2**	**147**	519
Total Volume	0	0	0	0	939	675	0	1614	46	1	105	152	0	513	36	4	553	2319
% App. Total	0	0	0		58.2	41.8	0		30.3	0.7	69.1		0	92.8	6.5	0.7		
PHF	.000	.000	.000	.000	.722	.823	.000	.761	.719	.250	.640	.667	.000	.910	.818	.500	.940	.863



Transportation Studies, Inc.
2640 Walnut Avenue, Suite L
Tustin, CA. 92780

City: IRVINE
N-S Direction: SR-73 SB RAMPS
E-W Direction: BISON AVENUE

File Name : H1706021
Site Code : 00000000
Start Date : 6/27/2017
Page No : 1

Groups Printed- Turning Movements

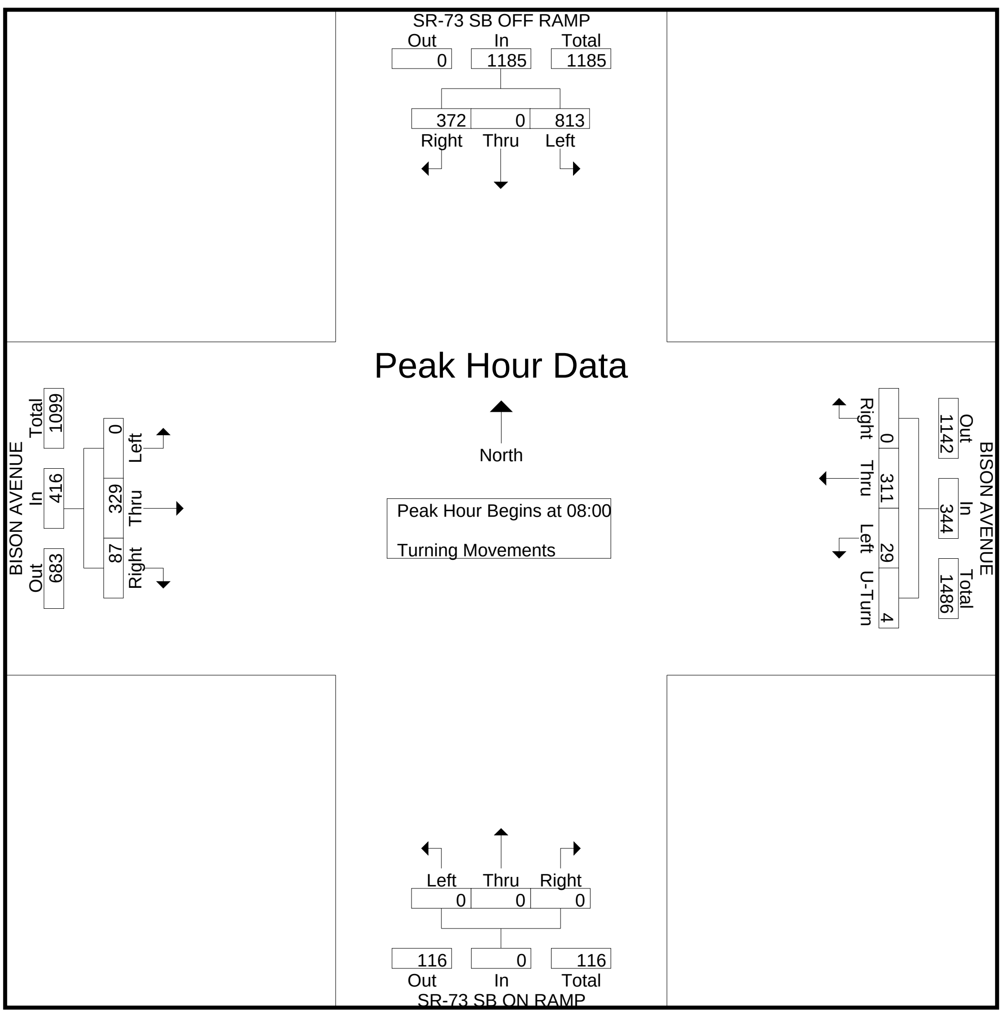
	SR-73 SB OFF RAMP Southbound			BISON AVENUE Westbound				SR-73 SB ON RAMP Northbound			BISON AVENUE Eastbound			
Start Time	Right	Thru	Left	Right	Thru	Left	U-Turn	Right	Thru	Left	Right	Thru	Left	Int. Total
08:00	68	0	220	0	69	4	2	0	0	0	16	76	0	455
08:15	98	0	190	0	76	5	1	0	0	0	28	98	0	496
08:30	101	0	196	0	76	4	0	0	0	0	15	78	0	470
08:45	105	0	207	0	90	16	1	0	0	0	28	77	0	524
Total	372	0	813	0	311	29	4	0	0	0	87	329	0	1945
09:00	43	0	189	0	70	10	1	0	0	0	20	68	0	401
09:15	55	0	165	0	71	10	1	0	0	0	18	70	0	390
09:30	54	0	135	0	68	5	2	0	0	0	16	56	0	336
09:45	68	0	140	0	56	7	0	0	0	0	13	44	0	328
Total	220	0	629	0	265	32	4	0	0	0	67	238	0	1455
*** BREAK ***														
16:30	29	0	74	0	86	30	1	0	0	0	30	51	0	301
16:45	37	0	60	0	110	50	2	0	0	0	36	53	0	348
Total	66	0	134	0	196	80	3	0	0	0	66	104	0	649
17:00	45	0	70	0	110	60	0	0	0	0	40	44	0	369
17:15	36	0	85	0	106	58	2	0	0	0	46	55	0	388
17:30	30	0	89	0	107	43	0	0	0	0	32	42	0	343
17:45	30	0	82	0	95	34	0	0	0	0	31	54	0	326
Total	141	0	326	0	418	195	2	0	0	0	149	195	0	1426
18:00	29	0	79	0	103	43	0	0	0	0	28	39	0	321
18:15	33	0	86	0	70	26	1	0	0	0	32	40	0	288
Grand Total	861	0	2067	0	1363	405	14	0	0	0	429	945	0	6084
Apprch %	29.4	0	70.6	0	76.5	22.7	0.8	0	0	0	31.2	68.8	0	
Total %	14.2	0	34	0	22.4	6.7	0.2	0	0	0	7.1	15.5	0	

Transportation Studies, Inc.
2640 Walnut Avenue, Suite L
Tustin, CA. 92780

City: IRVINE
N-S Direction: SR-73 SB RAMPS
E-W Direction: BISON AVENUE

File Name : H1706021
Site Code : 00000000
Start Date : 6/27/2017

	SR-73 SB OFF RAMP Southbound				BISON AVENUE Westbound					SR-73 SB ON RAMP Northbound				BISON AVENUE Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 08:00 to 09:45 - Peak 1 of 1																		
Peak Hour for Entire Intersection Begins at 08:00																		
08:00	68	0	**220**	288	0	69	4	**2**	75	0	0	0	0	16	76	0	92	455
08:15	98	0	190	288	0	76	5	1	82	0	0	0	0	**28**	**98**	0	**126**	496
08:30	101	0	196	297	0	76	4	0	80	0	0	0	0	15	78	0	93	470
08:45	**105**	0	207	**312**	0	**90**	**16**	1	**107**	0	0	0	0	28	77	0	105	**524**
Total Volume	372	0	813	1185	0	311	29	4	344	0	0	0	0	87	329	0	416	1945
% App. Total	31.4	0	68.6		0	90.4	8.4	1.2		0	0	0		20.9	79.1	0		
PHF	.886	.000	.924	.950	.000	.864	.453	.500	.804	.000	.000	.000	.000	.777	.839	.000	.825	.928

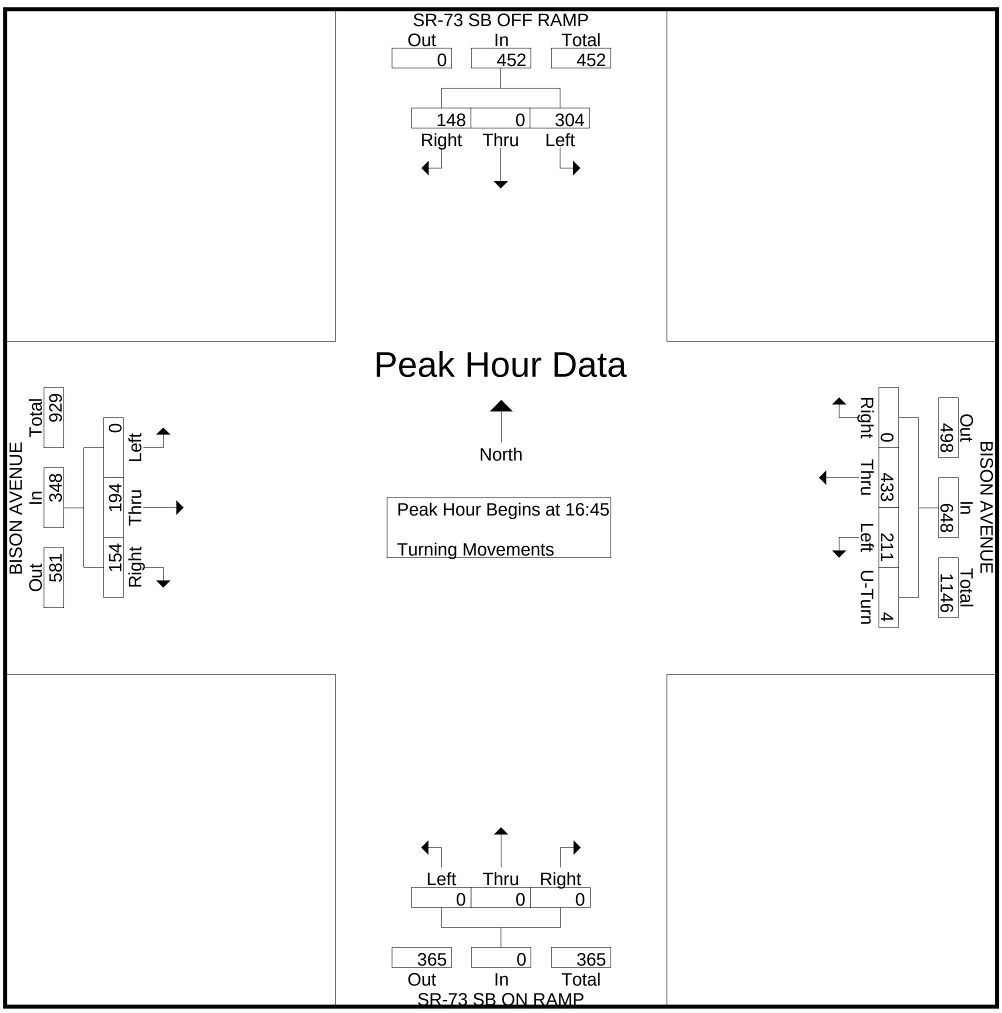


Transportation Studies, Inc.
2640 Walnut Avenue, Suite L
Tustin, CA. 92780

City: IRVINE
N-S Direction: SR-73 SB RAMPS
E-W Direction: BISON AVENUE

File Name : H1706021
Site Code : 00000000
Start Date : 6/27/2017
Page No : 3

	SR-73 SB OFF RAMP Southbound				BISON AVENUE Westbound					SR-73 SB ON RAMP Northbound				BISON AVENUE Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 16:30 to 18:15 - Peak 1 of 1																		
Peak Hour for Entire Intersection Begins at 16:45																		
16:45	37	0	60	97	0	**110**	50	**2**	162	0	0	0	0	36	53	0	89	348
17:00	**45**	0	70	115	0	110	**60**	0	**170**	0	0	0	0	40	44	0	84	369
17:15	36	0	85	**121**	0	106	58	2	166	0	0	0	0	**46**	**55**	0	**101**	**388**
17:30	30	0	**89**	119	0	107	43	0	150	0	0	0	0	32	42	0	74	343
Total Volume	148	0	304	452	0	433	211	4	648	0	0	0	0	154	194	0	348	1448
% App. Total	32.7	0	67.3		0	66.8	32.6	0.6		0	0	0		44.3	55.7	0		
PHF	.822	.000	.854	.934	.000	.984	.879	.500	.953	.000	.000	.000	.000	.837	.882	.000	.861	.933



Transportation Studies, Inc.
2640 Walnut Avenue, Suite L
Tustin, CA. 92780

City: IRVINE
N-S Direction: LOS TRANCOS
E-W Direction: PELTASON DRIVE

File Name : H1610018
Site Code : 00000000
Start Date : 10/4/2016
Page No : 1

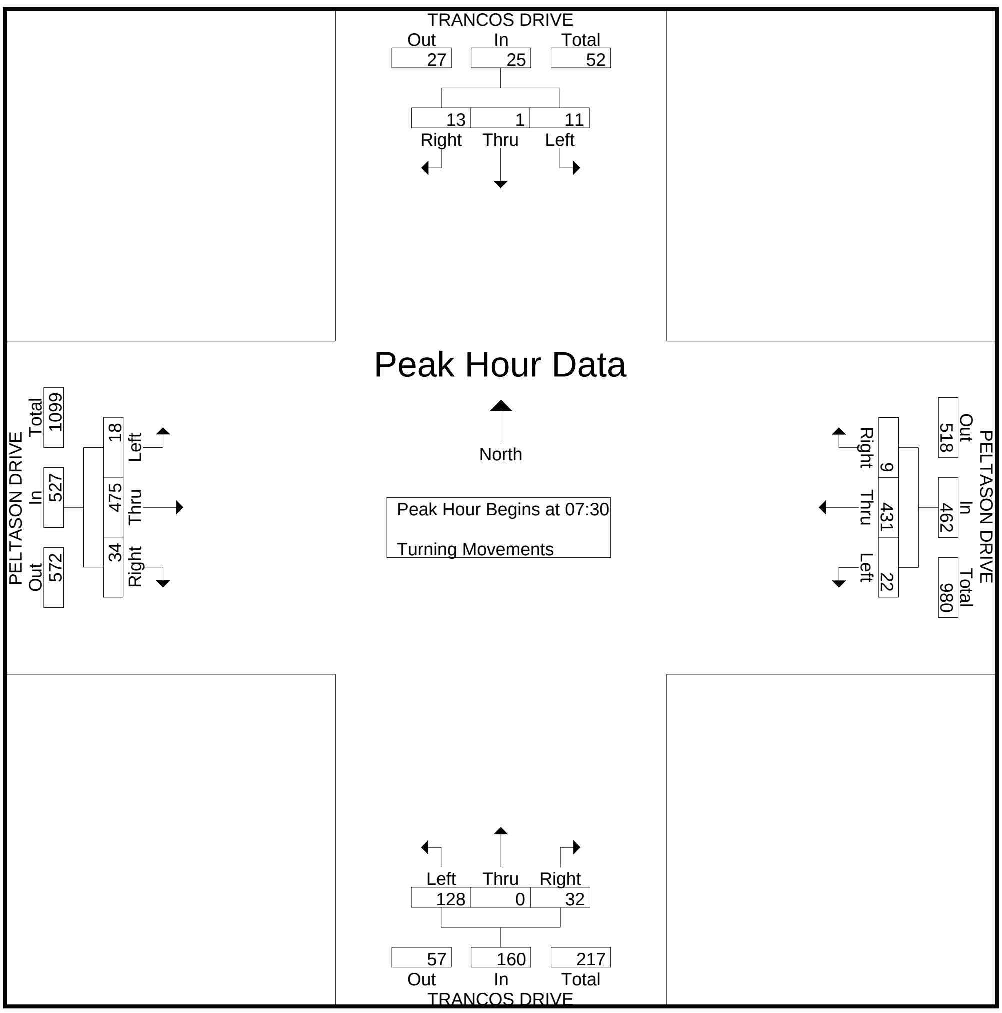
Groups Printed- Turning Movements

	TRANCOS DRIVE Southbound			PELTASON DRIVE Westbound			TRANCOS DRIVE Northbound			PELTASON DRIVE Eastbound			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00	2	0	0	3	49	3	1	0	21	2	47	2	130
07:15	1	0	1	1	68	3	11	0	31	11	88	1	216
07:30	1	1	3	3	88	2	12	0	27	2	140	4	283
07:45	6	0	4	2	142	5	6	0	36	12	138	9	360
Total	10	1	8	9	347	13	30	0	115	27	413	16	989
08:00	2	0	1	1	106	10	9	0	36	8	111	4	288
08:15	4	0	3	3	95	5	5	0	29	12	86	1	243
08:30	0	0	3	3	109	4	8	0	39	8	102	5	281
08:45	1	1	2	4	149	6	7	0	42	8	106	2	328
Total	7	1	9	11	459	25	29	0	146	36	405	12	1140
16:00	1	0	3	3	81	7	4	0	20	12	84	3	218
16:15	1	1	5	7	75	5	3	0	18	14	86	1	216
16:30	3	0	3	0	93	4	2	1	15	17	130	6	274
16:45	2	1	3	12	125	4	5	0	10	20	164	10	356
Total	7	2	14	22	374	20	14	1	63	63	464	20	1064
17:00	5	2	9	11	177	10	5	1	9	22	179	6	436
17:15	1	2	0	3	131	7	9	1	11	24	168	5	362
17:30	0	0	3	1	101	14	2	0	14	19	157	1	312
17:45	1	0	1	1	70	16	9	0	14	19	190	2	323
Total	7	4	13	16	479	47	25	2	48	84	694	14	1433
Grand Total	31	8	44	58	1659	105	98	3	372	210	1976	62	4626
Apprch %	37.3	9.6	53	3.2	91.1	5.8	20.7	0.6	78.6	9.3	87.9	2.8	
Total %	0.7	0.2	1	1.3	35.9	2.3	2.1	0.1	8	4.5	42.7	1.3	

Transportation Studies, Inc.
2640 Walnut Avenue, Suite L
Tustin, CA. 92780

File Name : H1610018
Site Code : 00000000
Start Date : 10/4/2016
Page No : 2

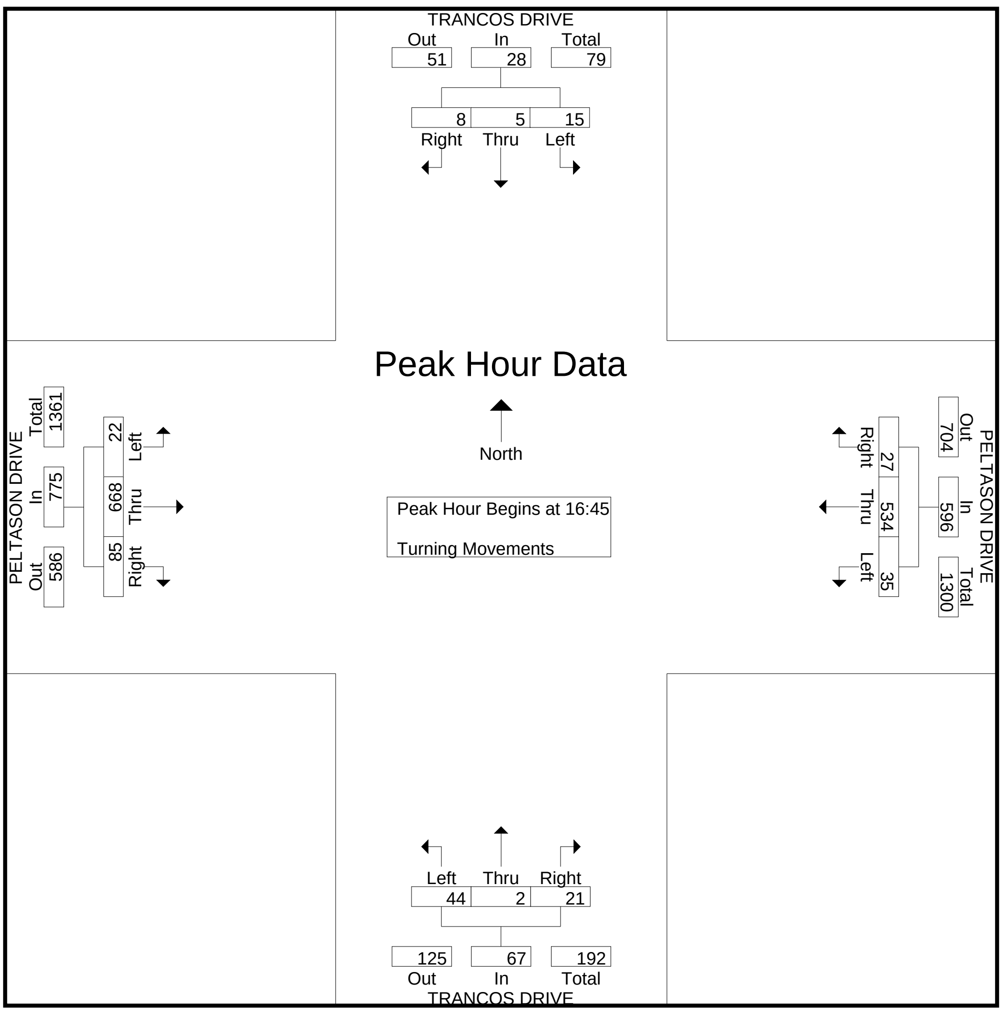
	TRANCOS DRIVE Southbound				PELTASON DRIVE Westbound				TRANCOS DRIVE Northbound				PELTASON DRIVE Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30																	
07:30	1	**1**	3	5	**3**	88	2	93	**12**	0	27	39	2	**140**	4	146	283
07:45	**6**	0	**4**	**10**	2	**142**	5	**149**	6	0	**36**	42	**12**	138	**9**	**159**	**360**
08:00	2	0	1	3	1	106	**10**	117	9	0	36	**45**	8	111	4	123	288
08:15	4	0	3	7	3	95	5	103	5	0	29	34	12	86	1	99	243
Total Volume	13	1	11	25	9	431	22	462	32	0	128	160	34	475	18	527	1174
% App. Total	52	4	44		1.9	93.3	4.8		20	0	80		6.5	90.1	3.4		
PHF	.542	.250	.688	.625	.750	.759	.550	.775	.667	.000	.889	.889	.708	.848	.500	.829	.815



Transportation Studies, Inc.
2640 Walnut Avenue, Suite L
Tustin, CA. 92780

File Name : H1610018
Site Code : 00000000
Start Date : 10/4/2016

	TRANCOS DRIVE Southbound				PELTASON DRIVE Westbound				TRANCOS DRIVE Northbound				PELTASON DRIVE Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 16:45																	
16:45	2	1	3	6	**12**	125	4	141	5	0	10	15	20	164	**10**	194	356
17:00	**5**	**2**	**9**	**16**	11	**177**	10	**198**	5	**1**	9	15	22	**179**	6	**207**	**436**
17:15	1	2	0	3	3	131	7	141	**9**	1	11	**21**	**24**	168	5	197	362
17:30	0	0	3	3	1	101	**14**	116	2	0	**14**	16	19	157	1	177	312
Total Volume	8	5	15	28	27	534	35	596	21	2	44	67	85	668	22	775	1466
% App. Total	28.6	17.9	53.6		4.5	89.6	5.9		31.3	3	65.7		11	86.2	2.8		
PHF	.400	.625	.417	.438	.563	.754	.625	.753	.583	.500	.786	.798	.885	.933	.550	.936	.841



Transportation Studies, Inc.
2640 Walnut Avenue, Suite L
Tustin, CA. 92780

City: IRVINE
N-S Direction: PELTASON DRIVE
E-W Direction: ANTEATER DRIVE

File Name : H1610017
Site Code : 00005701
Start Date : 10/6/2016
Page No : 1

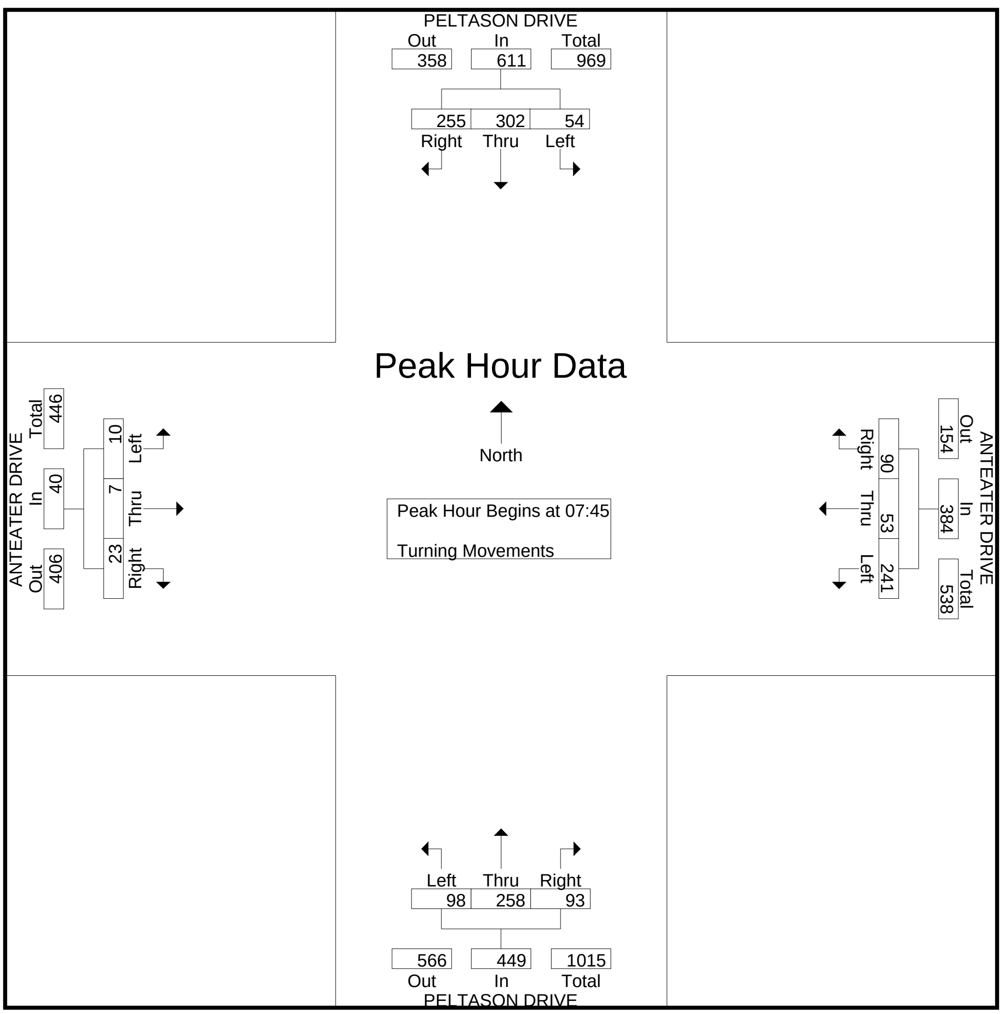
Groups Printed- Turning Movements

	PELTASON DRIVE Southbound			**ANTEATER DRIVE Westbound**			**PELTASON DRIVE Northbound**			**ANTEATER DRIVE Eastbound**			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00	8	31	5	7	3	16	11	34	9	0	0	0	124
07:15	19	31	0	10	1	29	15	25	16	3	0	1	150
07:30	65	36	10	11	5	39	13	38	21	5	0	0	243
07:45	98	81	9	19	20	56	17	63	37	5	1	1	407
Total	190	179	24	47	29	140	56	160	83	13	1	2	924
08:00	91	104	12	24	18	85	31	65	28	5	1	2	466
08:15	38	67	12	20	7	42	24	74	19	5	2	6	316
08:30	28	50	21	27	8	58	21	56	14	8	3	1	295
08:45	53	74	21	26	10	59	19	66	19	6	3	3	359
Total	210	295	66	97	43	244	95	261	80	24	9	12	1436
16:00	15	68	31	21	1	39	39	50	6	19	8	30	327
16:15	21	58	41	23	3	27	43	53	3	11	12	24	319
16:30	17	47	26	26	2	28	40	62	8	10	5	36	307
16:45	44	73	41	22	4	34	36	74	10	16	1	36	391
Total	97	246	139	92	10	128	158	239	27	56	26	126	1344
17:00	28	71	42	24	2	50	57	93	6	23	16	68	480
17:15	10	86	42	23	2	39	84	119	4	38	14	74	535
17:30	10	58	56	24	1	36	83	105	1	25	12	65	476
17:45	13	46	55	30	2	31	67	91	2	9	8	43	397
Total	61	261	195	101	7	156	291	408	13	95	50	250	1888
Grand Total	558	981	424	337	89	668	600	1068	203	188	86	390	5592
Apprch %	28.4	50	21.6	30.8	8.1	61.1	32.1	57.1	10.8	28.3	13	58.7	
Total %	10	17.5	7.6	6	1.6	11.9	10.7	19.1	3.6	3.4	1.5	7	

Transportation Studies, Inc.
2640 Walnut Avenue, Suite L
Tustin, CA. 92780

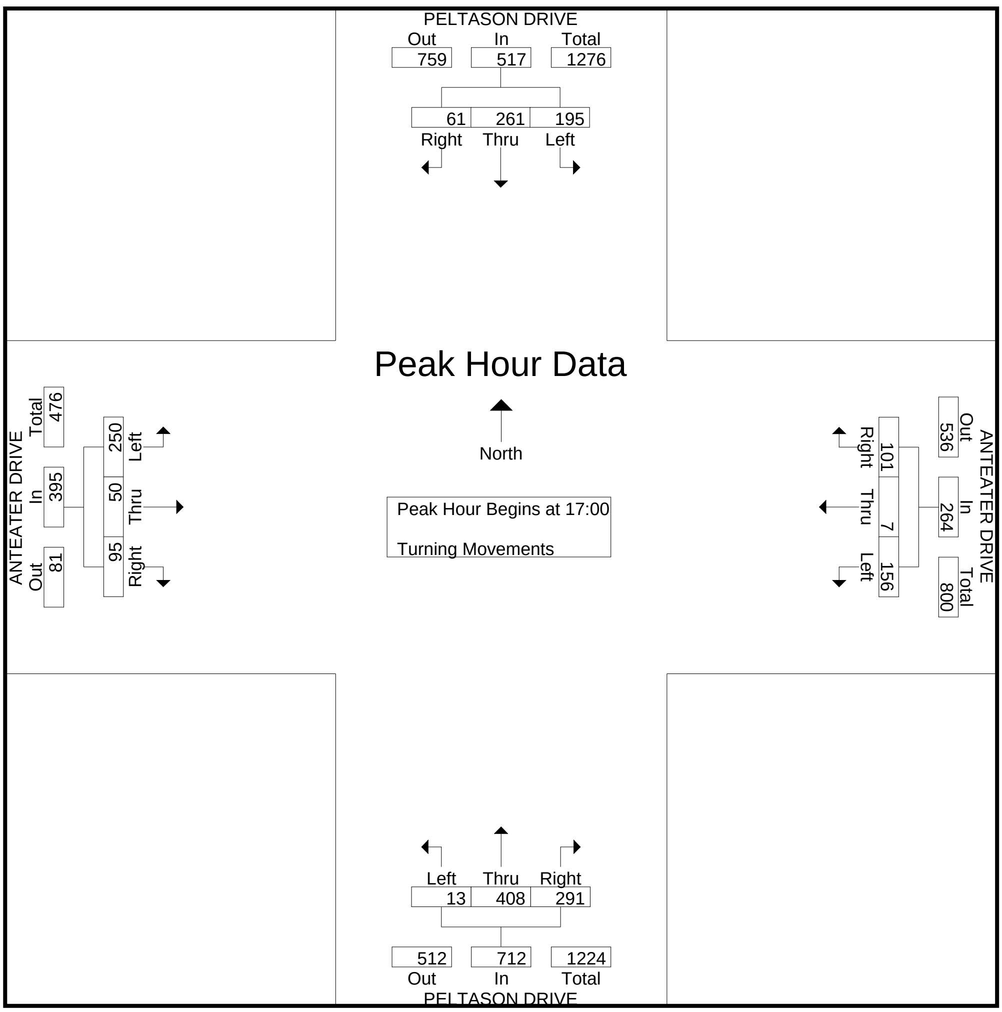
File Name : H1610017
Site Code : 00005701
Start Date : 10/6/2016

	PELTASON DRIVE Southbound				ANTEATER DRIVE Westbound				PELTASON DRIVE Northbound				ANTEATER DRIVE Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45																	
07:45	**98**	81	9	188	19	**20**	56	95	17	63	**37**	**117**	**5**	**1**	**1**	**7**	**407**
08:00	**91**	**104**	**12**	**207**			**85**	**127**	**31**			**124**					**466**
08:15	38	67	12	117	20	7	42	69	24	**74**	**19**	**117**	**5**	**2**	**6**	**13**	316
08:30	28	50	**21**	**99**	**27**	8	58	93	21	56	14	91	**8**	**3**	1	12	295
Total Volume	255	302	54	611	90	53	241	384	93	258	98	449	23	7	10	40	1484
% App. Total	41.7	49.4	8.8		23.4	13.8	62.8		20.7	57.5	21.8		57.5	17.5	25		
PHF	.651	.726	.643	.738	.833	.663	.709	.756	.750	.872	.662	.905	.719	.583	.417	.769	.796



File Name : H1610017
Site Code : 00005701
Start Date : 10/6/2016
Page No : 3

	PELTASON DRIVE Southbound				ANTEATER DRIVE Westbound				PELTASON DRIVE Northbound				ANTEATER DRIVE Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 17:00																	
17:00	**28**	71	42	**141**	24	**2**	**50**	**76**	57	93	**6**	156	**23**	**16**	68	107	480
17:15	10	**86**	42	138	**23**	**2**	39	64	**84**	**119**	4	**207**	**38**	14	**74**	**126**	**535**
17:30	10	58	**56**	124	**24**	1	36	61	83	105	1	189	25	12	65	102	476
17:45	**13**	**46**	**55**	**114**	**30**												
Total Volume	61	261	195	517	101	7	156	264	291	408	13	712	95	50	250	395	1888
% App. Total	11.8	50.5	37.7		38.3	2.7	59.1		40.9	57.3	1.8		24.1	12.7	63.3		
PHF	.545	.759	.871	.917	.842	.875	.780	.868	.866	.857	.542	.860	.625	.781	.845	.784	.882



Transportation Studies, Inc.
2640 Walnut Avenue, Suite L
Tustin, CA. 92780

City: IRVINE
N-S Direction: PELTASON DRIVE
E-W Direction: PEREIRA DRIVE

File Name : H1610016
Site Code : 00005701
Start Date : 10/5/2016
Page No : 1

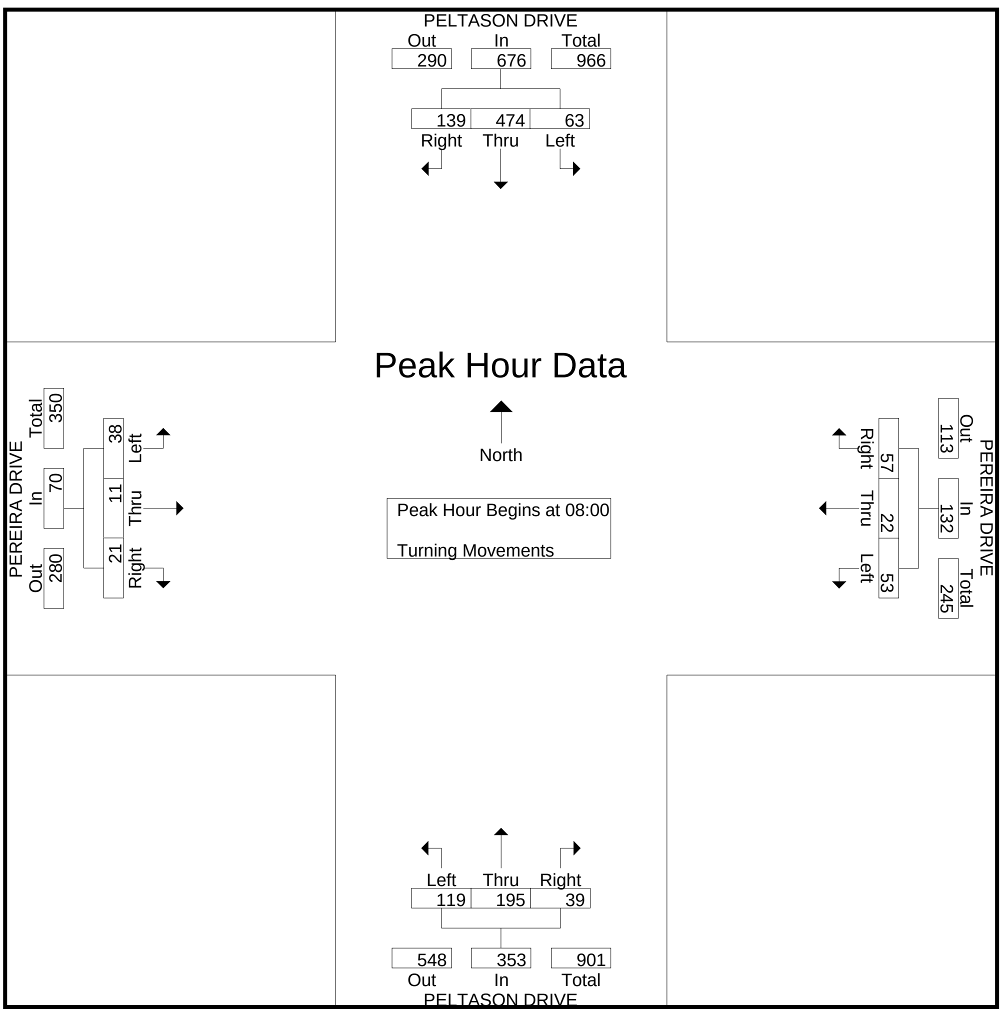
Groups Printed- Turning Movements

	PELTASON DRIVE Southbound			PEREIRA DRIVE Westbound			PELTASON DRIVE Northbound			PEREIRA DRIVE Eastbound			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00	2	62	11	6	1	4	15	17	7	1	0	0	126
07:15	9	71	6	3	2	5	9	21	7	2	1	0	136
07:30	22	106	13	6	4	9	11	32	14	5	3	5	230
07:45	22	122	17	20	11	19	9	54	20	1	2	3	300
Total	55	361	47	35	18	37	44	124	48	9	6	8	792
08:00	50	140	31	21	5	13	13	42	36	6	5	18	380
08:15	29	82	10	12	7	9	4	50	28	4	0	6	241
08:30	32	89	8	10	6	13	5	31	27	4	3	6	234
08:45	28	163	14	14	4	18	17	72	28	7	3	8	376
Total	139	474	63	57	22	53	39	195	119	21	11	38	1231
16:00	18	70	6	12	5	17	18	80	12	22	6	28	294
16:15	19	57	16	24	6	15	19	108	14	16	12	38	344
16:30	10	66	10	17	8	12	9	85	7	23	4	28	279
16:45	11	104	20	20	6	15	13	96	2	18	6	24	335
Total	58	297	52	73	25	59	59	369	35	79	28	118	1252
17:00	12	76	17	21	5	14	20	154	13	24	11	36	403
17:15	8	104	21	17	3	13	15	208	5	39	6	38	477
17:30	9	74	8	23	3	9	21	146	15	28	6	28	370
17:45	13	83	18	21	3	17	24	118	12	26	6	27	368
Total	42	337	64	82	14	53	80	626	45	117	29	129	1618
Grand Total	294	1469	226	247	79	202	222	1314	247	226	74	293	4893
Apprch %	14.8	73.9	11.4	46.8	15	38.3	12.5	73.7	13.9	38.1	12.5	49.4	
Total %	6	30	4.6	5	1.6	4.1	4.5	26.9	5	4.6	1.5	6	

Transportation Studies, Inc.
2640 Walnut Avenue, Suite L
Tustin, CA. 92780

File Name : H1610016
Site Code : 00005701
Start Date : 10/5/2016
Page No : 2

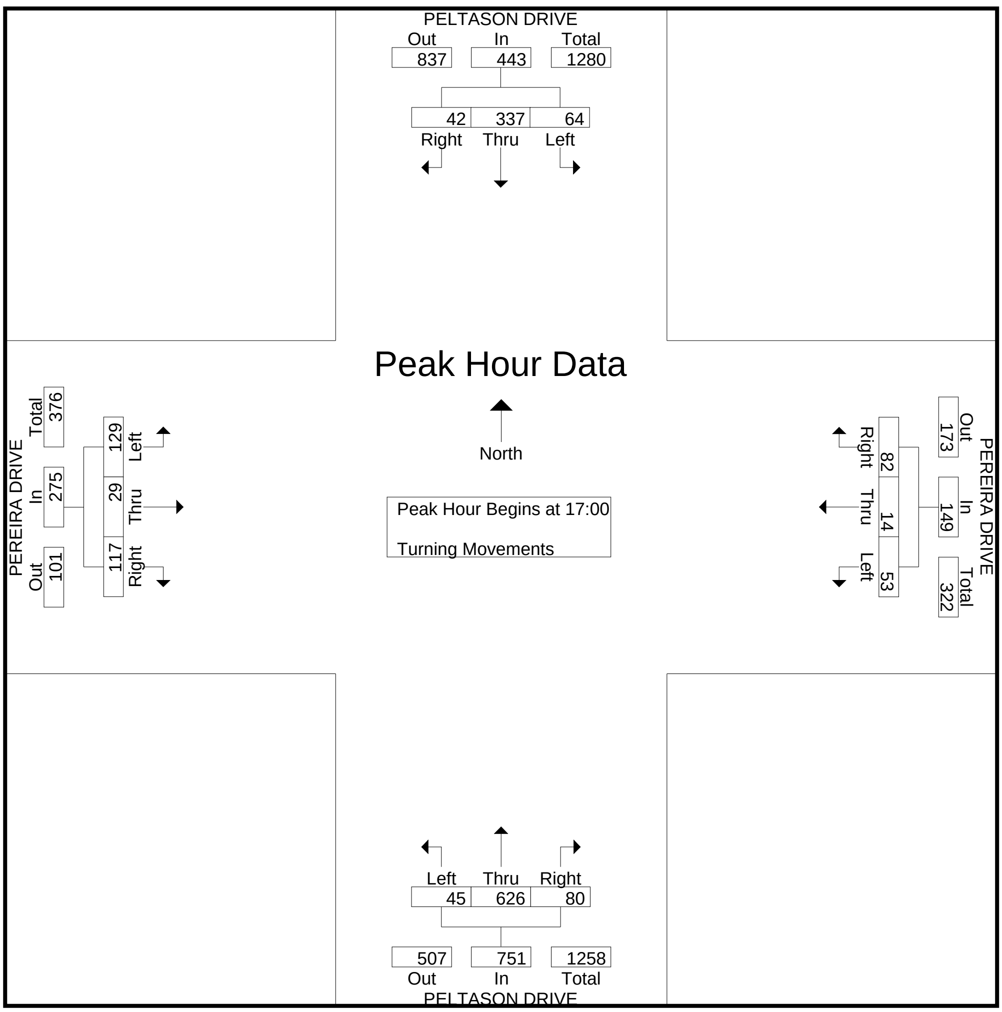
	PELTASON DRIVE Southbound				**PEREIRA DRIVE Westbound**				**PELTASON DRIVE Northbound**				**PEREIRA DRIVE Eastbound**				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00																	
08:00	**50**	140	**31**	**221**	**21**	5	13	**39**	13	42	**36**	**91**	**6**	**5**	**18**	**29**	**380**
08:15	29	82	10	121	12	**7**	9	28	4	50	28	82	4	0	6	10	241
08:30	32	89	8	129	10	6	13	29	5	31	27	63	4	3	6	13	234
08:45	28	**163**	**14**	**205**	**14**	**4**	**18**	36	**17**	**72**	**28**	**117**	**7**	3	8	18	376
Total Volume	139	474	63	676	57	22	53	132	39	195	119	353	21	11	38	70	1231
% App. Total	20.6	70.1	9.3		43.2	16.7	40.2		11	55.2	33.7		30	15.7	54.3		
PHF	.695	.727	.508	.765	.679	.786	.736	.846	.574	.677	.826	.754	.750	.550	.528	.603	.810



Transportation Studies, Inc.
2640 Walnut Avenue, Suite L
Tustin, CA. 92780

File Name : H1610016
Site Code : 00005701
Start Date : 10/5/2016
Page No : 3

	PELTASON DRIVE Southbound				PEREIRA DRIVE Westbound				PELTASON DRIVE Northbound				PEREIRA DRIVE Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 17:00																	
17:00	12	76	17	105	21	**5**	14	40	20	154	13	187	24	**11**	36	71	403
17:15	8	**104**	**21**	**133**	17	3	13	33	15	**208**	**5**	**228**	**39**	6	**38**	**83**	**477**
17:30	9	74	8	91	**23**	3	9	35	21	146	**15**	**182**	**28**	**6**	**28**	**62**	**370**
17:45	**13**						**17**	**41**	**24**								
Total Volume	42	337	64	443	82	14	53	149	80	626	45	751	117	29	129	275	1618
% App. Total	9.5	76.1	14.4		55	9.4	35.6		10.7	83.4	6		42.5	10.5	46.9		
PHF	.808	.810	.762	.833	.891	.700	.779	.909	.833	.752	.750	.823	.750	.659	.849	.828	.848



Transportation Studies, Inc.
2640 Walnut Avenue, Suite L
Tustin, CA. 92780

City: IRVINE
N-S Direction: PELTASON DR /BERKELEY AV
E-W Direction: CAMPUS DRIVE

File Name : h1610015
Site Code : 00005701
Start Date : 10/4/2016
Page No : 1

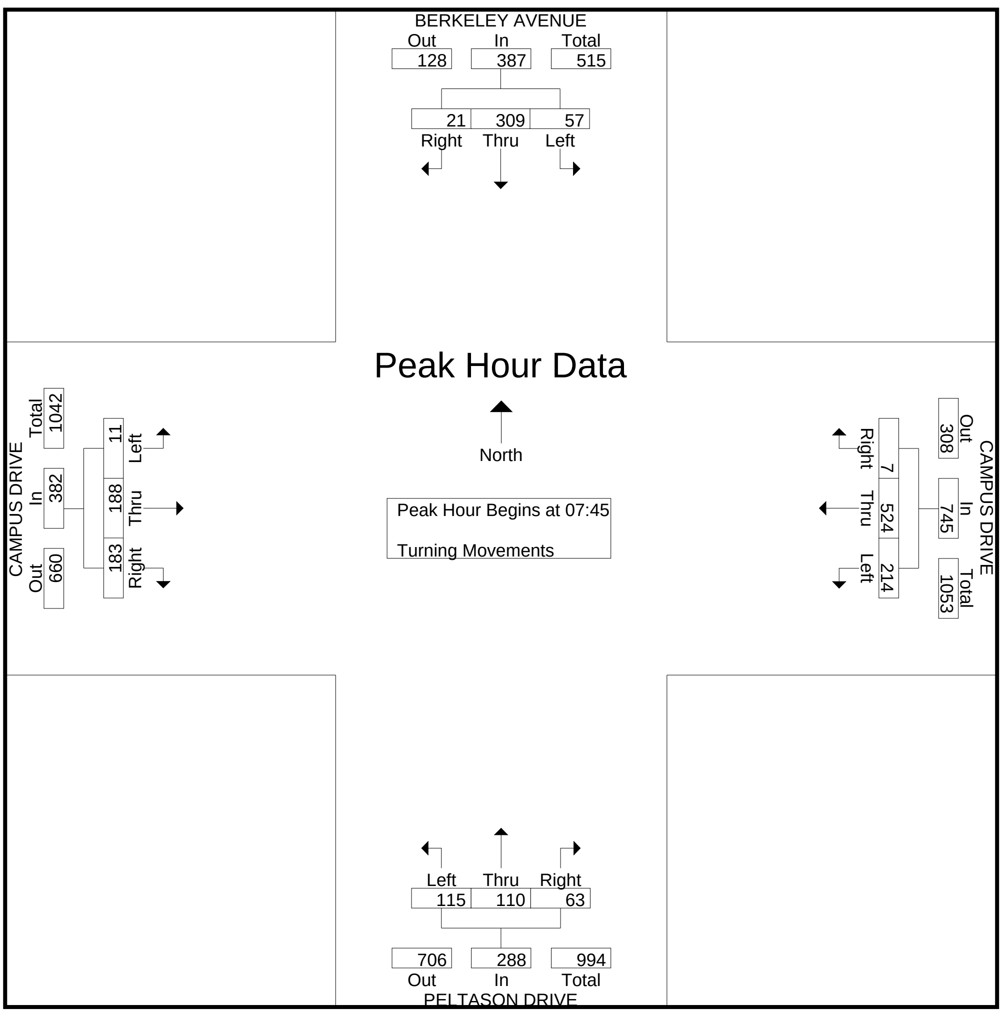
Groups Printed- Turning Movements

	BERKELEY AVENUE Southbound			CAMPUS DRIVE Westbound			PELTASON DRIVE Northbound			CAMPUS DRIVE Eastbound			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00	1	19	0	2	45	23	4	9	7	14	31	2	157
07:15	9	41	0	1	49	16	7	8	7	25	31	3	197
07:30	2	72	2	1	62	23	11	12	17	45	33	0	280
07:45	5	92	1	0	140	69	24	23	27	62	47	2	492
Total	17	224	3	4	296	131	46	52	58	146	142	7	1126
08:00	9	128	6	2	156	60	14	32	32	59	57	3	558
08:15	3	45	16	2	122	54	13	25	28	28	34	4	374
08:30	4	44	34	3	106	31	12	30	28	34	50	2	378
08:45	4	48	30	4	98	48	11	26	19	61	51	1	401
Total	20	265	86	11	482	193	50	113	107	182	192	10	1711
16:00	8	36	3	4	104	21	37	53	38	31	96	5	436
16:15	2	26	0	2	109	29	36	43	33	34	119	6	439
16:30	6	29	4	5	109	28	30	50	36	46	118	7	468
16:45	5	60	5	1	114	29	48	73	41	61	112	4	553
Total	21	151	12	12	436	107	151	219	148	172	445	22	1896
17:00	9	36	6	2	112	27	74	109	57	28	192	10	662
17:15	8	25	12	4	111	30	61	131	79	41	178	6	686
17:30	10	33	4	3	120	21	47	81	54	36	146	4	559
17:45	7	45	8	5	111	29	52	60	43	52	158	5	575
Total	34	139	30	14	454	107	234	381	233	157	674	25	2482
Grand Total	92	779	131	41	1668	538	481	765	546	657	1453	64	7215
Apprch %	9.2	77.7	13.1	1.8	74.2	23.9	26.8	42.7	30.5	30.2	66.8	2.9	
Total %	1.3	10.8	1.8	0.6	23.1	7.5	6.7	10.6	7.6	9.1	20.1	0.9	

Transportation Studies, Inc.
2640 Walnut Avenue, Suite L
Tustin, CA. 92780

File Name : h1610015
Site Code : 00005701
Start Date : 10/4/2016

	BERKELEY AVENUE Southbound				CAMPUS DRIVE Westbound				PELTASON DRIVE Northbound				CAMPUS DRIVE Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45																	
07:45	5	92	1	98	0	140	**69**	209	**24**	23	27	74	**62**	47	2	111	492
08:00	**9**	**128**	**6**	**143**	2	**156**	60	**218**	14	**32**	**32**	**78**	59	**57**	3	**119**	**558**
08:15	3	45	16	64	2	122	54	178	13	25	28	66	28	34	**4**	66	374
08:30	4	44	**34**	**82**	**3**	106	31	140	12	30	28	70	34	50	2	86	378
Total Volume	21	309	57	387	7	524	214	745	63	110	115	288	183	188	11	382	1802
% App. Total	5.4	79.8	14.7		0.9	70.3	28.7		21.9	38.2	39.9		47.9	49.2	2.9		
PHF	.583	.604	.419	.677	.583	.840	.775	.854	.656	.859	.898	.923	.738	.825	.688	.803	.807



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File Name : h1610015
Site Code : 00005701
Start Date : 10/4/2016
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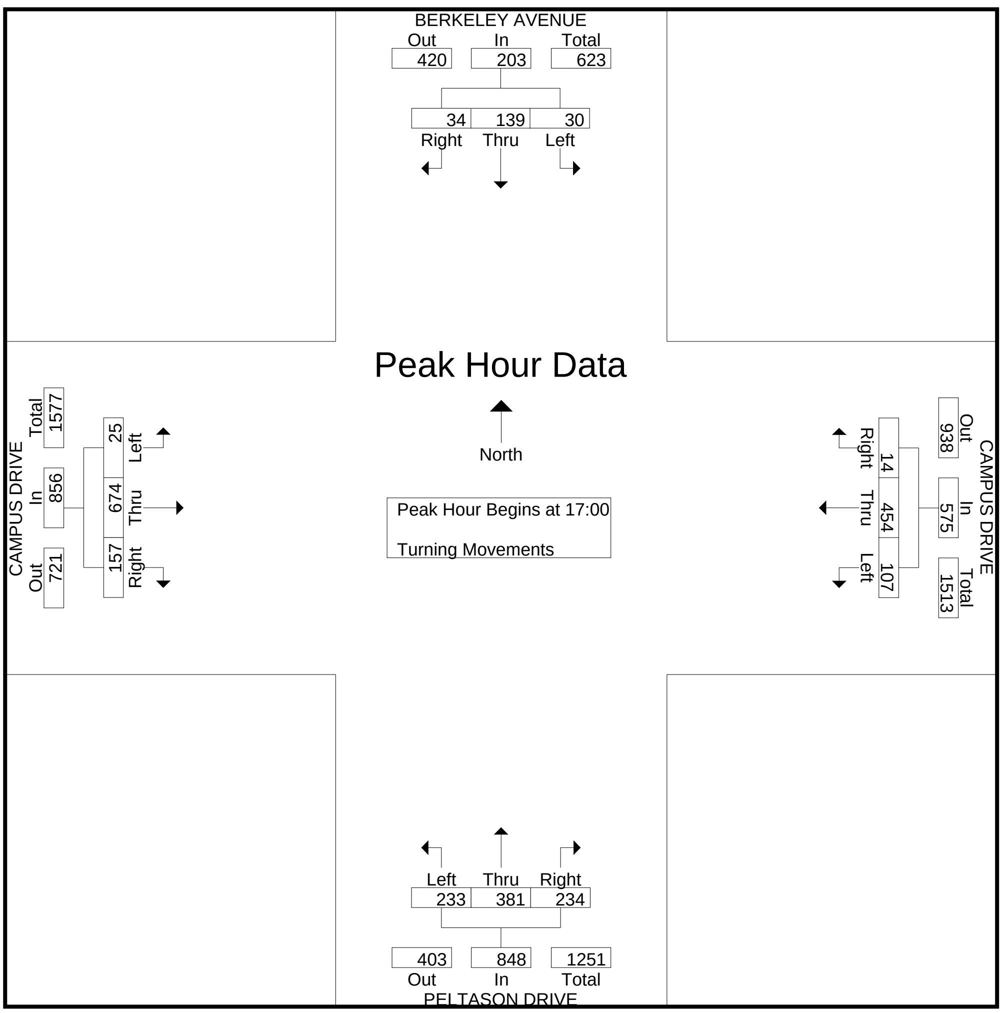
	BERKELEY AVENUE Southbound				CAMPUS DRIVE Westbound				PELTASON DRIVE Northbound				CAMPUS DRIVE Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 17:00																	
17:00	9	36	6	51	2	112	27	141	**74**	109	57	240	28	**192**	**10**	**230**	662
17:15	8	25	**12**	**45**	**4**	**111**	**30**	**145**	61	**131**	**79**	**271**	41	178	6	225	**686**
17:30	**10**	33	4	47	3	**120**	21	144	47	81	54	182	36	146	4	186	559
17:45	7	**45**	**8**	**60**	**5**	111	29	145	52	60	43	155	**52**	158	5	215	575
Total Volume	34	139	30	203	14	454	107	575	234	381	233	848	157	674	25	856	2482
% App. Total	16.7	68.5	14.8		2.4	79	18.6		27.6	44.9	27.5		18.3	78.7	2.9		
PHF	.850	.772	.625	.846	.700	.946	.892	.991	.791	.727	.737	.782	.755	.878	.625	.930	.905



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City: IRVINE
N-S Direction: BONITA CYN/CULVER DR
E-W Direction: SHADY CYN / ANTEATER DR

File Name : H1610019
Site Code : 00000000
Start Date : 10/4/2016
Page No : 1

Groups Printed- Turning Movements

	CULVER DRIVE Southbound			SHADY CANYON DRIVE Westbound			BONITA CANYON DRIVE Northbound				ANTEATER DRIVE Eastbound			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	U-Turns	Right	Thru	Left	Int. Total
07:00	3	91	13	6	7	29	23	85	5	1	14	2	3	282
07:15	8	118	2	8	5	43	32	115	16	0	16	5	11	379
07:30	15	143	6	18	9	72	36	123	22	1	13	28	36	522
07:45	30	139	17	36	32	84	41	148	37	1	31	8	16	620
Total	56	491	38	68	53	228	132	471	80	3	74	43	66	1803
08:00	15	156	11	6	15	64	49	107	21	4	24	15	12	499
08:15	17	149	7	10	24	67	32	147	26	2	27	9	11	528
08:30	17	152	6	14	20	56	38	143	34	3	24	7	7	521
08:45	23	158	5	6	19	57	43	146	28	0	27	9	10	531
Total	72	615	29	36	78	244	162	543	109	9	102	40	40	2079
16:00	8	142	15	7	6	51	46	166	21	1	22	15	8	508
16:15	18	137	5	8	7	45	55	200	19	2	36	10	10	552
16:30	13	138	11	6	8	54	69	167	15	1	36	23	13	554
16:45	25	154	15	10	5	37	75	234	32	3	55	21	12	678
Total	64	571	46	31	26	187	245	767	87	7	149	69	43	2292
17:00	20	158	14	9	10	52	85	215	34	1	48	19	31	696
17:15	12	180	7	10	16	49	80	256	31	0	56	33	20	750
17:30	18	175	16	5	11	45	98	208	30	1	45	38	20	710
17:45	11	199	13	6	9	36	95	261	32	5	47	26	19	759
Total	61	712	50	30	46	182	358	940	127	7	196	116	90	2915
Grand Total	253	2389	163	165	203	841	897	2721	403	26	521	268	239	9089
Apprch %	9	85.2	5.8	13.6	16.8	69.6	22.2	67.2	10	0.6	50.7	26.1	23.2	
Total %	2.8	26.3	1.8	1.8	2.2	9.3	9.9	29.9	4.4	0.3	5.7	2.9	2.6	

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Tustin, CA. 92780

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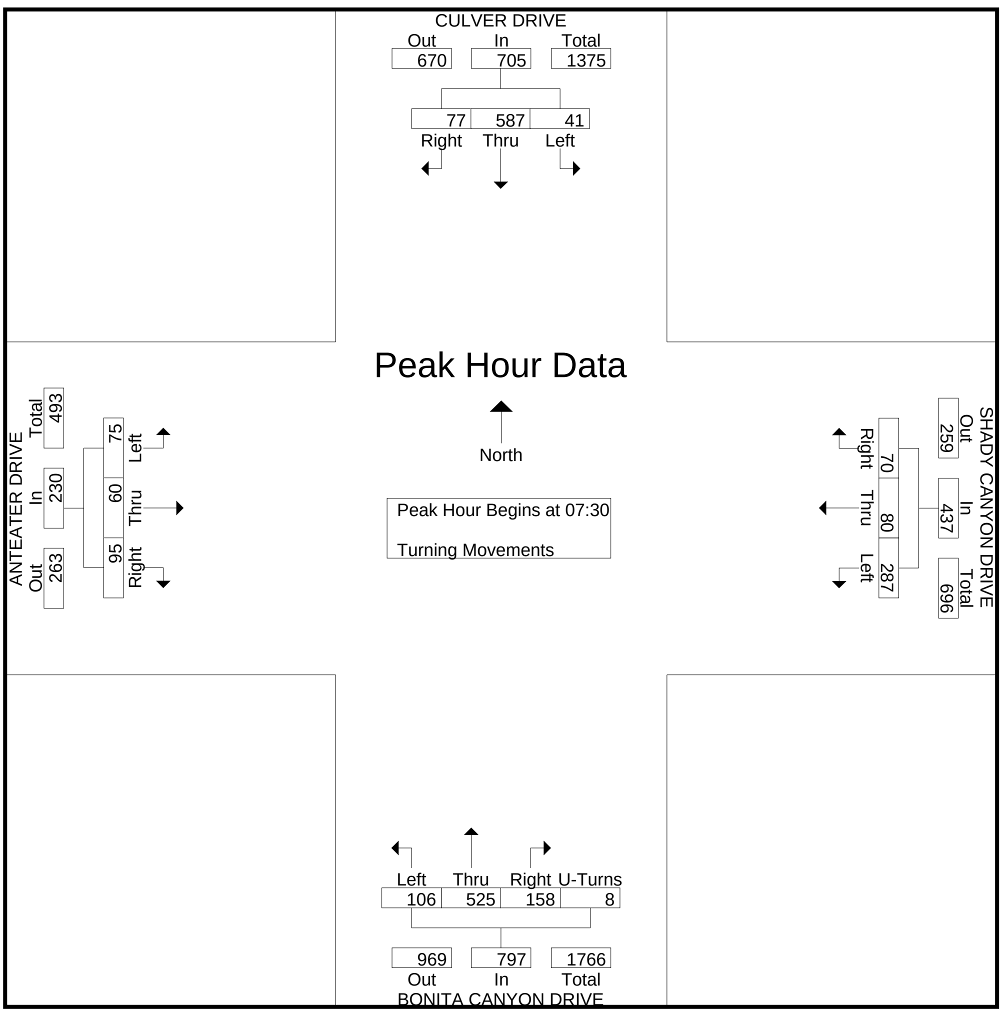
	CULVER DRIVE Southbound				SHADY CANYON DRIVE Westbound				BONITA CANYON DRIVE Northbound					ANTEATER DRIVE Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	U-Turns	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1																		
Peak Hour for Entire Intersection Begins at 07:30																		
07:30	15	143	6	164	18	9	72	99	36	123	22	1	182	13	28	36	77	522
07:45	30	139	**17**	**186**	**36**	**32**	**84**	**152**		**148**	**37**	1	**227**	**31**	8	16	55	**620**
08:00	**15**	**156**	11	182	6	15	64	85	**49**	107	21	**4**	181	24	15	12	51	499
08:15	17	149	7	173	10	24	67	101	32	147	26	2	207	27	9	11	47	528
Total Volume	77	587	41	705	70	80	287	437	158	525	106	8	797	95	60	75	230	2169
% App. Total	10.9	83.3	5.8		16	18.3	65.7		19.8	65.9	13.3	1		41.3	26.1	32.6		
PHF	.642	.941	.603	.948	.486	.625	.854	.719	.806	.887	.716	.500	.878	.766	.536	.521	.747	.875



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2640 Walnut Avenue, Suite L
Tustin, CA. 92780

File Name : H1610019
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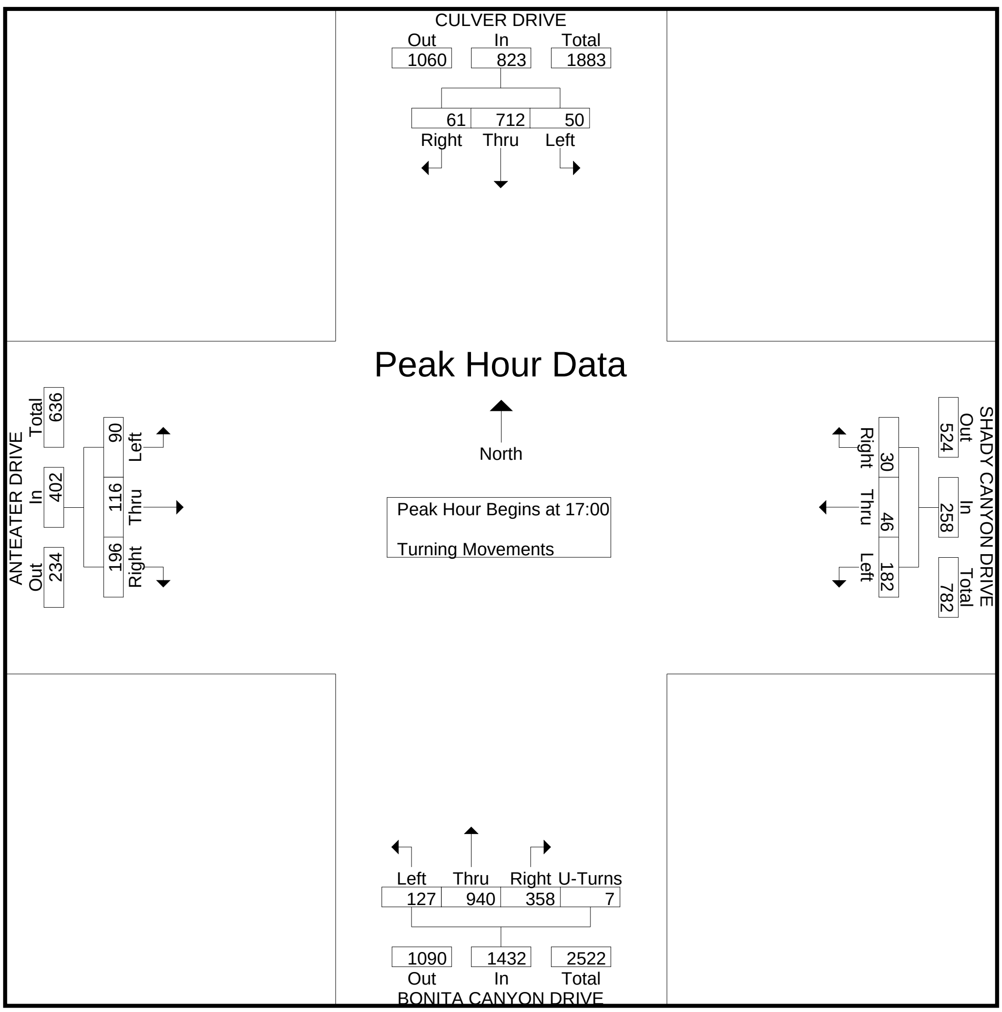
	CULVER DRIVE Southbound				SHADY CANYON DRIVE Westbound				BONITA CANYON DRIVE Northbound					ANTEATER DRIVE Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	U-Turns	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1																		
Peak Hour for Entire Intersection Begins at 17:00																		
17:00	20	158	14	192	9	10	52	71	85	215	34	1	335	48	19	31	98	696
17:15	12	180	7	199	**10**	**16**	49	**75**						**56**	33	20	**109**	750
17:30	18	175	**16**	209	5	11	45	61	**98**	208	30	1	337	45	**38**	20	103	710
17:45	11	**199**	13	**223**						**261**	32	**5**	**393**					**759**
Total Volume	61	712	50	823	30	46	182	258	358	940	127	7	1432	196	116	90	402	2915
% App. Total	7.4	86.5	6.1		11.6	17.8	70.5		25	65.6	8.9	0.5		48.8	28.9	22.4		
PHF	.763	.894	.781	.923	.750	.719	.875	.860	.913	.900	.934	.350	.911	.875	.763	.726	.922	.960



Appendix B ICU CALCULATION WORKSHEETS

Peak hour intersection volume/capacity ratios at the signalized study intersections are calculated by means of intersection capacity utilization (ICU) values.

The procedure is based on the critical movement methodology, and shows the amount of capacity utilized by each critical move. A capacity of 1,700 vehicles per hour (VPH) per lane is assumed together with a .05 clearance interval. A "de-facto" right-turn lane is used in the ICU calculation for cases where a curb lane is wide enough to separately serve both through and right-turn traffic (typically with a width of 19 feet from curb to outside of through-lane with parking prohibited during peak periods). Such lanes are treated the same as striped right-turn lanes during the ICU calculations, but they are denoted on the ICU calculation worksheets using the letter "d" in place of a numerical entry for right-turn lanes.

The methodology also incorporates a check for right-turn capacity utilization. Both right-turn-on-green (RTOG) and right-turn-on-red (RTOR) capacity availability are calculated and checked against the total right-turn capacity need. If insufficient capacity is available, then an adjustment is made to the total capacity utilization value. The following example shows how this adjustment is made.

Example for Northbound Right

1. Right-Turn-On-Green (RTOG)

If NBT is critical move, then:

RTOG = V/C (NBT)

Otherwise,

RTOG = V/C (NBL) + V/C (SBT) - V/C (SBL)

2. Right-Turn-On-Red (RTOR)

If WBL is critical move, then:

RTOR = V/C (WBL)

Otherwise,

RTOR = V/C (EBL) + V/C (WBT) - V/C (EBT)

3. Right-Turn Overlap Adjustment

If the northbound right is assumed to overlap with the adjacent westbound left, adjustments to the RTOG and RTOR values are made as follows:

RTOG = RTOG + V/C (WBL)

RTOR = RTOR - V/C (WBL)

4. Total Right-Turn Capacity (RTC) Availability for NBR

RTC = RTOG + factor x RTOR

Where factor = RTOR saturation flow factor (75%)

Right-turn adjustment is then as follows:

Additional ICU = V/C (NBR) - RTC

A zero or negative value indicates that adequate capacity is available and no adjustment is necessary. A positive value indicates that the available RTOR and RTOG capacity does not adequately accommodate the right-turn V/C; therefore, the right-turn is essentially considered to be a critical movement. In such cases, the right-turn adjustment is noted on the ICU worksheet and it is included in the total capacity utilization value. When it is determined that a right-turn adjustment is required for more than one right-turn movement, the word "multi" is printed on the worksheet instead of an actual right-turn movement reference, and the right-turn adjustments are cumulatively added to the total capacity utilization value. In such cases, further operational evaluation is typically carried out to determine if under actual operational conditions, the critical right-turns would operate simultaneously, and therefore a right-turn adjustment credit should be applied.

Shared Lane V/C Methodology

For intersection approaches where shared usage of a lane is permitted by more than one turn movement (e.g., left/through, through/right, left/through/right), the individual turn volumes are evaluated to determine whether dedication of the shared lane is warranted to any one given turn movement. The following example demonstrates how this evaluation is carried out:

Example for Shared Left/Through Lane

1. Average Lane Volume (ALV)

$$ALV = \frac{\text{Left-Turn Volume + Through Volume}}{\text{Total Left + Through Approach Lanes (including shared lane)}}$$

2. ALV for Each Approach

$$\text{ALV (Left)} = \frac{\text{Left-Turn Volume}}{\text{Left Approach Lanes (including shared lane)}}$$

$$\text{ALV (Through)} = \frac{\text{Through Volume}}{\text{Through Approach Lanes (including shared lane)}}$$

3. Lane Dedication is Warranted

If ALV (Left) is greater than ALV, then full dedication of the shared lane to the left-turn approach is warranted. Left-turn and through V/C ratios for this case are calculated as follows:

$$\text{V/C (Left)} = \frac{\text{Left-Turn Volume}}{\text{Left Approach Capacity (including shared lane)}}$$

$$\text{V/C (Through)} = \frac{\text{Through Volume}}{\text{Through Approach Capacity (excluding shared lane)}}$$

Similarly, if ALV (Through) is greater than ALV then full dedication to the through approach is warranted, and left-turn and through V/C ratios are calculated as follows:

$$\text{V/C (Left)} = \frac{\text{Left-Turn Volume}}{\text{Left Approach Capacity (excluding shared lane)}}$$

$$\text{V/C (Through)} = \frac{\text{Through Volume}}{\text{Through Approach Capacity (including shared lane)}}$$

4. Lane Dedication is not Warranted

If ALV (Left) and ALV (Through) are both less than ALV, the left/through lane is assumed to be truly shared and each left, left/through or through approach lane carries an evenly distributed volume of traffic equal to ALV. A combined left/through V/C ratio is calculated as follows:

$$\text{V/C (Left/Through)} = \frac{\text{Left-Turn Volume + Through Volume}}{\text{Total Left + Through Approach Capacity (including shared lane)}}$$

This V/C (Left/Through) ratio is assigned as the V/C (Through) ratio for the critical movement analysis and ICU summary listing.

If split phasing has not been designated for this approach, the relative proportion of V/C (Through) that is attributed to the left-turn volume is estimated as follows:

If approach has more than one left-turn lane (including shared lane), then:

V/C (Left) = V/C (Through)

If approach has only one left-turn lane (shared lane), then:

$$\text{V/C (Left)} = \frac{\text{Left-Turn Volume}}{\text{Single Approach Lane Capacity}}$$

If this left-turn movement is determined to be a critical movement, the V/C (Left) value is posted in brackets on the ICU summary printout.

These same steps are carried out for shared through/right lanes. If full dedication of a shared through/right lane to the right-turn movement is warranted, the right-turn V/C value calculated in step three is checked against the RTOR and RTOG capacity availability if the option to include right-turns in the V/C ratio calculations is selected. If the V/C value that is determined using the shared lane methodology described here is reduced due to RTOR and RTOG capacity availability, the V/C value for the through/right lanes is posted in brackets.

When an approach contains more than one shared lane (e.g., left/through and through/right), steps one and two listed above are carried out for the three turn movements combined. Step four is carried out if dedication is not warranted for either of the shared lanes. If dedication of one of the shared lanes is warranted to one movement or another, step three is carried out for the two movements involved, and then steps one through four are repeated for the two movements involved in the other shared lane.

1. E.Peltason Dr & Bison Ave

Existing

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1	1700	357	.21*	432	.25*
NBT	1	1700	107	.06	109	.06
NBR	d	1700	44	.03	32	.02
SBL	1	1700	163	.10	91	.05
SBT	1	1700	71	.04*	131	.08*
SBR	1	1700	112	.07	154	.09
EBL	0	0	117		180	{.11}*
EBT	1	1700	234	.21*	40	.13
EBR	1	1700	446	.26	452	.27
WBL	0	0	24	{.01}*	107	
WBT	1	1700	18	.02	132	.14*
WBR	1	1700	51	.03	176	.10
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				**.52**		**.63**

3. California Ave & Bison Ave

Existing

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1	1700	18	.01*	214	.13*
NBT	2	3400	25	.01	232	.07
NBR	d	1700	3	.00	16	.01
SBL	1	1700	85	.05	95	.06
SBT	1.5	5100	365	.11*	21	.01*
SBR	1.5		93		627	.18
EBL	1	1700	465	.27*	123	.07*
EBT	2	3400	847	.25	402	.12
EBR	1	1700	271	.16	40	.02
WBL	1	1700	4	.00	7	.00
WBT	2	3400	247	.07*	769	.23*
WBR	d	1700	75	.04	62	.04
Right Turn Adjustment					SBR	.12*
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				**.51**		**.61**

4. SR-73 NB Ramps & Bison Ave

Existing

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1.5		154	{.08}*	105	.03*
NBT	0	5100	1	.08	1	
NBR	1.5		276		46	
SBL	0	0	0		0	
SBT	0	0	0		0	
SBR	0	0	0		0	
EBL	1	1700	43	.03	36	.02*
EBT	2	3400	1335	.39*	513	.15
EBR	0	0	0		0	
WBL	0	0	0		0	
WBT	2	3400	124	.04	675	.20*
WBR	1	1700	225	.13	939	.55
Right Turn Adjustment					WBR	.33*
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				**.52**		**.63**

5. SR-73 SB Ramps & Bison Ave (06/2017)

Existing

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	0	0	0		0	
NBT	0	0	0		0	
NBR	0	0	0		0	
SBL	2	3400	813	.24*	304	.09*
SBT	0	0	0		0	
SBR	1	1700	372	.22	148	.09
EBL	0	0	0		0	
EBT	2	3400	329	.10*	194	.06
EBR	1	1700	87	.05	154	.09
WBL	2	3400	33	.01*	215	.06
WBT	2	3400	311	.09	433	.13*
WBR	0	0	0		0	
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				**.40**		**.27**

7. Anteater & E Peltason

Existing

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1	1700	241	.14*	156	.09*
NBT	1	1700	53	.03	7	.00
NBR	1	1700	90	.05	101	.06
SBL	1	1700	10	.01	250	.15
SBT	1	1700	7	.02*	50	.09*
SBR	0	0	23		95	
EBL	1	1700	98	.06*	13	.01
EBT	1	1700	258	.15	408	.24*
EBR	1	1700	93	.05	291	.17
WBL	1	1700	54	.03	195	.11*
WBT	2	3400	302	.16*	261	.09
WBR	0	0	255		61	
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				**.43**		**.58**

8. E Peltason/Berkeley & Campus

Existing

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1	1700	115	.07*	233	.14*
NBT	2	3400	110	.03	381	.11
NBR	d	1700	63	.04	234	.14
SBL	1	1700	57	.03	30	.02
SBT	2	3400	309	.09*	139	.04*
SBR	d	1700	21	.01	34	.02
EBL	1	1700	11	.01	25	.01
EBT	2	3400	188	.06*	674	.20*
EBR	d	1700	183	.11	157	.09
WBL	1	1700	214	.13*	107	.06*
WBT	2	3400	524	.15	454	.13
WBR	d	1700	7	.00	14	.01
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				**.40**		**.49**

9. Anteater/Shady Canyon & Culver/Bonita Canyon_(s

Existing

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	2	3400	287	.08	182	.05
NBT	1	1700	80	.09*	46	.04*
NBR	0	0	70		30	
SBL	1	1700	75	.04*	90	.05*
SBT	2	3400	60	.02	116	.03
SBR	1	1700	95	.06	196	.12
EBL	2	3400	114	.03*	134	.04
EBT	2	3400	525	.15	940	.28*
EBR	1	1700	158	.09	358	.21
WBL	1	1700	41	.02	50	.03*
WBT	2	3400	587	.17*	712	.21
WBR	1	1700	77	.05	61	.04
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				**.38**		**.45**

1. E.Peltason Dr & Bison Ave

2020 No Project

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1	1700	378	.22*	458	.27*
NBT	1	1700	113	.07	116	.07
NBR	d	1700	47	.03	34	.02
SBL	1	1700	173	.10	96	.06
SBT	1	1700	75	.04*	139	.08*
SBR	1	1700	119	.07	163	.10
EBL	0	0	124		191	{.11}*
EBT	1	1700	248	.22*	42	.14
EBR	1	1700	473	.28	479	.28
WBL	0	0	25	{.01}*	113	
WBT	1	1700	19	.03	140	.15*
WBR	1	1700	54	.03	187	.11
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				**.54**		**.66**

2020 With Project

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1	1700	378	.22*	460	.27*
NBT	1	1700	113	.07	117	.07
NBR	d	1700	47	.03	34	.02
SBL	1	1700	173	.10	96	.06
SBT	1	1700	76	.04*	139	.08*
SBR	1	1700	119	.07	163	.10
EBL	0	0	124		191	{.11}*
EBT	1	1700	248	.22*	42	.14
EBR	1	1700	475	.28	479	.28
WBL	0	0	25	{.01}*	113	
WBT	1	1700	19	.03	140	.15*
WBR	1	1700	54	.03	187	.11
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				**.54**		**.66**

3. California Ave & Bison Ave

2020 No Project

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1	1700	19	.01*	227	.13*
NBT	2	3400	26	.01	246	.07
NBR	d	1700	3	.00	17	.01
SBL	1	1700	90	.05	101	.06
SBT	1.5	5100	387	.11*	22	.01*
SBR	1.5		99		665	.20
EBL	1	1700	493	.29*	130	.08*
EBT	2	3400	898	.26	426	.13
EBR	1	1700	287	.17	42	.02
WBL	1	1700	4	.00	7	.00
WBT	2	3400	262	.08*	815	.24*
WBR	d	1700	79	.05	66	.04
Right Turn Adjustment					SBR	.13*
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				**.54**		**.64**

2020 With Project

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1	1700	19	.01*	227	.13*
NBT	2	3400	26	.01	246	.07
NBR	d	1700	3	.00	17	.01
SBL	1	1700	90	.05	101	.06
SBT	1.5	5100	387	.11*	22	.01*
SBR	1.5		99		665	.20
EBL	1	1700	493	.29*	130	.08*
EBT	2	3400	900	.26	426	.13
EBR	1	1700	287	.17	42	.02
WBL	1	1700	4	.00	7	.00
WBT	2	3400	262	.08*	817	.24*
WBR	d	1700	79	.05	66	.04
Right Turn Adjustment					SBR	.13*
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				**.54**		**.64**

4. SR-73 NB Ramps & Bison Ave

2020 No Project

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1.5		163	{.09}*	111	.03*
NBT	0	5100	1	.09	1	
NBR	1.5		293		49	
SBL	0	0	0		0	
SBT	0	0	0		0	
SBR	0	0	0		0	
EBL	1	1700	46	.03	38	.02*
EBT	2	3400	1415	.42*	544	.16
EBR	0	0	0		0	
WBL	0	0	0		0	
WBT	2	3400	131	.04	715	.21*
WBR	1	1700	238	.14	995	.59
Right Turn Adjustment					WBR	.36*
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				**.56**		**.67**

2020 With Project

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1.5		163	{.09}*	111	.03*
NBT	0	5100	1	.09	1	
NBR	1.5		293		49	
SBL	0	0	0		0	
SBT	0	0	0		0	
SBR	0	0	0		0	
EBL	1	1700	46	.03	38	.02*
EBT	2	3400	1417	.42*	544	.16
EBR	0	0	0		0	
WBL	0	0	0		0	
WBT	2	3400	131	.04	716	.21*
WBR	1	1700	238	.14	996	.59
Right Turn Adjustment					WBR	.36*
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				**.56**		**.67**

5. SR-73 SB Ramps & Bison Ave

2020 No Project

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	0	0	0		0	
NBT	0	0	0		0	
NBR	0	0	0		0	
SBL	2	3400	862	.25*	322	.09*
SBT	0	0	0		0	
SBR	1	1700	394	.23	157	.09
EBL	0	0	0		0	
EBT	2	3400	349	.10*	206	.06
EBR	1	1700	92	.05	163	.10
WBL	2	3400	35	.01*	228	.07
WBT	2	3400	330	.10	459	.14*
WBR	0	0	0		0	
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				**.41**		**.28**

2020 With Project

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	0	0	0		0	
NBT	0	0	0		0	
NBR	0	0	0		0	
SBL	2	3400	863	.25*	322	.09*
SBT	0	0	0		0	
SBR	1	1700	394	.23	157	.09
EBL	0	0	0		0	
EBT	2	3400	350	.10*	206	.06
EBR	1	1700	92	.05	163	.10
WBL	2	3400	35	.01*	228	.07
WBT	2	3400	330	.10	460	.14*
WBR	0	0	0		0	
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				**.41**		**.28**

7. **Anteater & E Peltason**

2020 No Project

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1	1700	255	.15*	165	.10*
NBT	1	1700	56	.03	7	.00
NBR	1	1700	95	.06	107	.06
SBL	1	1700	11	.01	265	.16
SBT	1	1700	7	.02*	53	.09*
SBR	0	0	24		101	
EBL	1	1700	104	.06*	14	.01
EBT	1	1700	273	.16	432	.25*
EBR	1	1700	99	.06	308	.18
WBL	1	1700	57	.03	207	.12*
WBT	2	3400	320	.17*	277	.10
WBR	0	0	270		65	
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				**.45**		**.61**

2020 With Project

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1	1700	256	.15*	165	.10*
NBT	1	1700	56	.03	7	.00
NBR	1	1700	95	.06	107	.06
SBL	1	1700	11	.01	265	.16
SBT	1	1700	7	.02*	53	.09*
SBR	0	0	24		101	
EBL	1	1700	104	.06*	14	.01
EBT	1	1700	274	.16	436	.26*
EBR	1	1700	99	.06	309	.18
WBL	1	1700	57	.03	207	.12*
WBT	2	3400	325	.18*	278	.10
WBR	0	0	270		65	
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				**.46**		**.62**

8. **E Peltason/Berkeley & Campus**

2020 No Project

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1	1700	122	.07*	247	.15*
NBT	2	3400	117	.03	404	.12
NBR	d	1700	67	.04	248	.15
SBL	1	1700	60	.04	32	.02
SBT	2	3400	328	.10*	147	.04*
SBR	d	1700	22	.01	36	.02
EBL	1	1700	12	.01	26	.02
EBT	2	3400	199	.06*	714	.21*
EBR	d	1700	194	.11	166	.10
WBL	1	1700	227	.13*	113	.07*
WBT	2	3400	555	.16	481	.14
WBR	d	1700	7	.00	15	.01
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				**.41**		**.52**

2020 With Project

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	1	1700	122	.07*	248	.15*
NBT	2	3400	117	.03	405	.12
NBR	d	1700	67	.04	250	.15
SBL	1	1700	60	.04	32	.02
SBT	2	3400	330	.10*	147	.04*
SBR	d	1700	22	.01	36	.02
EBL	1	1700	12	.01	26	.02
EBT	2	3400	199	.06*	714	.21*
EBR	d	1700	195	.11	166	.10
WBL	1	1700	229	.13*	114	.07*
WBT	2	3400	555	.16	481	.14
WBR	d	1700	7	.00	15	.01
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				**.41**		**.52**

9. Anteater/Shady Canyon & Culver/Bonita Canyon_(s

2020 No Project

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	2	3400	304	.09	193	.06
NBT	1	1700	85	.09*	49	.05*
NBR	0	0	74		32	
SBL	1	1700	79	.05*	95	.06*
SBT	2	3400	64	.02	123	.04
SBR	1	1700	101	.06	208	.12
EBL	2	3400	121	.04*	142	.04
EBT	2	3400	556	.16	996	.29*
EBR	1	1700	167	.10	379	.22
WBL	1	1700	43	.03	53	.03*
WBT	2	3400	622	.18*	755	.22
WBR	1	1700	82	.05	65	.04
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				**.41**		**.48**

2020 With Project

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	2	3400	304	.09	193	.06
NBT	1	1700	85	.09*	49	.05*
NBR	0	0	74		32	
SBL	1	1700	79	.05*	95	.06*
SBT	2	3400	64	.02	123	.04
SBR	1	1700	101	.06	209	.12
EBL	2	3400	122	.04*	142	.04
EBT	2	3400	556	.16	996	.29*
EBR	1	1700	167	.10	379	.22
WBL	1	1700	43	.03	53	.03*
WBT	2	3400	622	.18*	755	.22
WBR	1	1700	82	.05	65	.04
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				**.41**		**.48**

2. W Peltason Dr/Academy & W. PEltason Dr (stop si

2020 With Project

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	0	0	3		3	
NBT	1	1700	66	.17*	73	.32*
NBR	0	0	214		471	
SBL	1	1700	28	.02*	181	.11*
SBT	1	1700	92	.05	49	.03
SBR	0	0	0		2	
EBL	0	0	0		1	
EBT	1	1700	3	.00*	2	.01*
EBR	0	0	3		6	
WBL	1	1700	298	.18*	314	.18*
WBT	1	1700	1	.03	4	.02
WBR	0	0	57		36	
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				**.42**		**.67**

6. Los Trancos & E Peltason (stop sign)

2020 With Project

	LANES	CAPACITY	AM PK HOUR VOL	AM PK HOUR V/C	PM PK HOUR VOL	PM PK HOUR V/C
NBL	0	0	136		47	{.03}*
NBT	1	1700	0	.10*	2	.04
NBR	0	0	34		22	
SBL	0	0	12	{.01}*	16	
SBT	1	1700	1	.02	5	.02*
SBR	0	0	14		8	
EBL	1	1700	19	.01	23	.01
EBT	1	1700	504	.32*	713	.47*
EBR	0	0	36		90	
WBL	1	1700	23	.01*	37	.02*
WBT	1	1700	463	.28	567	.35
WBR	0	0	10		29	
Clearance Interval				.05*		.05*
TOTAL CAPACITY UTILIZATION				**.49**		**.59**

Appendix C HCM DELAY CALCULATION WORKSHEETS

Intersection	
Intersection Delay, s/veh	15.4
Intersection LOS	C

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Lane Configurations												
Traffic Vol, veh/h	0	0	3	3	0	281	1	54	0	3	62	202
Future Vol, veh/h	0	0	3	3	0	281	1	54	0	3	62	202
Peak Hour Factor	0.92	0.80	0.80	0.80	0.92	0.80	0.80	0.80	0.92	0.80	0.80	0.80
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	4	4	0	351	1	68	0	4	78	253
Number of Lanes	0	0	1	0	0	1	1	0	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	2	1	2
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	2	1	1
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	2	2
HCM Control Delay	9.6	17.6	14.7
HCM LOS	A	C	B

Lane	NBLn1	EBLn1	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	1%	0%	100%	0%	100%	0%
Vol Thru, %	23%	50%	0%	2%	0%	100%
Vol Right, %	76%	50%	0%	98%	0%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	267	6	281	55	26	86
LT Vol	3	0	281	0	26	0
Through Vol	62	3	0	1	0	86
RT Vol	202	3	0	54	0	0
Lane Flow Rate	334	8	351	69	32	108
Geometry Grp	6	6	7	7	7	7
Degree of Util (X)	0.523	0.013	0.628	0.1	0.062	0.191
Departure Headway (Hd)	5.639	6.451	6.434	5.234	6.891	6.383
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	641	553	562	685	519	561
Service Time	3.676	4.507	4.163	2.963	4.638	4.13
HCM Lane V/C Ratio	0.521	0.014	0.625	0.101	0.062	0.193
HCM Control Delay	14.7	9.6	19.4	8.5	10.1	10.6
HCM Lane LOS	B	A	C	A	B	B
HCM 95th-tile Q	3	0	4.3	0.3	0.2	0.7

Intersection				
Intersection Delay, s/veh				
Intersection LOS				

Movement	SBU	SBL	SBT	SBR
Lane Configurations				
Traffic Vol, veh/h	0	26	86	0
Future Vol, veh/h	0	26	86	0
Peak Hour Factor	0.92	0.80	0.80	0.80
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	33	108	0
Number of Lanes	0	1	1	0

Approach		SB
Opposing Approach		NB
Opposing Lanes		1
Conflicting Approach Left		WB
Conflicting Lanes Left		2
Conflicting Approach Right		EB
Conflicting Lanes Right		1
HCM Control Delay		10.5
HCM LOS		B

Intersection	
Intersection Delay, s/veh	53.3
Intersection LOS	F

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Lane Configurations												
Traffic Vol, veh/h	0	18	475	34	0	22	431	9	0	128	0	32
Future Vol, veh/h	0	18	475	34	0	22	431	9	0	128	0	32
Peak Hour Factor	0.92	0.82	0.82	0.82	0.92	0.82	0.82	0.82	0.92	0.82	0.82	0.82
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	22	579	41	0	27	526	11	0	156	0	39
Number of Lanes	0	1	1	0	0	1	1	0	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	2	2	1
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	1	1	2
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	1	2
HCM Control Delay	75.5	43.5	14.8
HCM LOS	F	E	B

Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1
Vol Left, %	80%	100%	0%	100%	0%	44%
Vol Thru, %	0%	0%	93%	0%	98%	4%
Vol Right, %	20%	0%	7%	0%	2%	52%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	160	18	509	22	440	25
LT Vol	128	18	0	22	0	11
Through Vol	0	0	475	0	431	1
RT Vol	32	0	34	0	9	13
Lane Flow Rate	195	22	621	27	537	30
Geometry Grp	2	7	7	7	7	2
Degree of Util (X)	0.384	0.041	1.058	0.05	0.919	0.064
Departure Headway (Hd)	7.334	6.695	6.138	6.865	6.341	7.912
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	494	533	590	525	574	455
Service Time	5.334	4.452	3.895	4.565	4.041	5.912
HCM Lane V/C Ratio	0.395	0.041	1.053	0.051	0.936	0.066
HCM Control Delay	14.8	9.7	77.8	9.9	45.2	11.5
HCM Lane LOS	B	A	F	A	E	B
HCM 95th-tile Q	1.8	0.1	17.4	0.2	11.4	0.2

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Lane Configurations			✥	
Traffic Vol, veh/h	0	11	1	13
Future Vol, veh/h	0	11	1	13
Peak Hour Factor	0.92	0.82	0.82	0.82
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	13	1	16
Number of Lanes	0	0	1	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	1
Conflicting Approach Left	WB
Conflicting Lanes Left	2
Conflicting Approach Right	EB
Conflicting Lanes Right	2
HCM Control Delay	11.5
HCM LOS	B

Intersection	
Intersection Delay, s/veh	39.8
Intersection LOS	E

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Lane Configurations												
Traffic Vol, veh/h	0	1	2	6	0	296	4	34	0	3	68	444
Future Vol, veh/h	0	1	2	6	0	296	4	34	0	3	68	444
Peak Hour Factor	0.92	0.87	0.87	0.87	0.92	0.87	0.87	0.87	0.92	0.87	0.87	0.87
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	1	2	7	0	340	5	39	0	3	78	510
Number of Lanes	0	0	1	0	0	1	1	0	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	2	1	2
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	2	1	1
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	2	2
HCM Control Delay	11.4	25.7	60.1
HCM LOS	B	D	F

Lane	NBLn1	EBLn1	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	1%	11%	100%	0%	100%	0%
Vol Thru, %	13%	22%	0%	11%	0%	96%
Vol Right, %	86%	67%	0%	89%	0%	4%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	515	9	296	38	171	48
LT Vol	3	1	296	0	171	0
Through Vol	68	2	0	4	0	46
RT Vol	444	6	0	34	0	2
Lane Flow Rate	592	10	340	44	197	55
Geometry Grp	6	6	7	7	7	7
Degree of Util (X)	0.995	0.023	0.721	0.079	0.416	0.108
Departure Headway (Hd)	6.05	8.1	7.625	6.473	7.612	7.069
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	604	440	476	554	474	507
Service Time	4.072	6.176	5.353	4.201	5.358	4.814
HCM Lane V/C Ratio	0.98	0.023	0.714	0.079	0.416	0.108
HCM Control Delay	60.1	11.4	27.7	9.8	15.7	10.7
HCM Lane LOS	F	B	D	A	C	B
HCM 95th-tile Q	14.7	0.1	5.7	0.3	2	0.4

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Lane Configurations				
Traffic Vol, veh/h	0	171	46	2
Future Vol, veh/h	0	171	46	2
Peak Hour Factor	0.92	0.87	0.87	0.87
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	197	53	2
Number of Lanes	0	1	1	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	1
Conflicting Approach Left	WB
Conflicting Lanes Left	2
Conflicting Approach Right	EB
Conflicting Lanes Right	1
HCM Control Delay	14.6
HCM LOS	B

Intersection	
Intersection Delay, s/veh	129.8
Intersection LOS	F

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Lane Configurations												
Traffic Vol, veh/h	0	22	668	85	0	35	534	27	0	44	2	21
Future Vol, veh/h	0	22	668	85	0	35	534	27	0	44	2	21
Peak Hour Factor	0.92	0.84	0.84	0.84	0.92	0.84	0.84	0.84	0.92	0.84	0.84	0.84
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	26	795	101	0	42	636	32	0	52	2	25
Number of Lanes	0	1	1	0	0	1	1	0	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	2	2	1
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	1	1	2
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	1	2
HCM Control Delay	194.3	64.7	12.3
HCM LOS	F	F	B

Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1
Vol Left, %	66%	100%	0%	100%	0%	54%
Vol Thru, %	3%	0%	89%	0%	95%	18%
Vol Right, %	31%	0%	11%	0%	5%	29%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	67	22	753	35	561	28
LT Vol	44	22	0	35	0	15
Through Vol	2	0	668	0	534	5
RT Vol	21	0	85	0	27	8
Lane Flow Rate	80	26	896	42	668	33
Geometry Grp	2	7	7	7	7	2
Degree of Util (X)	0.157	0.045	1.384	0.07	1.029	0.067
Departure Headway (Hd)	7.813	6.262	5.675	6.489	5.947	8.098
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	462	575	645	555	614	445
Service Time	5.813	3.962	3.375	4.189	3.647	6.098
HCM Lane V/C Ratio	0.173	0.045	1.389	0.076	1.088	0.074
HCM Control Delay	12.3	9.3	199.7	9.7	68.1	11.7
HCM Lane LOS	B	A	F	A	F	B
HCM 95th-tile Q	0.6	0.1	38.9	0.2	16.4	0.2

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Lane Configurations			✥	
Traffic Vol, veh/h	0	15	5	8
Future Vol, veh/h	0	15	5	8
Peak Hour Factor	0.92	0.84	0.84	0.84
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	18	6	10
Number of Lanes	0	0	1	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	1
Conflicting Approach Left	WB
Conflicting Lanes Left	2
Conflicting Approach Right	EB
Conflicting Lanes Right	2
HCM Control Delay	11.7
HCM LOS	B

Intersection	
Intersection Delay, s/veh	16.9
Intersection LOS	C

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Lane Configurations												
Traffic Vol, veh/h	0	0	3	3	0	298	1	57	0	3	66	214
Future Vol, veh/h	0	0	3	3	0	298	1	57	0	3	66	214
Peak Hour Factor	0.92	0.80	0.80	0.80	0.92	0.80	0.80	0.80	0.92	0.80	0.80	0.80
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	4	4	0	373	1	71	0	4	83	268
Number of Lanes	0	0	1	0	0	1	1	0	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	2	1	2
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	2	1	1
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	2	2
HCM Control Delay	9.8	19.7	16
HCM LOS	A	C	C

Lane	NBLn1	EBLn1	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	1%	0%	100%	0%	100%	0%
Vol Thru, %	23%	50%	0%	2%	0%	100%
Vol Right, %	76%	50%	0%	98%	0%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	283	6	298	58	28	91
LT Vol	3	0	298	0	28	0
Through Vol	66	3	0	1	0	91
RT Vol	214	3	0	57	0	0
Lane Flow Rate	354	8	372	72	35	114
Geometry Grp	6	6	7	7	7	7
Degree of Util (X)	0.565	0.014	0.676	0.107	0.068	0.206
Departure Headway (Hd)	5.751	6.637	6.534	5.333	7.039	6.53
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	626	537	555	671	508	548
Service Time	3.793	4.705	4.271	3.069	4.796	4.286
HCM Lane V/C Ratio	0.565	0.015	0.67	0.107	0.069	0.208
HCM Control Delay	16	9.8	21.9	8.7	10.3	11
HCM Lane LOS	C	A	C	A	B	B
HCM 95th-tile Q	3.5	0	5.1	0.4	0.2	0.8

Intersection				
Intersection Delay, s/veh				
Intersection LOS				

Movement	SBU	SBL	SBT	SBR
Lane Configurations				
Traffic Vol, veh/h	0	28	91	0
Future Vol, veh/h	0	28	91	0
Peak Hour Factor	0.92	0.80	0.80	0.80
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	35	114	0
Number of Lanes	0	1	1	0

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

Intersection	
Intersection Delay, s/veh	73.8
Intersection LOS	F

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Lane Configurations												
Traffic Vol, veh/h	0	19	503	36	0	23	457	10	0	136	0	34
Future Vol, veh/h	0	19	503	36	0	23	457	10	0	136	0	34
Peak Hour Factor	0.92	0.82	0.82	0.82	0.92	0.82	0.82	0.82	0.92	0.82	0.82	0.82
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	23	613	44	0	28	557	12	0	166	0	41
Number of Lanes	0	1	1	0	0	1	1	0	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	2	2	1
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	1	1	2
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	1	2
HCM Control Delay	107.1	59.3	15.8
HCM LOS	F	F	C

Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1
Vol Left, %	80%	100%	0%	100%	0%	44%
Vol Thru, %	0%	0%	93%	0%	98%	4%
Vol Right, %	20%	0%	7%	0%	2%	52%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	170	19	539	23	467	27
LT Vol	136	19	0	23	0	12
Through Vol	0	0	503	0	457	1
RT Vol	34	0	36	0	10	14
Lane Flow Rate	207	23	657	28	570	33
Geometry Grp	2	7	7	7	7	2
Degree of Util (X)	0.415	0.044	1.153	0.053	0.993	0.071
Departure Headway (Hd)	7.577	6.872	6.314	7.055	6.528	8.298
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	479	521	578	511	558	434
Service Time	5.577	4.618	4.06	4.755	4.228	6.298
HCM Lane V/C Ratio	0.432	0.044	1.137	0.055	1.022	0.076
HCM Control Delay	15.8	9.9	110.5	10.1	61.7	11.9
HCM Lane LOS	C	A	F	B	F	B
HCM 95th-tile Q	2	0.1	22	0.2	14.1	0.2

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Lane Configurations			✥	
Traffic Vol, veh/h	0	12	1	14
Future Vol, veh/h	0	12	1	14
Peak Hour Factor	0.92	0.82	0.82	0.82
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	15	1	17
Number of Lanes	0	0	1	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	1
Conflicting Approach Left	WB
Conflicting Lanes Left	2
Conflicting Approach Right	EB
Conflicting Lanes Right	2
HCM Control Delay	11.9
HCM LOS	B

Intersection	
Intersection Delay, s/veh	50.3
Intersection LOS	F

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Lane Configurations												
Traffic Vol, veh/h	0	1	2	6	0	314	4	36	0	3	72	471
Future Vol, veh/h	0	1	2	6	0	314	4	36	0	3	72	471
Peak Hour Factor	0.92	0.87	0.87	0.87	0.92	0.87	0.87	0.87	0.92	0.87	0.87	0.87
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	1	2	7	0	361	5	41	0	3	83	541
Number of Lanes	0	0	1	0	0	1	1	0	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	2	1	2
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	2	1	1
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	2	2
HCM Control Delay	11.7	28.6	79.8
HCM LOS	B	D	F

Lane	NBLn1	EBLn1	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	1%	11%	100%	0%	100%	0%
Vol Thru, %	13%	22%	0%	10%	0%	96%
Vol Right, %	86%	67%	0%	90%	0%	4%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	546	9	314	40	181	51
LT Vol	3	1	314	0	181	0
Through Vol	72	2	0	4	0	49
RT Vol	471	6	0	36	0	2
Lane Flow Rate	628	10	361	46	208	59
Geometry Grp	6	6	7	7	7	7
Degree of Util (X)	1.064	0.023	0.757	0.082	0.437	0.115
Departure Headway (Hd)	6.106	8.459	7.796	6.638	7.828	7.285
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	590	426	466	543	464	495
Service Time	4.172	6.459	5.496	4.338	5.528	4.985
HCM Lane V/C Ratio	1.064	0.023	0.775	0.085	0.448	0.119
HCM Control Delay	79.8	11.7	31	9.9	16.5	10.9
HCM Lane LOS	F	B	D	A	C	B
HCM 95th-tile Q	17.8	0.1	6.4	0.3	2.2	0.4

Intersection				
Intersection Delay, s/veh				
Intersection LOS				

Movement	SBU	SBL	SBT	SBR
Lane Configurations				
Traffic Vol, veh/h	0	181	49	2
Future Vol, veh/h	0	181	49	2
Peak Hour Factor	0.92	0.87	0.87	0.87
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	208	56	2
Number of Lanes	0	1	1	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	1
Conflicting Approach Left	WB
Conflicting Lanes Left	2
Conflicting Approach Right	EB
Conflicting Lanes Right	1
HCM Control Delay	15.3
HCM LOS	C

Intersection	
Intersection Delay, s/veh	157.3
Intersection LOS	F

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Lane Configurations												
Traffic Vol, veh/h	0	23	708	90	0	37	566	29	0	47	2	22
Future Vol, veh/h	0	23	708	90	0	37	566	29	0	47	2	22
Peak Hour Factor	0.92	0.84	0.84	0.84	0.92	0.84	0.84	0.84	0.92	0.84	0.84	0.84
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	27	843	107	0	44	674	35	0	56	2	26
Number of Lanes	0	1	1	0	0	1	1	0	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	2	2	1
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	1	1	2
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	1	2
HCM Control Delay	230.3	85.4	12.6
HCM LOS	F	F	B

Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1
Vol Left, %	66%	100%	0%	100%	0%	55%
Vol Thru, %	3%	0%	89%	0%	95%	17%
Vol Right, %	31%	0%	11%	0%	5%	28%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	71	23	798	37	595	29
LT Vol	47	23	0	37	0	16
Through Vol	2	0	708	0	566	5
RT Vol	22	0	90	0	29	8
Lane Flow Rate	85	27	950	44	708	35
Geometry Grp	2	7	7	7	7	2
Degree of Util (X)	0.167	0.047	1.47	0.075	1.099	0.071
Departure Headway (Hd)	8.017	6.355	5.768	6.595	6.052	8.35
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	451	567	637	547	602	432
Service Time	6.017	4.055	3.468	4.295	3.752	6.35
HCM Lane V/C Ratio	0.188	0.048	1.491	0.08	1.176	0.081
HCM Control Delay	12.6	9.4	236.7	9.8	90.1	12
HCM Lane LOS	B	A	F	A	F	B
HCM 95th-tile Q	0.6	0.1	44.4	0.2	19.8	0.2

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Lane Configurations				
Traffic Vol, veh/h	0	16	5	8
Future Vol, veh/h	0	16	5	8
Peak Hour Factor	0.92	0.84	0.84	0.84
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	19	6	10
Number of Lanes	0	0	1	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	1
Conflicting Approach Left	WB
Conflicting Lanes Left	2
Conflicting Approach Right	EB
Conflicting Lanes Right	2
HCM Control Delay	12
HCM LOS	B

Intersection	
Intersection Delay, s/veh	16.9
Intersection LOS	C

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Lane Configurations												
Traffic Vol, veh/h	0	0	3	3	0	298	1	57	0	3	66	214
Future Vol, veh/h	0	0	3	3	0	298	1	57	0	3	66	214
Peak Hour Factor	0.92	0.80	0.80	0.80	0.92	0.80	0.80	0.80	0.92	0.80	0.80	0.80
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	4	4	0	373	1	71	0	4	83	268
Number of Lanes	0	0	1	0	0	1	1	0	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	2	1	2
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	2	1	1
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	2	2
HCM Control Delay	9.8	19.8	16.1
HCM LOS	A	C	C

Lane	NBLn1	EBLn1	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	1%	0%	100%	0%	100%	0%
Vol Thru, %	23%	50%	0%	2%	0%	100%
Vol Right, %	76%	50%	0%	98%	0%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	283	6	298	58	28	92
LT Vol	3	0	298	0	28	0
Through Vol	66	3	0	1	0	92
RT Vol	214	3	0	57	0	0
Lane Flow Rate	354	8	372	72	35	115
Geometry Grp	6	6	7	7	7	7
Degree of Util (X)	0.565	0.014	0.677	0.108	0.068	0.209
Departure Headway (Hd)	5.754	6.646	6.541	5.339	7.04	6.531
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	626	536	551	671	508	549
Service Time	3.799	4.713	4.276	3.074	4.799	4.29
HCM Lane V/C Ratio	0.565	0.015	0.675	0.107	0.069	0.209
HCM Control Delay	16.1	9.8	22	8.7	10.3	11
HCM Lane LOS	C	A	C	A	B	B
HCM 95th-tile Q	3.5	0	5.1	0.4	0.2	0.8

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Lane Configurations				
Traffic Vol, veh/h	0	28	92	0
Future Vol, veh/h	0	28	92	0
Peak Hour Factor	0.92	0.80	0.80	0.80
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	35	115	0
Number of Lanes	0	1	1	0

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

Intersection	
Intersection Delay, s/veh	75.8
Intersection LOS	F

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Lane Configurations												
Traffic Vol, veh/h	0	19	504	36	0	23	463	10	0	136	0	34
Future Vol, veh/h	0	19	504	36	0	23	463	10	0	136	0	34
Peak Hour Factor	0.92	0.82	0.82	0.82	0.92	0.82	0.82	0.82	0.92	0.82	0.82	0.82
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	23	615	44	0	28	565	12	0	166	0	41
Number of Lanes	0	1	1	0	0	1	1	0	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	2	2	1
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	1	1	2
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	1	2
HCM Control Delay	108.9	62.5	15.9
HCM LOS	F	F	C

Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1
Vol Left, %	80%	100%	0%	100%	0%	44%
Vol Thru, %	0%	0%	93%	0%	98%	4%
Vol Right, %	20%	0%	7%	0%	2%	52%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	170	19	540	23	473	27
LT Vol	136	19	0	23	0	12
Through Vol	0	0	504	0	463	1
RT Vol	34	0	36	0	10	14
Lane Flow Rate	207	23	659	28	577	33
Geometry Grp	2	7	7	7	7	2
Degree of Util (X)	0.416	0.044	1.158	0.053	1.006	0.072
Departure Headway (Hd)	7.603	6.887	6.329	7.065	6.538	8.332
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	477	519	573	510	560	433
Service Time	5.603	4.635	4.077	4.765	4.238	6.332
HCM Lane V/C Ratio	0.434	0.044	1.15	0.055	1.03	0.076
HCM Control Delay	15.9	10	112.4	10.2	65	12
HCM Lane LOS	C	A	F	B	F	B
HCM 95th-tile Q	2	0.1	22.2	0.2	14.6	0.2

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Lane Configurations				
Traffic Vol, veh/h	0	12	1	14
Future Vol, veh/h	0	12	1	14
Peak Hour Factor	0.92	0.82	0.82	0.82
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	15	1	17
Number of Lanes	0	0	1	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	1
Conflicting Approach Left	WB
Conflicting Lanes Left	2
Conflicting Approach Right	EB
Conflicting Lanes Right	2
HCM Control Delay	12
HCM LOS	B

Intersection	
Intersection Delay, s/veh	50.7
Intersection LOS	F

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Lane Configurations												
Traffic Vol, veh/h	0	1	2	6	0	314	4	36	0	3	73	471
Future Vol, veh/h	0	1	2	6	0	314	4	36	0	3	73	471
Peak Hour Factor	0.92	0.87	0.87	0.87	0.92	0.87	0.87	0.87	0.92	0.87	0.87	0.87
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	1	2	7	0	361	5	41	0	3	84	541
Number of Lanes	0	0	1	0	0	1	1	0	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	2	1	2
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	2	1	1
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	2	2
HCM Control Delay	11.7	28.6	80.7
HCM LOS	B	D	F

Lane	NBLn1	EBLn1	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	1%	11%	100%	0%	100%	0%
Vol Thru, %	13%	22%	0%	10%	0%	96%
Vol Right, %	86%	67%	0%	90%	0%	4%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	547	9	314	40	181	51
LT Vol	3	1	314	0	181	0
Through Vol	73	2	0	4	0	49
RT Vol	471	6	0	36	0	2
Lane Flow Rate	629	10	361	46	208	59
Geometry Grp	6	6	7	7	7	7
Degree of Util (X)	1.067	0.023	0.757	0.082	0.437	0.115
Departure Headway (Hd)	6.107	8.466	7.801	6.643	7.832	7.289
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	591	425	466	543	462	495
Service Time	4.173	6.466	5.501	4.343	5.532	4.989
HCM Lane V/C Ratio	1.064	0.024	0.775	0.085	0.45	0.119
HCM Control Delay	80.7	11.7	31	9.9	16.5	10.9
HCM Lane LOS	F	B	D	A	C	B
HCM 95th-tile Q	17.9	0.1	6.4	0.3	2.2	0.4

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Lane Configurations				
Traffic Vol, veh/h	0	181	49	2
Future Vol, veh/h	0	181	49	2
Peak Hour Factor	0.92	0.87	0.87	0.87
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	208	56	2
Number of Lanes	0	1	1	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	1
Conflicting Approach Left	WB
Conflicting Lanes Left	2
Conflicting Approach Right	EB
Conflicting Lanes Right	1
HCM Control Delay	15.3
HCM LOS	C

Intersection	
Intersection Delay, s/veh	160.1
Intersection LOS	F

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Lane Configurations												
Traffic Vol, veh/h	0	23	713	90	0	37	567	29	0	47	2	22
Future Vol, veh/h	0	23	713	90	0	37	567	29	0	47	2	22
Peak Hour Factor	0.92	0.84	0.84	0.84	0.92	0.84	0.84	0.84	0.92	0.84	0.84	0.84
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	27	849	107	0	44	675	35	0	56	2	26
Number of Lanes	0	1	1	0	0	1	1	0	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	2	2	1
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	1	1	2
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	1	2
HCM Control Delay	234.6	86.1	12.6
HCM LOS	F	F	B

Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1
Vol Left, %	66%	100%	0%	100%	0%	55%
Vol Thru, %	3%	0%	89%	0%	95%	17%
Vol Right, %	31%	0%	11%	0%	5%	28%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	71	23	803	37	596	29
LT Vol	47	23	0	37	0	16
Through Vol	2	0	713	0	567	5
RT Vol	22	0	90	0	29	8
Lane Flow Rate	85	27	956	44	710	35
Geometry Grp	2	7	7	7	7	2
Degree of Util (X)	0.167	0.047	1.48	0.075	1.101	0.071
Departure Headway (Hd)	8.032	6.356	5.77	6.602	6.059	8.367
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	450	567	640	546	603	431
Service Time	6.032	4.056	3.47	4.302	3.759	6.367
HCM Lane V/C Ratio	0.189	0.048	1.494	0.081	1.177	0.081
HCM Control Delay	12.6	9.4	241	9.8	90.8	12
HCM Lane LOS	B	A	F	A	F	B
HCM 95th-tile Q	0.6	0.1	45.1	0.2	19.9	0.2

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Lane Configurations				
Traffic Vol, veh/h	0	16	5	8
Future Vol, veh/h	0	16	5	8
Peak Hour Factor	0.92	0.84	0.84	0.84
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	19	6	10
Number of Lanes	0	0	1	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	1
Conflicting Approach Left	WB
Conflicting Lanes Left	2
Conflicting Approach Right	EB
Conflicting Lanes Right	2
HCM Control Delay	12
HCM LOS	B

Appendix D UCI MCTM TRIP RATES

UCI MAIN CAMPUS TRAFFIC MODEL LRDP UPDATE 2007 TRIP RATE SUMMARY

	USE	UNIT	RATE A	RATE B	RATE A	RATE B
1.	Student	PER	0.50	1.90	Prop. commuter students	Person trips/comm.
2.	Faculty	PER	0.85	1.90	Proportion of commuters	Person trips/comm.
3.	UCI Staff	PER	0.84	1.90	Proportion of commuters	Person trips/comm.
4.	General Parking	SPC	1.80	0.00	Space utilization	-
5.	Resident Parking	SPC	0.00	0.00	-	-
6.	Pref/Rsvd Parking	SPC	1.50	0.00	Space utilization	-
7.	Meter Parking	SPC	8.00	0.00	Space utilization	-
8.	Other/Service Parking	SPC	0.00	0.00	-	-
9.	Support	TSF	10.00	2.00	Ext. veh. trips	Int. Ac. V. trips
10.	Single Undergrad Housing	BED	1.60	0.10	Non-Ac. veh. trips	Int. Ac. V. trips
11.	Married/Graduate Housing	BED	1.90	0.10	Non-Ac. veh. trips	Int. Ac. V. trips
12.	Faculty/Staff Studio Apt	DU	4.70	0.30	Non-Ac. veh. trips	Int. Ac. V. trips
13.	Faculty/Staff 1-Bdrm Apt	DU	4.70	0.30	Non-Ac. veh. trips	Int. Ac. V. trips
14.	Faculty/Staff 2-Bdrm Apt	DU	7.00	0.50	Non-Ac. veh. trips	Int. Ac. V. trips
15.	Faculty/Staff 3-Bdrm Apt	DU	8.40	0.60	Non-Ac. veh. trips	Int. Ac. V. trips
16.	Faculty/Staff (SFD)	DU	9.40	0.60	Non-Ac. veh. trips	Int. Ac. V. trips
17.	Faculty/Staff (SFA)	DU	8.00	0.50	Non-Ac. veh. trips	Int. Ac. V. trips
18.	UCI R&D	TSF	8.50	1.50	Ext. veh. trips	Int. veh. trips
19.	Medical Clinic	TSF	33.00	3.00	Ext. veh. trips	Int. veh. trips
20.	Fitness Center	TSF	15.00	5.00	Ext. veh. trips	Int. veh. trips
21.	Elementary School	STU	0.50	0.20	Ext. veh. trips	Int. veh. trips
22.	TIC R&D	TSF	10.00	0.50	Ext. veh. trips	Int. veh. trips
23.	Multi-Family Residential	DU	8.00	0.50	Non-Ac. veh. trips	Int. Ac. V. trips
24.	Barclay Theater	SG	20.00	0.00	Ext. veh. trips	-
25.	Bren Events Center	SG	10.00	2.00	Ext. veh. trips	Int. veh. trips
26.	Evening Classes	STU	1.00	2.00	Pop. commuter students	Person trips/comm.

LU data code specifications -

ACADEMIC	1 26	Students
	2 3	Faculty/Staff
PARKING	4 7	Students
	6	Faculty/Staff
RESIDENTIAL	10 11	Students
	12 13 14 15 16 17 23	Faculty/Staff
SUPPORT/R&D	9 18 19 21 22 24	Support/R&D
	20 25	Commercial

Zone Specifications -

Zones 1 to 26 ACADEMIC

Zones 27 to 48 PARKING

Zones 49 to 66 RESIDENTIAL

Zones 67 to 88 SUPPORT/R&D

Zones 89 to 106 CORDONS

1.200 Student vehicle occupancy

1.100 Faculty/Staff vehicle occupancy

.200 Staff use of general parking lot spaces

APPENDIX D

CEQA Notices

UCI University of California, Irvine

Environmental Planning & Sustainability
4199 Campus Drive, Suite 380
Irvine, CA 92697-2325

(949) 824-6316
www.eps.uci.edu

NOTICE OF INTENT TO ADOPT A MITIGATED NEGATIVE DECLARATION

Project Title: Interdisciplinary Science and Engineering Building
Project Location: University of California, Irvine
Lead Agency: University of California
County: Orange

In accordance with the California Environmental Quality Act (CEQA) Guidelines and University of California Guidelines for Implementation of CEQA, an Initial Study for the Interdisciplinary Science and Engineering Building project (proposed project) was prepared by the University of California, Irvine (UCI), and was determined that a Mitigated Negative Declaration is the appropriate level of analysis.

The proposed project would demolish an existing surface parking lot, 12B, and construct an up to 200,000-gross-square-foot (GSF) structure on a 3.5-acre site located in the Physical Sciences Quad of the Academic Core on the UCI campus. The structure would be eight stories with an additional mechanical penthouse and basement level and would include wet laboratory, office, classroom/auditorium, and support space. Site improvements include paving and landscaping of the Physical Sciences pedestrian mall, along the edge of the project site, and between the project building and Physical Sciences Classroom Building and Physical Sciences Lecture Hall. The existing service road located to the east of the project site would be realigned and widened.

The project has been analyzed in the Draft Initial Study/Mitigated Negative Declaration (Draft IS/MND) and determined that, with the incorporation of mitigation, it will not have a significant effect on the environment. The document is available for viewing on the UCI website at: http://www.eps.uci.edu/EnvironmentalPlanning/index.html. Hard copies of the Draft IS/MND and referenced documents are available for review during business hours at the University of California, Irvine's Office of Environmental Planning and Sustainability. Comments will be received July 24, 2017 through August 22, 2017, and can be emailed to hashimol@uci.edu or mailed to:

Lindsey Hashimoto, Senior Planner
Office of Environmental Planning and Sustainability
University of California, Irvine
4199 Campus Drive, Suite 380
Irvine, CA 92697

The Draft IS/MND, along with comments received during the public review period, will be considered by the Regents in conjunction with project approval. If adopted by the University, the Draft IS/MND will be finalized.

Richard Demerjian, Assistant Vice Chancellor

AFFIDAVIT OF PUBLICATION

STATE OF CALIFORNIA,)
) ss.
County of Orange)

I am a citizen of the United States and a resident of the County aforesaid; I am over the age of eighteen years, and not a party to or interested in the above entitled matter. I am the principal clerk of **The Orange County Register**, a newspaper of general circulation, published in the city of Santa Ana, County of Orange, and which newspaper has been adjudged to be a newspaper of general circulation by the Superior Court of the County of Orange, State of California, under the date of November 19, 1905, Case No. A-21046, that the notice, of which the annexed is a true printed copy, has been published in each regular and entire issue of said newspaper and not in any supplement thereof on the following dates, to wit:

July 24, 2017

"I certify (or declare) under the penalty of perjury under the laws of the State of California that the foregoing is true and correct":

Executed at Santa Ana, Orange County, California, on

Date: July 24, 2017

Signature

The Orange County Register
625 N. Grand Ave.
Santa Ana, CA 92701
(714) 796-2209

PROOF OF PUBLICATION

NOTICE OF INTENT
TO ADOPT A MITIGATED NEGATIVE DECLARATION
INTERDISCIPLINARY SCIENCE AND ENGINEERING BUILDING
UNIVERSITY OF CALIFORNIA, IRVINE

In accordance with the California Environmental Quality Act (CEQA) Guidelines and University of California Guidelines for Implementation of CEQA, an Initial Study for the Interdisciplinary Science and Engineering Building project (proposed project) was prepared by the University of California, Irvine (UCI), and was determined that a Mitigated Negative Declaration is the appropriate level of analysis.

The proposed project would demolish an existing surface parking lot, 12B, and construct an up to 200,000-gross-square-foot (GSF) structure on a 3.5-acre site located in the Physical Sciences Quad of the Academic Core on the UCI campus. The structure would be eight stories with an additional mechanical penthouse and basement level and would include wet laboratory, office, classroom/auditorium, and support space. Site improvements include paving and landscaping of the Physical Sciences pedestrian mall) along the edge of the project site, and between the project building and Physical Sciences Classroom Building and Physical Sciences Lecture Hall. The existing service road located to the east of the project site would be realigned and widened.

The project has been analyzed in the Draft Initial Study/Mitigated Negative Declaration (Draft IS/MND) and determined that, with the incorporation of mitigation, it will not have a significant effect on the environment. The document is available at: http://www.eps.uci.edu/EnvironmentalPlanning/index.html. The 30-day public review period will begin July 24, 2017 through August 22, 2017. Comments may be sent to Lindsey Hashimoto, Senior Planner, at hashimol@uci.edu or mailed to University of California, Irvine, Office of Environmental Planning and Sustainability, 4199 Campus Drive, Suite 380, Irvine, CA 92697. If you have any questions regarding the project, please call (949) 824-8692.

Published: Orange County Register July 24, 2017 R-2154 10984293

Print Form

Appendix C

Notice of Completion & Environmental Document Transmittal

Mail to: State Clearinghouse, P.O. Box 3044, Sacramento, CA 95812-3044 (916) 445-0613
For Hand Delivery/Street Address: 1400 Tenth Street, Sacramento, CA 95814

SCH #

Project Title: Interdisciplinary Science and Engineering Building

Lead Agency: University of California, Irvine — Contact Person: Richard Demerjian
Mailing Address: 4199 Campus Drive, Suite 380, Irvine, CA 92697 — Phone: (949) 824-7058
City: Irvine — Zip: 92697 — County: Orange

Project Location: County: Orange — City/Nearest Community: Irvine
Cross Streets: East Peltason Drive and South Circle View Drive — Zip Code: 92697
Longitude/Latitude (degrees, minutes and seconds): 33 ° 38 ′ 33.9 ″ N / -117 ° 50 ′ 38.4 ″ W Total Acres: 3.5
Assessor's Parcel No.: ____ Section: ____ Twp.: ____ Range: ____ Base: ____
Within 2 Miles: State Hwy #: SR-73 and I-405 — Waterways: San Diego Creek
Airports: ____ Railways: ____ Schools: IUSD (4); Tarbut V'Torah

Document Type:

CEQA: ☐ NOP ☐ Early Cons ☐ Neg Dec ☒ Mit Neg Dec ☐ Draft EIR ☐ Supplement/Subsequent EIR (Prior SCH No.) ____ Other: ____
NEPA: ☐ NOI ☐ EA ☐ Draft EIS ☐ FONSI
Other: ☐ Joint Document ☐ Final Document ☐ Other: ____

Local Action Type:

☐ General Plan Update ☐ General Plan Amendment ☐ General Plan Element ☐ Community Plan
☐ Specific Plan ☐ Master Plan ☐ Planned Unit Development ☐ Site Plan
☐ Rezone ☐ Prezone ☐ Use Permit ☐ Land Division (Subdivision, etc.)
☐ Annexation ☐ Redevelopment ☐ Coastal Permit ☒ Other: Design Approval

Development Type:

☐ Residential: Units ____ Acres ____
☐ Office: Sq.ft. ____ Acres ____ Employees ____
☐ Commercial: Sq.ft. ____ Acres ____ Employees ____
☐ Industrial: Sq.ft. ____ Acres ____ Employees ____
☒ Educational: laboratory, classroom, office, and support space
☐ Recreational: ____
☐ Water Facilities: Type ____ MGD ____
☐ Transportation: Type ____
☐ Mining: Mineral ____
☐ Power: Type ____ MW ____
☐ Waste Treatment: Type ____ MGD ____
☐ Hazardous Waste: Type ____
☐ Other: ____

Project Issues Discussed in Document:

☒ Aesthetic/Visual
☐ Agricultural Land
☒ Air Quality
☒ Archeological/Historical
☒ Biological Resources
☐ Coastal Zone
☒ Drainage/Absorption
☐ Economic/Jobs
☐ Fiscal
☒ Flood Plain/Flooding
☒ Forest Land/Fire Hazard
☒ Geologic/Seismic
☐ Minerals
☒ Noise
☒ Population/Housing Balance
☒ Public Services/Facilities
☒ Recreation/Parks
☒ Schools/Universities
☒ Septic Systems
☒ Sewer Capacity
☒ Soil Erosion/Compaction/Grading
☒ Solid Waste
☒ Toxic/Hazardous
☒ Traffic/Circulation
☒ Vegetation
☒ Water Quality
☒ Water Supply/Groundwater
☒ Wetland/Riparian
☒ Growth Inducement
☒ Land Use
☒ Cumulative Effects
☒ Other: Greenhouse Gas

Present Land Use/Zoning/General Plan Designation:
UC Irvine is not subject to local zoning regulations. Permitted uses in the 2007 UCI LRDP allow academic facilities.

Project Description: *(please use a separate page if necessary)*
The proposed project would demolish an existing surface parking lot, 12B, and construct an up to 200,000-gross-square-foot (GSF) structure on a 3.5-acre site located in the Physical Sciences Quad of the Academic Core on the UCI campus. The structure would be eight stories with an additional mechanical penthouse and basement level and would include wet laboratory, office, classroom/auditorium, and support space. Site improvements include paving and landscaping of the Physical Sciences pedestrian mall, along the edge of the project site, and between the project building and Physical Sciences Classroom Building and Physical Sciences Lecture Hall. The existing service road located to the east of the project site would be realigned and widened.

Note: The State Clearinghouse will assign identification numbers for all new projects. If a SCH number already exists for a project (e.g. Notice of Preparation or previous draft document) please fill in.

Revised 2010

Reviewing Agencies Checklist

Lead Agencies may recommend State Clearinghouse distribution by marking agencies below with and "X".
If you have already sent your document to the agency please denote that with an "S".

- ____ Air Resources Board
- ____ Boating & Waterways, Department of
- ____ California Emergency Management Agency
- ____ California Highway Patrol
- S Caltrans District # 12
- ____ Caltrans Division of Aeronautics
- ____ Caltrans Planning
- ____ Central Valley Flood Protection Board
- ____ Coachella Valley Mtns. Conservancy
- ____ Coastal Commission
- ____ Colorado River Board
- ____ Conservation, Department of
- ____ Corrections, Department of
- ____ Delta Protection Commission
- ____ Education, Department of
- ____ Energy Commission
- S Fish & Game Region # 5
- ____ Food & Agriculture, Department of
- ____ Forestry and Fire Protection, Department of
- ____ General Services, Department of
- ____ Health Services, Department of
- ____ Housing & Community Development
- ____ Native American Heritage Commission
- ____ Office of Historic Preservation
- ____ Office of Public School Construction
- ____ Parks & Recreation, Department of
- ____ Pesticide Regulation, Department of
- ____ Public Utilities Commission
- S Regional WQCB # 8
- ____ Resources Agency
- ____ Resources Recycling and Recovery, Department of
- ____ S.F. Bay Conservation & Development Comm.
- ____ San Gabriel & Lower L.A. Rivers & Mtns. Conservancy
- ____ San Joaquin River Conservancy
- ____ Santa Monica Mtns. Conservancy
- ____ State Lands Commission
- ____ SWRCB: Clean Water Grants
- ____ SWRCB: Water Quality
- ____ SWRCB: Water Rights
- ____ Tahoe Regional Planning Agency
- X Toxic Substances Control, Department of
- S Water Resources, Department of
- ____ Other: ____
- ____ Other: ____

Local Public Review Period (to be filled in by lead agency)

Starting Date July 24, 2017 Ending Date August 22, 2017

Lead Agency (Complete if applicable):

Consulting Firm: ____
Address: ____
City/State/Zip: ____
Contact: ____
Phone: ____

Applicant: University of California, Irvine
Address: 4199 Campus Drive, Suite 380
City/State/Zip: Irvine, CA 92697-2325
Phone: (949) 824-7058

Signature of Lead Agency Representative: ____ **Date:** 7·21·17

Authority cited: Section 21083, Public Resources Code. Reference: Section 21161, Public Resources Code.

APPENDIX E

Responses to Comments

INTERDISCIPLINARY SCIENCE AND ENGINEERING IS/MND MAILING LIST	
Orange County Public Library University Park Branch 4512 Sandburg Way Irvine, CA 92612	California Department of Transportation District 12 1750 E 4th Street, #100 Santa Ana, CA 92705
City of Irvine Community Development Dept. P.O. Box 19575 Irvine, CA 92623-9575	Orange County Fire Authority P.O. Box 57115 Irvine, CA 92619-7115
County of Orange Planning & Development Services 300 N. Flower Street	Irvine Ranch Water District 15600 Sand Canyon Ave. Irvine, CA 92618
Orange County Transportation Authority 550 South Main Street Orange, CA 92868	Public Utilities Commission 320 W. 4th Street, Suite 500 Los Angeles, CA 90013
California Department of Fish & Wildlife 3883 Ruffin Road San Diego, CA 92123	Transportation Corridor Agencies 125 Pacifica Irvine, CA 92618-3304
U.S. Fish & Wildlife Service Division of Ecological Services 2177 Salk Avenue, Suite 250 Carlsbad, CA 92008	Irvine Unified School District 5050 Barranca Parkway Irvine, CA 92604-4698
Regional Water Quality Control Board - Santa Ana Region 3737 Main Street, Suite 500 Riverside, CA 92501-3348	Metropolitan Water District P.O. Box 54153 Los Angeles, CA 90054
U.S. Army Corps of Engineers Los Angeles District 911 Wilshire Boulevard Los Angeles, CA 90017	Southern California Association of Governments 818 West 7th Street, 12th Floor Los Angeles, CA 90017
CA Department of Toxic Substances Control 5796 Corporate Avenue Cypress, California 90630	Department of Water Resources 1416 9th Street Sacramento, CA 95814
South Coast Air Quality Management District 21865 East Copley Drive Diamond Bar, CA 91765-4182	

Interdisciplinary Science and Engineering Building

Draft Initial Study/Mitigated Negative Declaration
Public Review/Response to Comments

Public Review

The Draft Initial Study/Mitigated Negative Declaration (IS/MND), along with a Notice of Completion (NOC) and Notice of Intent to Adopt a Mitigated Negative Declaration (NOI), were circulated for public review and comment from July 24, 2017 through August 22, 2017. Copies of the document were submitted to the State Clearinghouse; local agencies; UCI faculty, staff, and other members of the campus community; and additional interested groups and persons. On July 24, 2017, a notice regarding the availability of the Draft IS/MND was published in the Orange County Register. Copies of the distribution list and notices are provided in this appendix.

Comments and Responses

Written comments were submitted by the agencies listed below. The letters and the responses to comments are presented on the pages following the Draft IS/MND distribution list.

Commenting Agency	Date
Orange County Fire Authority	August 9, 2017
City of Irvine	August 17, 2017
County of Orange	August 18, 2017

ORANGE COUNTY FIRE AUTHORITY
P.O. Box 57115, Irvine, CA 92619-7115 • 1 Fire Authority Road, Irvine, CA 92602
Jeff Bowman, Fire Chief **(714) 573-6000** **www.ocfa.org**

August 9, 2017

University of California
Attn: Lindsey Hashimoto, Senior Planner
Environmental Planning & Sustainability
4199 Campus Dr, Suite 380
Irvine, CA 92697-2325

Subject: Notice of Intent to Adopt a Mitigated Negative Declaration: Interdisciplinary Science and Engineering Building

To whom it may concern:

Thank you for the opportunity to review the subject document. Please see our following comments:
Page 2-9 Section 2.23 Utilities:

1. The new science and engineering building is to be constructed with fully automatic fire sprinklers and fire alarm.
2. A Fire Master Plan will be submitted to OCFA for firewater supply and fire lane access, prior to construction.

Page 4.12-2
The Orange County Fire Authority (OCFA) does not agree with the statement that this project would not require the need for a new fire protection facility. OCFA provides fire protection and emergency medical services response to the project area. Services include: structural fire protection, emergency medical and rescue services, and hazardous material response. As stated in the document, OCFA Fire Station 4 is the primary fire station serving the UCI Campus. The LRDP EIR referenced in the subject document to determine there would be no need for a new station is ten years old. Call capacity increases each year; nearly 40% of this station's calls are being generated from the UCI Campus. With the continued growth of UCI there is an increased need to evaluate additional fire stations. Due to the high demand on emergency services, OCFA and UCI have been in talks to determine if and where a new fire station could be located within the UCI area to maintain service levels.

If you have any questions, please feel free to contact me.

Sincerely,

Tamera Rivers

Tamera Rivers
Management Analyst
(714) 573-6199

Responses to the Orange County Fire Authority

Comment 1: The proposed project will comply with all applicable State and local building codes pertaining to fire and life safety, and the UC Fire Marshal will review all project plans prior to the start of construction.

Comment 2: A project-specific fire plan will be submitted to OCFA during the final plan check. In addition, consultation with OCFA regarding fire access and supply will occur during the design phase.

Comment 3: As discussed on page 4.12-1 of the Final IS/MND, Station #4 has sufficient capacity to serve the project, which references data provided by OCFA in 2017. Operation of the proposed project would not result in a significant increase in calls or response times that would require the need for the construction of new fire protection facility.

In the event that a fire protection facility is built on the campus in the future, then a project-specific environmental analysis will be completed at that time.

Community Development
cityofirvine.org
1 Civic Center Plaza, Irvine, CA 92606-5208
949-724-6000

August 17, 2017

Ms. Lindsey Hashimoto
Office of Environmental Planning and Sustainability
4199 Campus Drive, Suite 750
Irvine, CA 92612

Subject: Interdisciplinary Science and Engineering Building Initial Study and Mitigated Negative Declaration

Dear Ms. Hashimoto:

Thank you for the opportunity to review the Initial Study (IS) and Mitigated Negative Declaration (MND) for the Interdisciplinary Science and Engineering building. The new project proposes to demolish an existing surface parking lot to construct a new 200,000 +/-square foot, eight story, building in the Physical Sciences Quad of the Academic Core on the UCI campus.

Staff completed its review and has provided the enclosed comments. If you have any questions, please contact me at 949-724-6364 or by email at jequina@cityofirvine.org.

Sincerely,

Justin Equina
Associate Planner

Enclosure: Staff comments

cc: Bill Jacobs, Principal Planner

City of Irvine comments on UC Irvine Interdisciplinary Science and Engineering Building Initial Study and Mitigated Negative Declaration

1. Clarify if the new 200,000 square foot building has been accounted for in the "Growth Accommodated Over Actual" section in Table 3-2 of the 2007 LRDP.

2. Clarify if the student population will increase with the construction of this new building. It appears that there will be 70 new faculty and staff members, but the student population remains the same.

3. Based on ITE Trip Generation Manual 9th Edition, the project will generate 627 ADT, 52 AM, and 55 PM peak hour trips. Since the project will generate more than 50 AM and PM peak hour trips, the study area should be expanded to include the following street segments that provide access to the campus:

   - Culver Drive from Campus to I-405 NB & SB ramps including all the links and intersections in between.
   - University Drive from California to I-405 NB & SB ramps including all the links and intersections in between.
   - Campus Drive from Jamboree to Turtle Rock Drive including all links and intersections in between.

4. Provide a table that shows land use type and square footages, number of students, number of faculty and employees, and building type. The table should consist of the following categories:

   - 2007 LRDP approved land uses
   - 2017 (Existing/ under construction)
   - 2017 (Approved but not built yet)
   - To date (Applications/Proposals Under review but not approved yet)

   This table is needed to track the 2007 LRDP approvals and to ensure each individual project does not exceed the previously approved EIR for the 2007 LRDP.

5. Provide a table showing the 2007 LRDP mitigations and timelines. Identify which mitigation has been completed and which are pending and/or planned. Additionally, confirm whether or not this project will trigger any of the remaining 2007 LRDP improvements. If so, specify which improvements and the anticipated construction date. The traffic study does not analyze any of the locations identified in Comment #3. It is important to do an overall analysis to ensure none of these mitigations will be triggered due to cumulative impacts of these various projects.

6. Provide a Post-2035 buildout analysis of the UCI campus.

Responses to the City of Irvine

Comment 1: As of 2017, there is 3,938,384 gross square feet (GSF) built within the Academic Core, which is below the 7,094,000 GSF listed under Academic Quads in Table 3-2 of the 2007 LRDP and analyzed in the 2007 LRDP EIR. With the addition of the approximately 72,000 GSF Anteater Learning Pavilion (previously the Classroom Building project) currently under construction and the approximately 200,000 GSF proposed Interdisciplinary Science and Engineering Building, the total square footage is below the 2007 LRDP envelope (3,938,384 GSF + 72,000 GSF + 200,000 GSF = 4,210,384 GSF) as shown in response to comment 4 below.

Comment 2: No increase in student population would result directly from the construction of the proposed project, and approximately 70 new faculty and staff would be hired during operation. In addition, the campus population remains under the envelope analyzed in the 2007 LRDP EIR as shown in response to comment 4 below.

Comment 3: The project-specific Traffic Study (Appendix C of the Final IS/MND) estimates the volume of traffic to be generated by the project using trip generation rates developed specifically for the UCI campus. These rates, which are utilized by the UCI Main Campus Traffic Model (MCTM), were derived based on traffic counts and surveys specific to the campus. Those rates indicate that the project is expected to generate approximately ten trips during both the AM and PM peak hours.

The comment in the letter includes project traffic estimates derived using trip generation rates from the ITE Trip Generation Manual 9th Edition. Unlike the trip generation rates used for the Traffic Study, the ITE trip rates are based on case studies of six to seven schools. Since trip generation is affected by variables unique to each school, such as the availability of faculty and staff housing within walking and biking distance, the use of ITE trip generation averages is less reflective of the campus in comparison to the UCI-specific rates used by the MCTM.

The comment also includes a request to expand the study area to include additional roadway links and intersections within the City of Irvine. Irrespective of the trip generation rates used for analysis, based on the project trip distribution percentages shown in the Traffic Study, the project would add fewer than 50 peak hour trips to any given roadway segment or intersection. Therefore, the study area analyzed in the Traffic Study is adequate for determining the impact of the project.

Comment 4: Tables requested in the comment letter showing campus population and development by land use are shown below.

Campus Population

	2007 LRDP 2025-26	Existing 2017
Faculty/Staff	11,443	9,722
Student Enrollment	35,324	30,351

Campus Development by Land Use

Land Use	2007 LRDP 2025-26	Existing 2017	Under[1] Construction	Planned[2]
Academic & Support Space (GSF)				
Academic Quads	7,094,000	3,938,384	72,000	200,000
Health Sciences	1,461,000	910,972		214,000
Gateway/Administration	1,346,000	683,185		
North Campus	0	73,300		
Total Academic & Support Space	*9,901,000*	5,605,841		
Campus Support Services (GSF)	393,800	239,147		
Student Housing (Beds)				
Academic Core	5,027	5,458	500	
Outer Campus	12,610	8,504	1,500	
Total Student Housing Beds	*17,637*	*13,962*	*15,962*	
Faculty and Staff Housing (Dwelling Units)	1,250-1,700	1,426	300	
Income Producing Inclusion Area (GSF)	1,924,600	1,313,840		
Commercial Mixed Use				
Office/Research & Development (GSF)	950,000	0		
Multi-Family Residential (Dwelling Units)	435	0		
Neighborhood Mixed Use				
Neighborhood Commercial (GSF)	90,000	0		

1. Includes the Anteater Learning Pavilion, Middle Earth Expansion, East Campus Student Apartments Phase 4A, and University Hills Area 11.
2. Includes the Interdisciplinary Science and Engineering Building and Integrated Health Sciences Building.

Comment 5: A table outlining how UCI implements the entirety of mitigation measure Tra-1 was provided in the response to comments for the Classroom Building (now Anteater Learning Pavilion). The table is attached following these responses.

As discussed on page 4.13-54 of the 2007 LRDP EIR, all the UCITP intersections are not located within UCI's jurisdiction, and, as such, would be planned, designed, and implemented by the owning entity. A "fair share" of the improvement cost would be paid by UCI as required by mitigation measures Tra-1E and Tra-1F. Therefore, improvements listed in the UCITP are not planned because none are located within UCI jurisdiction.

As discussed in Tra-1D, monitoring is required of UCITP intersections for every 3,000-student increase above the 2007-08 enrollment level. The campus performed UCITP intersection monitoring and sent the results to the City during the response to comments for the East Campus Student Apartments Phase 4 project, which are duplicated below. All UCITP intersections are operating at an acceptable LOS D or higher and no improvements are needed at this time. As discussed on page 4.14-3 of the Final IS/MND and within the Traffic Study included as Appendix C, the proposed project would add a negligible amount of traffic to any given intersection and, therefore, it can be concluded that impacts to UCITP intersections would be less than significant.

UCITP Intersections Existing Conditions (February 2017)

Intersection	AM Peak Hour		PM Peak Hour	
	ICU	**LOS**	**ICU**	**LOS**
Von Karman Ave & Campus Dr	0.61	B	0.69	B
Jamboree Rd & Campus Dr	0.64	B	0.65	B
Jamboree Rd & Birch St	0.59	A	0.55	A
Jamboree Rd & MacArthur Blvd	0.62	B	0.68	B
Carlson Ave & Michelson Dr	0.49	A	0.52	A
Carlson Ave & Campus Dr	0.45	A	0.60	A
Harvard Ave & Michelson Dr	0.73	C	0.88	D
University Dr & Campus Dr	0.81	D	0.75	C
University Dr & California	0.72	C	0.65	B
Culver Dr & Michelson Dr	0.65	B	0.76	C
Culver Dr & University Dr	0.73	C	0.78	C
Bonita Cyn. Rd & Newport Coast Dr	0.48	A	0.54	A

Comment 6: The campus does not have buildout analysis for post-2035 at this time. However, the 2007 LRDP has a horizon year of 2025-26 and includes a traffic analysis at buildout for post-2025. In addition, UCI performs traffic analyses for all major capital projects, which address LRDP buildout post-2025. Within the past year, traffic analyses have been conducted for the Interdisciplinary Science and Engineering Building, Bison Avenue Surface Parking Lot, East Campus Student Apartments Phase 4, and Middle Earth Expansion projects with each concluding that none of the projects would result in significant traffic impacts. In addition, all UCITP intersections as of February 2017 are operating at acceptable LOS D or higher as discussed in the response to comment 5 above.

UCI LRDP Mitigation Measure Tra-1 Monitoring

Measure	***Status & Summary of Actions***
TRA-1A: To reduce on- and off-campus vehicle trips and resulting impacts, UCI will continue to implement a range of Transportation Demand Management (TDM) strategies. Program elements will include measures to increase transit and shuttle use, encourage alternative transportation modes including bicycle transportation, implement parking polices that reduce demand, and implement other administrative mechanisms that reduce vehicle trips to and from the campus. UCI shall monitor the performance of TDM programs through annual surveys.	Since 2007 UCI has implemented a comprehensive program of TDM measures resulting in an average vehicle ridership of 1.94 (based on 2015 survey), the highest of any employer greater than 3,000 in the Orange, LA, and Riverside County SCAQMD. UCI's annual investment in TDM measures is approximately $4.7 million. • 2015 UCI shuttle system ridership was 2.2 million passengers at a cost of $2.8 million. • "University Pass" transit program with 80% subsidy for unlimited OCTA ridership and coordination OCTA of routes • 20% Rebate on commuter Metrolink and Amtrak train passes • Incentivized Vanpool, carpool, ridesharing programs • Zipcar car sharing program with 6,000 on campus members • Bicycle program highlights include "ZotWheels" the first bike sharing system in the region, over 3,000 bike parking spaces, significant investment in bikeway infrastructure, bicycle education for campus affiliates of all bicycling levels offered quarterly, and major bi-annual bike education festivals to encourage safe and legal riding.
TRA-1B: UCI will continue to pursue the implementation of affordable on-campus housing to reduce peak-hour commuter trips to the campus.	UCI has implemented 2,910 beds of on-campus student housing (Fall 2016 occupancy) since 2007 with an investment of approximately $354 million. Approximately 47% of UCI students live on-campus. Planning is underway for an additional 2,200 student beds for Fall 2019 occupancy. UCI has constructed or approved 708 affordable on-campus faculty and staff homes at a cost of $275 million since 2007. Approximately 2/3rds of UCI faculty live on campus.
TRA-1C: To enhance transit systems serving the campus and local community, UCI will work cooperatively with the City of Irvine, City of Newport Beach, OCTA and other local agencies to coordinate service and routes of the UCI Shuttle with existing and proposed shuttle and transit programs including the proposed Jamboree/IBC Shuttle, proposed Orange County Great Park Shuttle, Irvine Spectrum Shuttle, and other community transit programs.	UCI works collaboratively with the local community to coordinate transit service including the City of Irvine transportation coordination committee to coordinate City-wide transit programs such as the UCI Shuttle, City I-Shuttle, bike programs, and other transit needs. UCI collaborates regularly with OCTA regarding bus routing, schedules, and UCI ridership.
TRA-1D: UCI will monitor campus trip generation and distribution and the performance of UCITP intersections in relationship to	UCI has reached the first 3,000-student-enrollment increase threshold and has initiated monitoring of UCITP intersections and collecting data for

enrollment growth. Monitoring will be conducted in consultation with the City of Irvine and the City of Newport Beach, and will occur at each 3,000-student increase in enrollment (measured as General Campus three-term average headcount), above the 2007-08 General Campus enrollment level. If UCI monitoring determines that LRDP traffic results in significant traffic impacts at UCITP intersections, UCI will implement measures to reduce vehicle trips contributing to the impact or provide "fair share" funding for improvements at the impacted intersections as described in Mitigation Measures Tra-1E and Tra-1F. UCI's share of funding will be determined by the percentage of UCI traffic volumes compared to the total traffic volumes at the impacted intersections.	analysis. UCI has requesting performance data from responsible jurisdictions.
TRA-1E: UCI will collect UCITP traffic fees from "for-profit" development projects on campus or other campus development as determined by the University. Fees will be provided to the City of Irvine, City of Newport Beach, or other public agencies to fund UCI's share of UCITP improvements when the improvements are implemented, as provided in mitigation measure Tra-1D.	No for-profit development has occurred on campus since 2007; therefore, no for-profit traffic fees have been collected.
TRA-1F: If the City of Irvine or City of Newport Beach implements UCITP improvements following UCI determination that LRDP traffic is causing a significant impact, and UCITP fees collected to date are insufficient to fund UCI's fair share, UCI shall identify and obtain funding for the fair share of identified improvements from an alternative source.	UCI currently holds a traffic fee balance of $2.6 million as a result of traffic fee credits from the City of Irvine, but no determination of impact has been identified to date. 2007 LRDP EIR estimated that UCI additionally generates $2 million per year in Measure M funds for off-campus transportation improvements.
TRA-1G: UCITP fees established for future "for-profit" development on UCI's North Campus shall be commensurate with the traffic fees established in the City of Irvine's IBC Transportation Fee program.	No for-profit development projects have occurred at the North Campus.
TRA-1H: UCI will assess a San Joaquin Hills Transportation Corridor fee to future "for-profit" campus development projects in accordance with the development fee program established by the Joint Powers Agreement entered into by the City of Irvine, the County of Orange, and neighbor cities to help pay for the San Joaquin Hills Transportation Corridor. Future "for-profit" campus development shall be required to pay such fees prior to construction. UCI's obligation to pay its share of the costs of the San Joaquin Hills Transportation Corridor shall be satisfied upon the forwarding of	SJHTC fees have been paid for all University Hills faculty/staff homes. No for-profit projects have occurred since adoption of the 2007 LRDP.

these fees to the Transportation Corridor Agencies or other agency designated to collect such fees.	
TRA-1I: UCI shall review individual projects proposed under the 2007 LRDP for consistency with UC Sustainable Transportation Policy and UCI Transportation Demand Management goals to ensure that bicycle and pedestrian improvements, transit stops, and other project features that promote alternative transportation are incorporated to the extent feasible.	All UCI projects undergo review for consistency with UC Sustainable Transportation Policy and UCI TDM goals.
TRA-1J: If a campus construction project or a specific campus event requires an on-campus lane or roadway closure, or could otherwise substantially interfere with campus traffic circulation, the contractor or other responsible party will provide a traffic control plan for review and approval by UCI. The traffic control plan shall ensure that adequate emergency access and egress is maintained and that traffic is allowed to move efficiently and safely in and around the campus. The traffic control plan may include measures such as signage, detours, traffic control staff, a temporary traffic signal, or other appropriate traffic controls. If the interference would occur on a public street, UCI shall apply for all applicable permits from the appropriate jurisdiction.	MM Tra-1J is implemented on all UCI projects.

August 18, 2017 NCL-17-049

Lindsey Hashimoto
Office of Environmental Planning and Sustainability
University of California, Irvine
4199 Campus Drive, Suite 380
Anaheim, CA 92803

Subject: Notice of Intent to Adopt a MND for UCI Interdisciplinary Science and Engineering Building

Dear Lindsey Hashimoto :

Thank you for the opportunity to comment on the Notice of Intent to Adopt a MND for UCI Interdisciplinary Science and Engineering Building. Flood Program Support/Hydrology Section reviewed the subject document and offers the following comments for your consideration:

1. LRDP Mitigation measure Hyd-1B that is noted in page 4.8-4, is not included in the Draft Tiered Initial Study and Mitigated Negative Declaration, nor was it found in the 2007 LRDP EIR. Please review the statement and correct it accordingly.

2. We recommend all hydrologic and hydraulic studies conform to the current guidelines and criteria as specified in the Orange County Hydrology Manual (OCHM), Addendum No. 1 to the OCHM, and the Orange County Flood Control District (OCFCD) Design Manual.

Thank you for the opportunity to review this document. If you have any questions regarding these comments, please contact Sahar Parsi at (714) 647-3988 or Robert Mclean at (714) 647-3951 in Flood Programs or Linda Smith at (714) 667-8848. in OC Development Services.

Sincerely,

Richard Vuong, Manager, Planning Division
OC Public Works Service Area/OC Development Services
300 North Flower Street
Santa Ana, California 92702-4048
Richard.Vuong@ocpw.ocgov.com

cc: Robert McLean, Flood Programs
Sahar Parsi, Flood Programs

Response to the County of Orange

Comment 1: Text has been corrected from Hyd-1B to Hyd-2B on page 4.8-4 of the Final IS/MND.

Comment 2: As a design-build project, hydrologic and hydraulic analyses will be completed during the design phase. The recommendation has been noted and the project manager has been informed.

APPENDIX F

Mitigation Monitoring and Reporting Program

	Mitigation Measure	Responsible Party	Monitoring and Reporting Procedure
Aes-2A	Prior to project design approval for future projects that implement the 2007 LRDP, UCI shall ensure that the projects include design features to minimize glare impacts. These design features shall include use of non-reflective exterior surfaces and low-reflectance glass (e.g., double or triple glazing glass, high technology glass, low-E glass, or equivalent materials with low reflectivity) on all project surfaces that could produce glare.	D&CS/EPS	D&CS to review during design EPS to confirm
Aes-2B	Prior to approval of construction documents for future projects that implement the 2007 LRDP, UCI shall approve an exterior lighting plan for each project. In accordance with UCI's Campus Standards and Design Criteria for outdoor lighting, the plan shall include, but not be limited to, the following design features: • Full-cutoff lighting fixtures to direct lighting to the specific location intended for illumination (e.g., roads, walkways, or recreation fields) and to minimize stray light spillover into adjacent residential areas, sensitive biological habitat, and other light-sensitive receptors; • Appropriate intensity of lighting to provide campus safety and security while minimizing light pollution and energy consumption; and • Shielding direct lighting within parking areas, parking structures, or roadways away from adjacent residential areas, sensitive biological habitat, and other light-sensitive receptors through site configuration, grading, lighting design, or barriers such as earthen berms, walls, or landscaping.	D&CS/EPS	D&CS to review during design EPS to confirm
AQ-1	AQ-1: Prior to initiating construction, UCI shall ensure that the project construction contract includes a construction emissions mitigation plan, including measures compliant with SCAQMD Rule 403 (Fugitive Dust), to be	D&CS/EPS	D&CS to confirm and monitor contractor

	Mitigation Measure	Responsible Party	Monitoring and Reporting Procedure
	implemented and supervised by the on-site construction supervisor, which shall include, but not be limited to, the following BMPs: • During grading and site preparation activities, exposed soil areas shall be stabilized via frequent watering, non-toxic chemical stabilization, or equivalent measures at a rate to be determined by the on-site construction supervisor. • During windy days when fugitive dust can be observed leaving the construction site, additional applications of water shall be required at a rate to be determined by the onsite construction supervisor. • Disturbed areas designated for landscaping shall be prepared as soon as possible after completion of construction activities. • Areas of the construction site that will remain inactive for three months or longer following clearing, grubbing and/or grading shall receive appropriate BMP treatments (e.g., revegetation, mulching, covering with tarps, etc.) to prevent fugitive dust generation. • All exposed soil or material stockpiles that will not be used within 3 days shall be enclosed, covered, or watered twice daily, or shall be stabilized with approved nontoxic chemical soil binders at a rate to be determined by the on-site construction supervisor. • Unpaved access roads shall be stabilized via frequent watering, non-toxic chemical stabilization, temporary paving, or equivalent measures at a rate to be determined by the on-site construction supervisor. • Trucks transporting materials to and from the site shall allow for at least two feet of freeboard (i.e., minimum vertical distance between the top of the load and the top of the trailer). Alternatively, trucks		EPS to confirm

	Mitigation Measure	Responsible Party	Monitoring and Reporting Procedure
	transporting materials shall be covered. • Speed limit signs at 15 mph or less shall be installed on all unpaved roads within construction sites. • Where visible soil material is tracked onto adjacent public paved roads, the paved roads shall be swept and debris shall be returned to the construction site or transported off site for disposal. • Wheel washers, dirt knock-off grates/mats, or equivalent measures shall be installed within the construction site where vehicles exit unpaved roads onto paved roads. • Diesel powered construction equipment shall be maintained in accordance with manufacturer's requirements, and shall be retrofitted with diesel particulate filters where available and practicable. • Heavy duty diesel trucks and gasoline powered equipment shall be turned off if idling is anticipated to last for more than 5 minutes. • Where feasible, the construction contractor shall use alternatively fueled construction equipment, such as electric or natural gas-powered equipment or biofuel. • Heavy construction equipment shall use low NOx diesel fuel to the extent that it is readily available at the time of construction. • To the extent feasible, construction activities shall rely on the campus's existing electricity infrastructure rather than electrical generators powered by internal combustion engines. • The construction contractor shall develop a construction traffic		

Mitigation Measure		Responsible Party	Monitoring and Reporting Procedure
	management plan that includes the following: • Scheduling heavy-duty truck deliveries to avoid peak traffic periods Consolidating truck deliveries. • Where possible, the construction contractor shall provide a lunch shuttle or on-site lunch service for construction workers. • The construction contractor shall, to the extent possible, use pre-coated architectural materials that do not require painting. Water-based or low VOC coatings shall be used that are compliant with SCAQMD Rule 1113. Spray equipment with high transfer efficiency, such as the high volume-low pressure spray method, or manual coatings application shall be used to reduce VOC emissions to the extent possible. • Project constructions plans and specifications will include a requirement to define and implement a work program that would limit the emissions of reactive organic gases (ROG's) during the application of architectural coatings to the extent necessary to keep total daily ROG's for each project to below 75 pounds per day, or the current SCAQMD threshold, throughout that period of construction activity to the extent feasible. The specific program may include any combination of restrictions on the types of paints and coatings, application methods, and the amount of surface area coated as determined by the contractor. • The construction contractor shall maintain signage along the construction perimeter with the name and telephone number of the individual in charge of implementing the construction emissions mitigation plan, and with the telephone number of the SCAQMD's complaint line. The contractor's representative shall maintain a log of		

	Mitigation Measure	Responsible Party	Monitoring and Reporting Procedure
	any public complaints and corrective actions taken to resolve complaints.		
BR-1	In order to avoid impacts to nesting birds, project activities shall occur outside of the peak avian breeding season, which runs from February 1st through August 31st. If project construction is necessary during the bird breeding season, a qualified biologist with experience in conducting bird breeding surveys shall conduct surveys for nesting birds, within three days prior to the work in the area, and ensure no nesting birds in the project area would be impacted by the project. If an active nest is identified, a buffer shall be established between the construction activities and the nest so that nesting activities are not interrupted. The buffer shall be a minimum width of 300 feet (500 feet for raptors), be delineated by temporary fencing, and remain in effect as long as construction is occurring or until the nest is no longer active. Reductions in the nest buffer distance may be appropriate depending on the avian species involved, ambient levels of human activity, screening vegetation, or other possible factors.	D&CS/EPS	D&CS to coordinate surveys and incorporate into construction documents EPS to confirm
Cul-1C	Prior to land clearing, grading, or similar land development activities for future projects that implement the 2007 LRDP in areas of identified archaeological sensitivity, UCI shall retain a qualified archaeologist (and, if necessary, a culturally affiliated Native American) to monitor these activities. In the event of an unexpected archaeological discovery during grading, the on-site construction supervisor shall redirect work away from the location of the archaeological find. A qualified archaeologist shall oversee the evaluation and recovery of archaeological resources, in accordance with the procedures listed below, after which the on-site construction supervisor shall be notified and shall direct work to continue in the location of the archaeological find. A record of monitoring activity shall be submitted to UCI each month and at the end of monitoring. If an archaeological discovery is determined to be significant, the archaeologist shall prepare and implement a data recovery plan. The plan shall	D&CS/EPS	On-site construction supervisor to notify D&CS and EPS who will stop/direct work Submit final report to EPS

	Mitigation Measure	Responsible Party	Monitoring and Reporting Procedure
	include, but not be limited to, the following measures: a. Perform appropriate technical analyses; b. File an resulting reports with South Coast Information Center; and c. Provide the recovered materials to an appropriate repository for curation, in consultation with a culturally-affiliated Native American.		
Cul-4A	Prior to grading or excavation for future project that implement the 2007 LRDP and would excavate sedimentary rock material other than topsoil, UCI shall retain a qualified paleontology to monitor these activities. In the event fossils are discovered during grading, the on-site construction supervisor shall be notified and shall redirect work away from the location of the discovery. The recommendations of the paleontologist shall be implemented with respect to the evaluation and recovery of fossils, in accordance with mitigation measures Cul-4B and Cul-4C, after which the on-site construction supervisor shall be notified and shall direct work to continue in the location of the fossil discovery. A record of monitoring activity shall be submitted to UCI each month and ay the end of monitoring.	D&CS/EPS	On-site construction supervisor to notify D&CS and EPS who will stop/direct work Submit final report to EPS
Cul-4B	If the fossils are determined to be significant, then mitigation measure Cul-4C shall be implemented.	D&CS/EPS	Submit documentation to EPS to report procedures were followed
Cul-4C	For significant fossils as determined by mitigation measure Cul-4B, the paleontologist shall prepare and implement a data recovery plan. The plan shall include, but not be limited to, the following measures: a. The paleontologist shall ensure that all significant fossils collected are cleaned, identified, catalogued, and permanently curated with an appropriate institution with a research interest in the materials (which	D&CS/EPS	Submit documentation to EPS to report procedures were followed and an attempt to house found fossils occurred

Mitigation Measure		Responsible Party	Monitoring and Reporting Procedure
	may include UCI); b. The paleontologist shall ensure that specialty studies are completed, as appropriate, for any significant fossil collected; and c. The paleontologist shall ensure that curation of fossils are completed in consultation with UCI. A letter of acceptance from the curation institution shall be submitted to UCI.		
Haz-6A	Prior to initiating on-site construction for future projects that implement the 2007 LRDP and would involve a land or roadway closure, the construction contractor and/or UCI Design and Construction Services shall notify the UCI Fire Marshal. If determined necessary by the UCI Fire Marshal, local emergency services shall be notified of the lane or roadway closure by the Fire Marshal.	D&CS/EPS	D&CS to record notification to the Fire Marshall EPS to confirm
Hyd-1A	As early as possible in the planning process of future projects that implement the 2007 LRDP and would result in land disturbance of 1 acre or greater, and for all development projects occurring on the North Campus in the watershed of the San Joaquin Freshwater Marsh, a qualified engineer shall complete a drainage study. Design features and other recommendations from the drainage study shall be incorporated into project development plans and construction documents. Design features shall be consistent with UCI's Storm Water Management Program, shall be operational at the time of project occupancy, and shall be maintained by UCI. At a minimum, all drainage studies required by this mitigation measure shall include, but not be limited to, the following design features: Site design that controls runoff discharge volumes and durations shall be utilized, where applicable and feasible, to maintain or reduce the peak runoff for the 10-year, 6-hour storm event in the post-development condition compared to the pre-development condition, or as defined by current water	D&CS/EPS	D&CS to incorporate findings into project design EPS to confirm

	Mitigation Measure	Responsible Party	Monitoring and Reporting Procedure
	quality regulatory requirements. Measures that control runoff discharge volumes and durations shall be utilized, where applicable and feasible, on manufactured slopes and newly-graded drainage channels, such as energy dissipaters, revegetation (e.g., hydroseeding and/or plantings), and slope/channel stabilizers.		
Hyd-2A	Prior to initiating on-site construction for future projects that implement the 2007 LRDP, UCI shall approve an erosion control plan for project construction. The plan shall include, but not be limited to, the following applicable measures to protect downstream areas from sediment and other pollutants during site grading and construction: • Proper storage, use, and disposal of construction materials. • Removal of sediment from surface runoff before it leaves the site through the use of silt fences, gravel bags, fiber rolls or other similar measures around the site perimeter. • Protection of storm drain inlets on-site or downstream of the construction site through the use of gravel bags, fiber rolls, filtration inserts, or other similar measures. • Stabilization of cleared or graded slopes through the use of plastic sheeting, geotextile fabric, jute matting, tackifiers, hydro-mulching, revegetation (e.g., hydroseeding and/or plantings), or other similar measures. • Protection or stabilization of stockpiled soils through the use of tarping, plastic sheeting, tackifiers, or other similar measures. • Prevention of sediment tracked or otherwise transported onto adjacent roadways through use of gravel strips or wash facilities at exit areas (or	D&CS/EPS	D&CS to prepare erosion control plan and incorporate into construction documents EPS to confirm

Mitigation Measure		Responsible Party	Monitoring and Reporting Procedure
	equivalent measures). • Removal of sediment tracked or otherwise transported onto adjacent roadways through periodic street sweeping. • Maintenance of the above-listed sediment control, storm drain inlet protection, slope/stockpile stabilization measures.		
Hyd-2B	Prior to project design approval for future projects that implement the 2007 LRDP and would result in land disturbance of 1 acre or more, the UCI shall ensure that the projects include the design features listed below, or their equivalent, in addition to those listed in mitigation measure Hyd-1A. Equivalent design features may be applied consistent with applicable MS4 permits (UCI's Storm Water Management Plan) at that time. All applicable design features shall be incorporated into project development plans and construction documents; shall be operational at the time of project occupancy; and shall be maintained by UCI. • All new storm drain inlets and catch basins within the project site shall be marked with prohibitive language and/or graphical icons to discourage illegal dumping per UCI standards. • Outdoor areas for storage of materials that may contribute pollutants to the storm water conveyance system shall be covered and protected by secondary containment. • Permanent trash container areas shall be enclosed to prevent off-site transport of trash, or drainage from open trash container areas shall be directed to the sanitary sewer system. • At least one treatment control is required for new parking areas or structures, or for any other new uses identified by UCI as having the	D&CS/EPS	D&CS to incorporate into construction documents EPS to confirm

	Mitigation Measure	Responsible Party	Monitoring and Reporting Procedure
	potential to generate substantial pollutants. Treatment controls include, but are not limited to, detention basins, infiltration basins, wet ponds or wetlands, bio-swales, filtration devices/inserts at storm drain inlets, hydrodynamic separator systems, increased use of street sweepers, pervious pavement, native California plants and vegetation to minimize water usage, and climate controlled irrigation systems to minimize overflow. Treatment controls shall incorporate volumetric or flow-based design standards to mitigate (infiltrate, filter, or treat) storm water runoff, as appropriate.		
Noi-2A	Prior to initiating on-site construction for future projects that implement the 2007 LRDP, UCI shall approve contractor specifications that include measures to reduce construction/demolition noise to the maximum extent feasible. These measures shall include, but are not limited to, the following: • Noise-generating construction activities occurring Monday through Friday shall be limited to the hours of 7:00 am to 7:00 pm, except during summer, winter, or spring break at which construction may occur at the times approved by UCI. • Noise-generating construction activities occurring on weekends in the vicinity of (can be heard from) off-campus land uses shall be limited to the hours of 9:00 am to 6:00 pm on Saturdays, with no construction occurring on Sundays or holidays. • Noise-generating construction activities occurring on weekends in the vicinity of (can be heard from) on-campus residential housing shall be limited to the hours of 9:00 amto 6:00 pm on Saturdays, with no construction on Sundays or holidays. However, as determined by UCI, if on-campus residential housing is unoccupied (during summer, winter, or spring break, for example), or would otherwise be unaffected	D&CS/EPS	D&CS to confirm with contractor and incorporate into construction documents EPS to confirm

	Mitigation Measure	Responsible Party	Monitoring and Reporting Procedure
	by construction noise, construction may occur at any time. • Construction equipment shall be properly outfitted and maintained with manufacturer recommended noise-reduction devices to minimize construction-generated noise. • Stationary construction noise sources such as generators, pumps or compressors shall be located at least 100 feet from noise-sensitive land uses (i.e., campus housing, classrooms, libraries, and clinical facilities), as feasible. • Laydown and construction vehicle staging areas shall be located at least 100 feet from noise-sensitive land uses (i.e., campus housing, classrooms, libraries, and clinical facilities), as feasible. • All neighboring land uses that would be subject to construction noise shall be informed at least two weeks prior to the start of each construction project, except in an emergency situation. • Loud construction activity such as jackhammering, concrete sawing, asphalt removal, pile driving, and large-scale grading operations occurring within 600 feet of a residence or an academic building shall not be scheduled during any finals week of classes. A finals schedule shall be provided to the construction contractor.		