CITY OF PALMDALE

General Plan Amendment (GPA) 18-003, Zone Change (ZC) 18-003, Tentative Tract Map (TTM) 82174, Tentative Tract Map (TTM) 82175, Planned Development (PD) 18-002, and Site Plan Review (SPR) 18-006

INITIAL STUDY /
MITIGATED NEGATIVE DECLARATION

Prepared for:

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Prepared by:

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February 2020

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1. INTRODUCTION

A. Purpose and Background of the Initial Study

Pursuant to Section 15063 of the *California Environmental Quality Act (CEQA) Guidelines* (Title 14, California Code of Regulations, Section 15000 et seq.), this Initial Study (IS) is a preliminary environmental analysis that was prepared by Christopher Aune and is used by the lead agency (City of Palmdale) as a basis for determining whether an Environmental Impact Report (EIR), a Negative Declaration (ND), or a Mitigated Negative Declaration (MND) is required for the project. The *State* CEQA Guidelines require that an Initial Study contain a project description of environmental setting, identification of environmental effects by checklist or other similar form, explanation of environmental effects, discussion of mitigation for significant environmental effects, evaluation of the project's consistency with existing, applicable land use controls, and the name of persons who prepared the study. Based on the analysis contained in this Initial Study, it has been determined that the proposed project would not result in any significant impacts that cannot be mitigated to less than significant levels. Therefore, preparation of a Mitigated Negative Declaration is appropriate for the project.

B. Lead Agency
City of Palmdale
Economic and Community Development Department - Planning Division
38250 Sierra Highway
Palmdale, CA 93550

C. Technical Studies

- *Acoustical Analysis 20th and Rancho Residential Development City of Palmdale* by Christopher Jean & Associates, INC., (June 28, 2019)
- *20th Street West and Rancho Vista Boulevard Project Air Quality Study and Greenhouse Gas Study* by Rincon Consultants, Inc., (March 2018)
- *Biological Resource Assessment and Native Vegetation Preservation Plan for Residential Development Palmdale, California* by Mark Hagan, (March 21, 2018)
- *Geotechnical Investigation Report For Proposed Single-Family, Multi-Family and Commercial Development Palmdale, Los Angeles County California APN 3005-005-014, 023, 024, 025* by Bruin Geotechnical Services, Inc., (November 6, 2017)
- *APN 3005-005-014, 024, 025, 023 20th Street West and Rancho Vista Blvd*

Palmdale, CA 93550 Conceptual Hydrology Study by Duke Engineering, May 20, 2019

- *Phase 1 Cultural Resource Investigation For 33 Acres At the Northeast Corner of 20th Street West and Rancho Vista Blvd. Palmdale, Los Angeles County, California* by RT Factfinder Cultural Resources, (December 2017)
- *Cage Properties 20th Street West and Rancho Vista Development Palmdale, CA 93551 Sewer Area Study* by Duke Engineering (November 20, 2019)
- *20th Street West Development Traffic Impact Study prepared for Cage Palmdale, LLC* by Integrated Engineering Group (February 2018)

2. PROJECT DESCRIPTION

A. Project Location

Approximately 33 acres located at the northeast corner of 20th Street West and Rancho Vista Boulevard in the R-1-20,000 Zone (APNs 3005-005-014, -023, -024, and -025).

B. Project Setting

The General Plan land use designation of the Proposed Project site is SFR-1 (Single Family Residential) and the property is zoned R-1-20,000 (Single-family Residential, minimum 20,000 square foot lot size; see Figure 2). Land uses surrounding the Proposed Project site include SFR-3 (Single Family Residential) to the east and south, and SFR-1 (Single Family Residential) to the west. Zoning surrounding the Proposed Project site includes R-1-7,000 (Single-family Residential, minimum 7,000 square foot lot size) to the east and south and R-1-20,000 (Single-family Residential, minimum 20,000 square foot lot size) to the west (see Figure 3). The properties to the north of the site are within Los Angeles County jurisdiction and, according to the Los Angeles Planning and Zoning for Unincorporated Los Angeles County, are zoned for Heavy Agricultural (A-2). In addition, in the event that the properties to the north of the project site are annexed into the City of Palmdale, they have been pre-zoned as A-1-2.5 (Light Agricultural, minimum lot sizes of 2.5 acres).

Single-family homes are located south of the Proposed Project site across Rancho Vista Boulevard and immediately east of the Proposed Project site (see Figure 1). A block wall separates the houses to the east from the Proposed Project site. Homes south of Rancho Vista Boulevard also have a block wall that separates the homes from the sidewalk along the street. North of the Proposed Project are fenced residential properties.

C. Project Components

The project would involve the construction of 48 single-family homes and 380 multi-family units (60 units in 20 triplex structures, and 320 units within an apartment complex), for a total of 428 units on approximately 33 acres.

The applicant has requested to amend the General Plan land use designation of the project site from SFR-1 (Single Family Residential) to MFR (Multi-family Residential, 10.1 to 16 dwelling units per acre; see Figures 2 and 4), and to change the zoning of the project site from R-1-20,000 (Single Family Residential, minimum lot size 20,000 square feet) to R-3 (Multiple Residential; see Figures 3 and 5). These changes would allow the proposed use with a Planned Development (PD), Site Plan Review (SPR) and Tentative Tract Map (TTM) request.

D. Regulatory Requirements, Permits, and Approvals

To implement the Proposed Project, the following agreements, permits and approvals are anticipated:

- General Plan Amendment
- Zone Change
- Tentative Tract Maps
- Planned Development
- Site Plan Review
- Building Permits
- Grading Permit
- Air Quality Permits
- SWPPP General Permit
- Encroachment Permit

Figure 1
Project Location

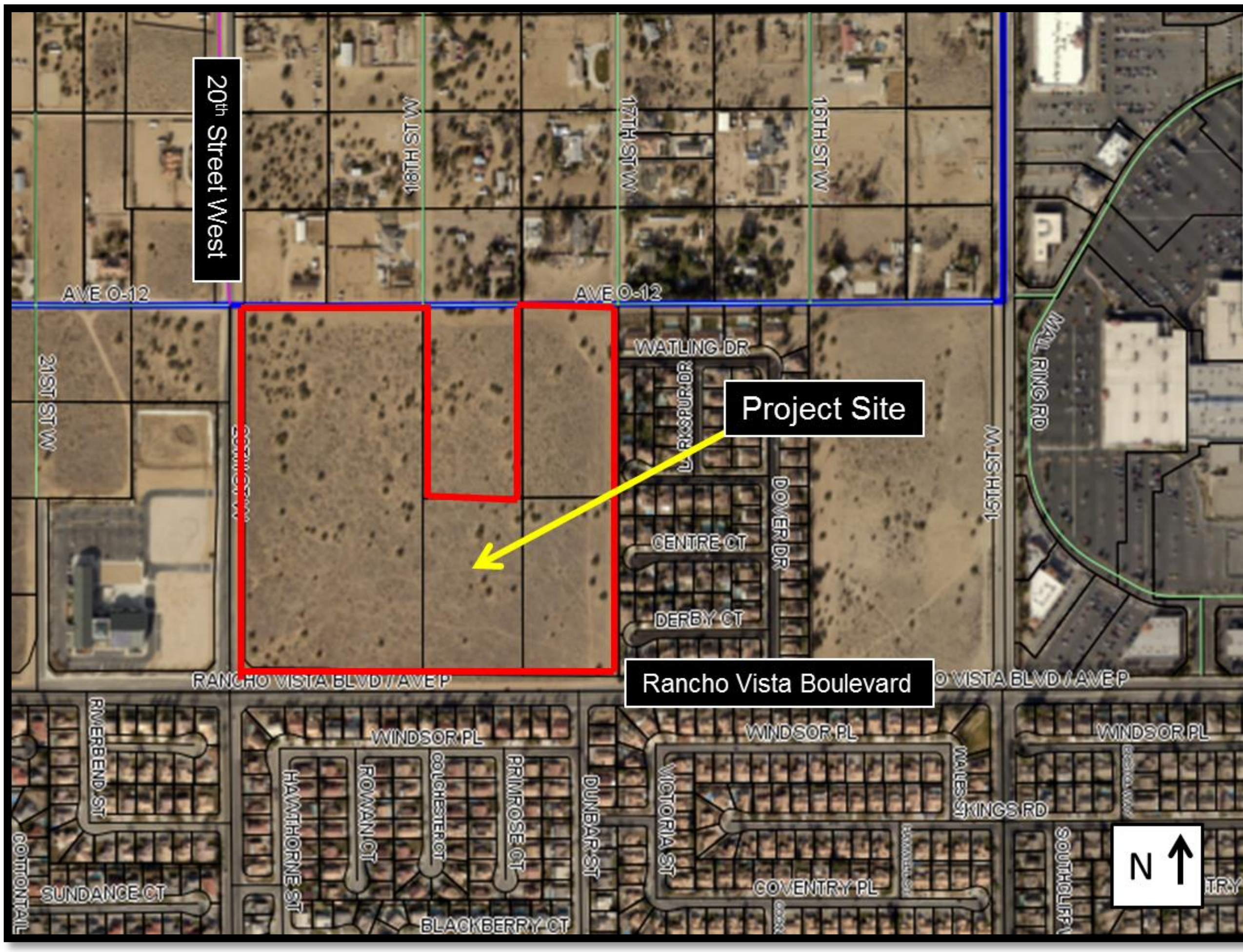


Figure 2
Existing Land Use

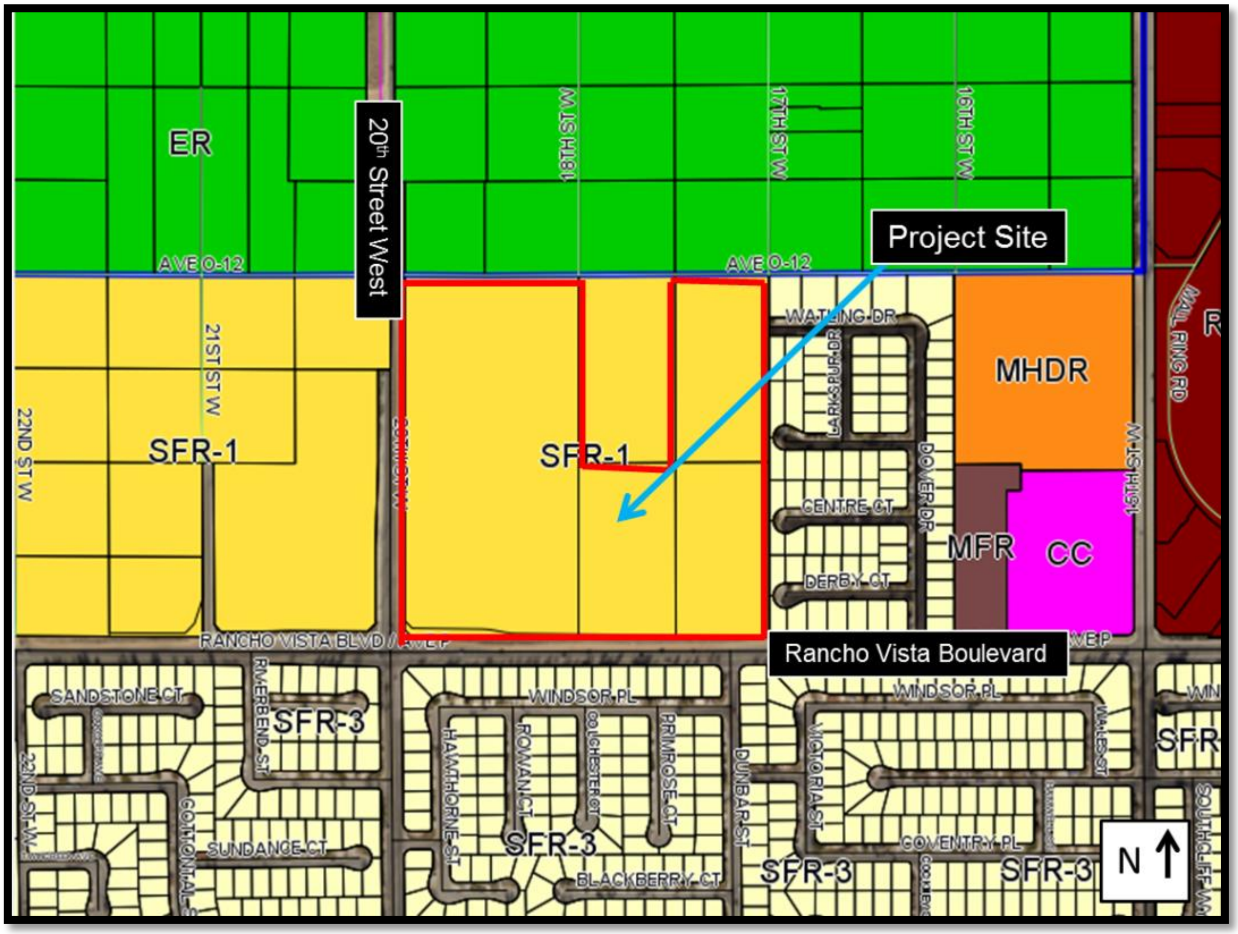


Figure 3
Existing Zoning

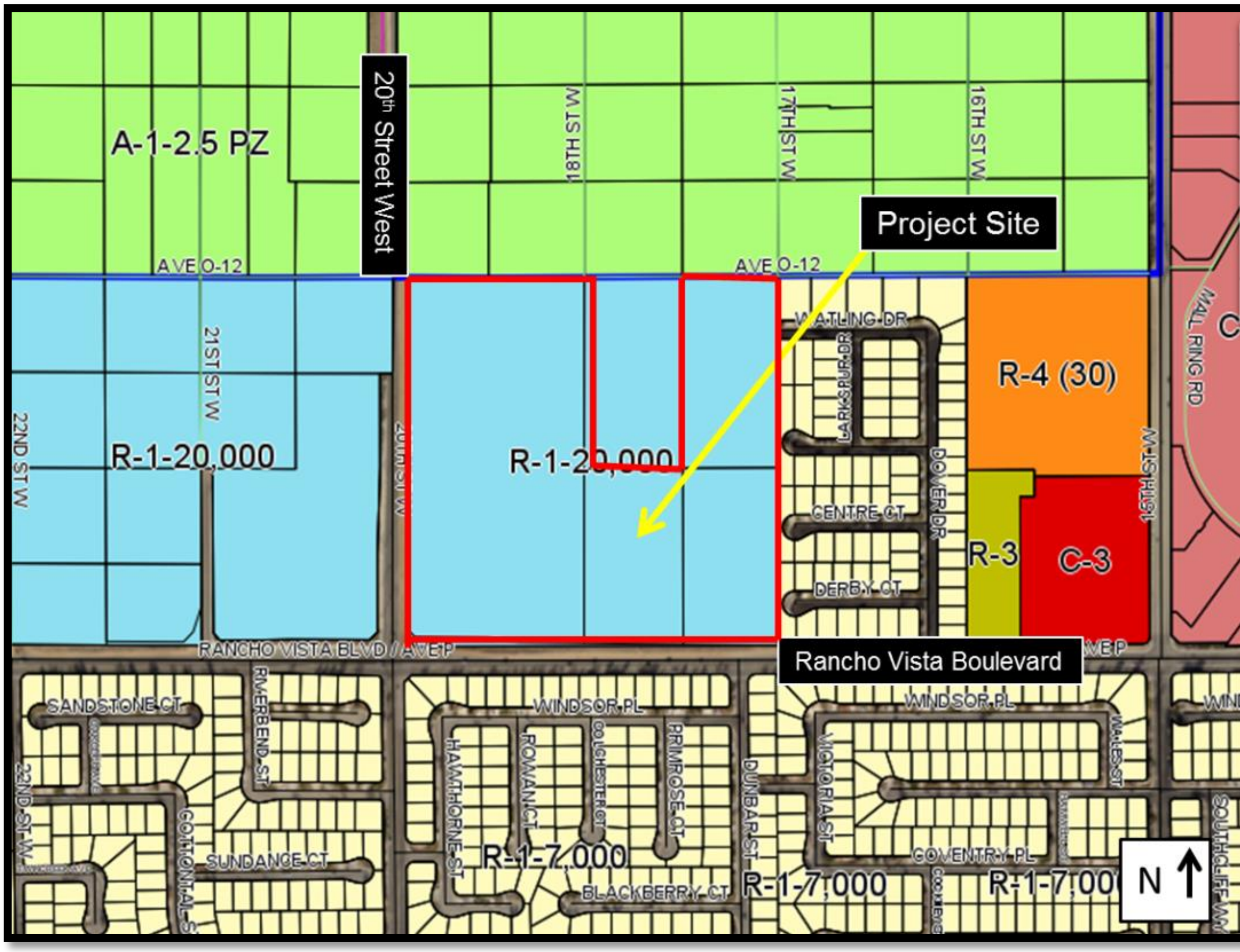


Figure 4
Proposed Land Use

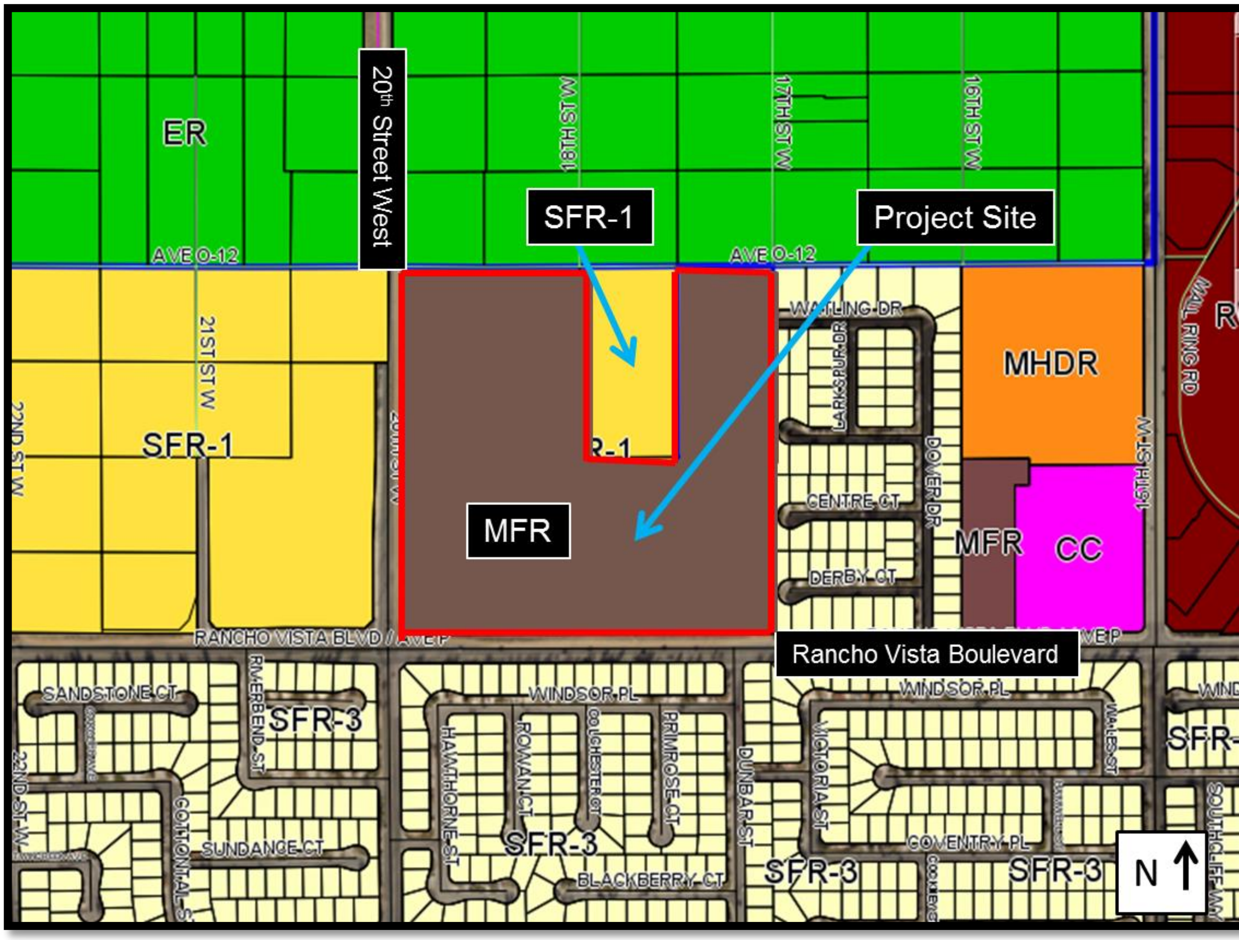


Figure 5
Proposed Zone

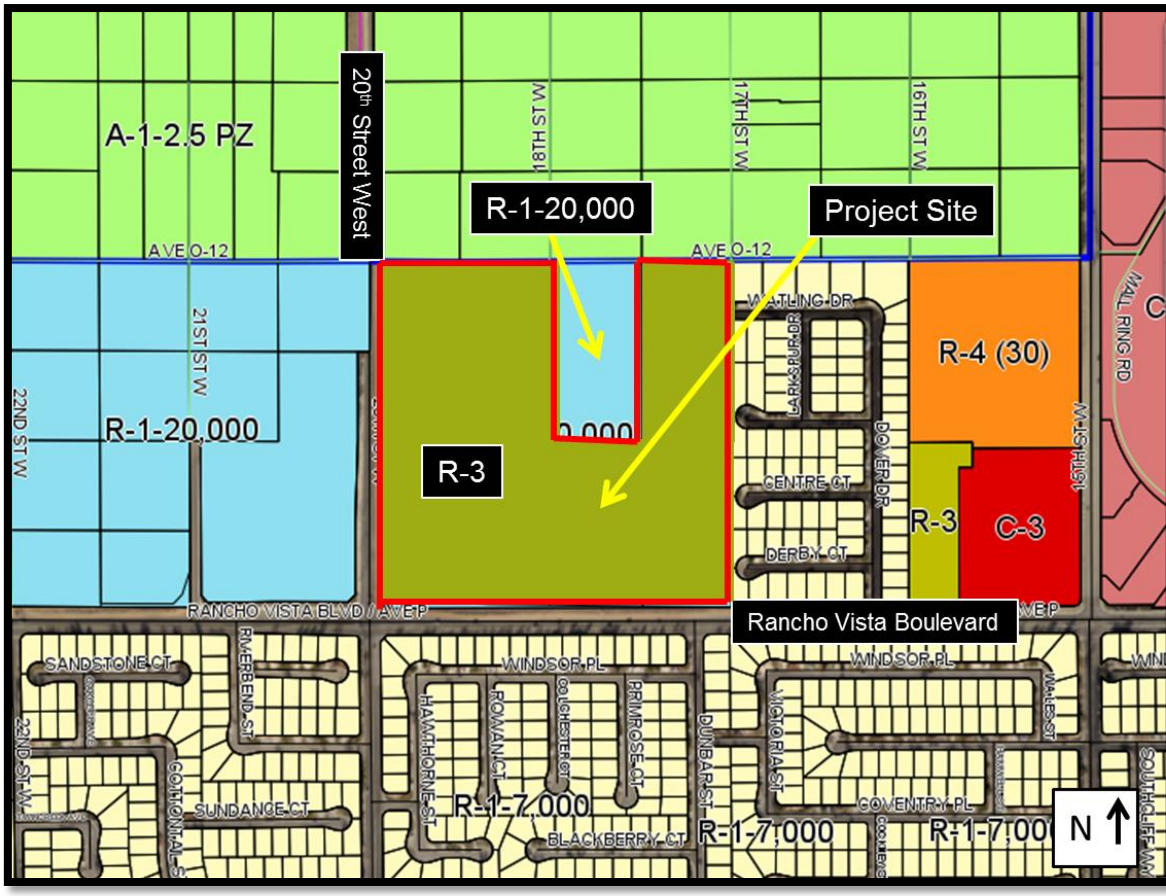
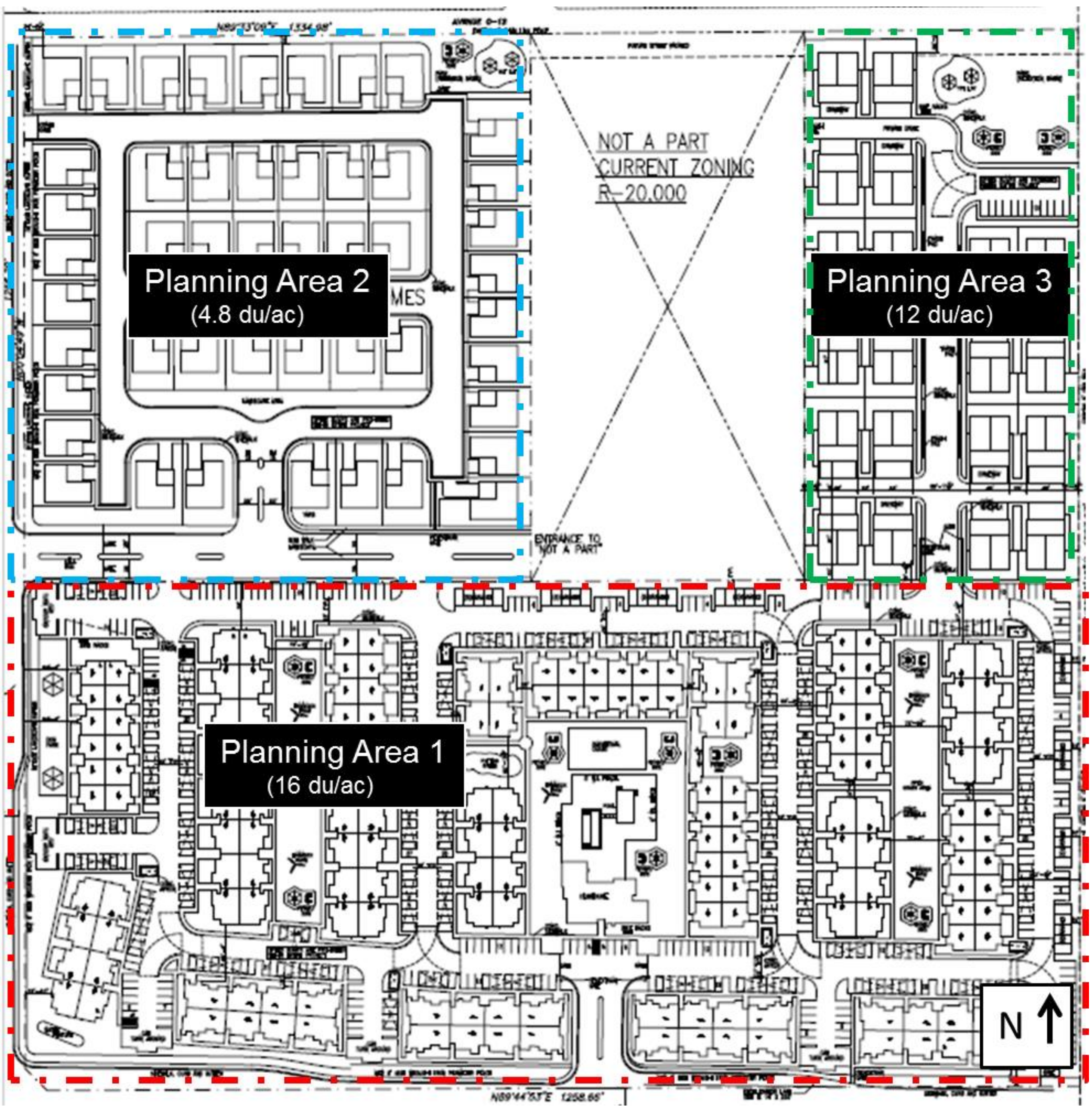


Figure 6
Conceptual Site Plan



3. ENVIRONMENTAL CHECKLIST

A. Background

1. Project Title:

General Plan Amendment 18-003, Zone Change 18-003, Tentative Tract Map 82174, Tentative Tract Map 82175, Planned Development 18-002, and Site Plan Review 18-006

2. Lead Agency Name and Address:

City of Palmdale
Economic and Community Development Department
Planning Division
38250 Sierra Highway
Palmdale, CA 93550

3. Contact Person and Phone Number:

Megan Taggart, Senior Planner
City of Palmdale
Economic and Community Development Department
Planning Division
38250 Sierra Highway
Palmdale, CA 93550
(661) 267-5200

4. Project Location:

The project site consist of 33 acres located at the northeast corner of Rancho Vista Boulevard (Avenue P) and 20th Street West (APN's 3005-005-014, 3005-005-023, 3005-005-024, and 3005-005-025)

5. Project Applicant's Name and Address:

Phillip Terry
Cage Palmdale LLC
1666 McCadden Place
Hollywood, CA 90028

6. Existing Land Use / Zoning / General Plan:

	SURROUNDING LAND USE	ZONING	GENERAL PLAN
SITE	Vacant	R-1-20,000 (single-family residential, minimum 20,000 square foot lot size)	SFR-1 (single-family residential, 0-2 dwelling units per acre)
NORTH	Single-family Residences, across Avenue O-12	Los Angeles County Jurisdiction	Los Angeles County Jurisdiction
SOUTH	Single-family Residences, across Rancho Vista Boulevard	R-1-7,000 (single-family residential, minimum 7,000 square foot lot size)	SFR-3 (single-family residential, 3.1-6 dwelling units per acre)
EAST	Single-family Residences	R-1-7,000 (single-family residential, minimum 7,000 square foot lot size)	SFR-3 (single-family residential, 3.1-6 dwelling units per acre)
WEST	Religious assembly, across 20th Street West	R-1-20,000 (single-family residential, minimum 20,000 square foot lot size)	SFR-1 (single-family residential, 0-2 dwelling units per acre)

7. Description of Project:

The Proposed Project is located on a vacant parcel at the northeast corner of Rancho Vista Boulevard and 20th Street West in the City of Palmdale. The Proposed Project involves the construction varying densities of residential development. The multi-family components will include a 320-unit apartment complex and a 60-unit triplex development. The single-family component will include 48 detached single-family residences. The Proposed Project includes a General Plan Amendment and Zone Change to allow construction of higher density residential facilities on-site.

B. Environmental Factors Potentially Affected

The environmental factors checked below would be potentially affected by this project, involving at least one impact that is a “Potentially Significant Impact”, as indicated by the checklist on the following pages. Potentially significant impacts that are mitigated to “Less Than Significant” are not shown here.

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

C. Determination

On the basis of this initial evaluation: (Select one)

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

☒ I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because the mitigation measures described on an attached sheet have been added to the project. A MITIGATED NEGATIVE DECLARATION will be prepared.

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

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

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

2/19/2020
Date

Carlene Saxton
Acting Planning Manager

D. Evaluation of Environmental Impacts

Each of the responses in the following environmental checklist considers the whole action involved, including project-level, cumulative, on-site, off-site, indirect, construction, and operational impacts. A brief explanation is provided for all answers and supported by the information sources cited.

1. A “No Impact” answer is adequately supported if the referenced information sources show that the impact simply does not apply to projects like the one involved (e.g., the project falls outside a fault rupture zone).

2. A “Less Than Significant Impact” applies when the proposed project would not result in a substantial and adverse change in the environment. This impact level does not require mitigation measures.

3. A “Less Than Significant Impact With Mitigation Incorporated” applies when the proposed project would not result in a substantial and adverse change in the environment after additional mitigation measures are applied.

4. “Potentially Significant Impact” is appropriate if there is substantial evidence that an effect is significant. If there are one or more “Potentially Significant” entries when the determination is made, an EIR is required

4. ENVIRONMENTAL ANALYSIS

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

Project Impacts and Mitigation Measures

a) **No Impact.** The City of Palmdale has identified scenic vistas, areas, and view corridors in the General Plan Community Design Element and Environmental Resources Element. The General Plan identifies the following Scenic Routes: Barrel Springs Road, Tierra Subida Avenue, Sierra Highway south of Avenue S, Elizabeth Lake Road, Pearblossom Highway, Bouquet Canyon Road, Godde Hill Road, and the Antelope Valley Freeway south of Rayburn Road. The proposed project location has not been identified as a scenic vista, view corridor and is not adjacent to a scenic highway as identified by the City of Palmdale General Plan. Views of the open mountains surrounding the Antelope Valley are available from the project site and roadways. However, with implementation of the proposed project, these views would not change and would continue to be available from the roadways and project site. Therefore, no impacts would occur.

Mitigation Measures: No mitigation measures are necessary.

b) **No Impact**: Currently, no officially designated or eligible state scenic highways are near the Proposed Project site. The nearest designated or eligible state scenic highway is Interstate 210, approximately 25 miles southwest of the Proposed

Project site (Caltrans 2011). In addition, the project site does not contain any rock outcroppings, trees or buildings (historic or otherwise). Therefore, no impacts would occur.

Mitigation Measures: No mitigation measures are necessary.

c) **Less than Significant Impact.** The General Plan land use designation of the Proposed Project site is SFR-1 (single-family residential, 0-2 dwelling units per acre) and the site is zoned R-1-20,000 (single-family residential, minimum 20,000 square foot lot size). Land uses surrounding the Proposed Project site are within the unincorporated Los Angeles County jurisdiction areas to the north, SFR-3 (single-family residential, 3.1-6 dwelling units per acre) to the east and south, and SFR-1 (single-family residential 0-2 dwelling units per acre) to the west. Zoning surrounding the Proposed Project site includes unincorporated Los Angeles County jurisdiction areas to the north, R-1-7,000 (single-family residential, minimum 7,000 square foot lot size) to the east and south, and R-1-20,000 (single-family residential, minimum 20,000 square foot lot size) to the west. The Proposed Project will include a Planned Development document, Site Plan Review, General Plan Amendment, Zone Change and Tentative Tract Maps for the construction of a mixed-density residential development.

The construction of the Proposed Project would replace the vacant and disturbed site and would utilize building materials that would complement the aesthetics of the existing residences surrounding the site. Additionally, the Proposed Project would comply with Palmdale Municipal Code (PMC) Sections 17.86.010 and 17.87.050.H.2 which will require landscaping associated with the Proposed Project to maximize the aesthetic quality on site.

While the Proposed Project would result in visual impacts during construction such as the presence of equipment, vehicles, construction fencing, signage, and lighting, these impacts would be short term in nature and limited to the construction phase only. Once fully built, the Proposed Project would result in a permanent impact to the visual character of the Proposed Project area with the presence of the apartments, triplexes and residences with the maximum height of 35 feet. In addition, the Proposed Project would include construction Best Management Practices (BMPs) including but not limited to proper storage of equipment, project site maintenance and clean up, dust control measures, and limiting hours of construction within the hours mandated by PMC Section 8.28.030 (i.e. 6:30 am to 8 pm Monday through Saturday) in order to minimize any impacts regarding the visual character of the area.

Permanent impacts would include the presence of a new development on a currently vacant site. The Proposed Project is located within an urbanized area and the surroundings are fully developed with residential and religious assembly buildings. The Proposed Project uses would be consistent with the General Plan with the approval of the proposed General Plan Amendment and the building height will be compatible with heights allowed within the surrounding area. Therefore, implementation of the Proposed Project would result in a less than significant impact associated with visual character and scenic quality.

Mitigation Measures: No mitigation measures are necessary.

d) **Less than Significant Impact**. The Proposed Project will include temporary and permanent lighting to the Proposed Project area.

During construction, the Proposed Project will include temporary construction lighting for areas requiring additional lighting such as confined spaces, and any digging. The Proposed Project will limit construction hours within the PMC requirement where construction activities are restricted between 8:00 PM to 6:30 AM. Other additional lighting sources would come from vehicles and other large operating equipment. Once operational, permanent lighting sources will be from outdoor lighting necessary to ensure safety and vehicle lights.

Lighting associated with the Proposed Project would be required to comply with PMC Section 17.86.030, which requires consistent illumination levels with the character and use of surrounding development; excessive illumination will not be allowed. Additionally, exterior lighting would be required to be located and designed to minimize glare beyond the Proposed Project site; glare onto adjacent properties will be minimized by using downcast, cut-off type fixtures, as necessary, that are shielded and would direct the light towards specific areas requiring illumination. For areas that are located nearby residents, the lowest allowable lighting levels will be used.

The Proposed Project also includes submittal of a Planned Development document, which provides specific development standards for this Project. The Planned Development document does not propose any changes to the lighting requirements as specified within PMC Section 17.86.030. Therefore, implementation of the Proposed Project would result in a less than significant impact associated with light or glare.

Mitigation Measures: No mitigation measures are necessary.

	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
II. *AGRICULTURE AND FORESTRY RESOURCES***.** In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997), prepared by the California Department of Conservation as an optional model to use in assessing impacts on agriculture and farmland. Would the Project:				
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to nonagricultural use?	☐	☐	☐	☒
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	☐	☐	☐	☒
c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?	☐	☐	☐	☒
d) Result in the loss of forestland or conversion of forestland to non-forest use?	☐	☐	☐	☒
e) Involve other changes in the existing environment, which due to their location or nature, could result in conversion of Farmland to nonagricultural use or conversion of forestland to non-forest use?	☐	☐	☐	☒

Project Impacts and Mitigation Measures

a) **No impact**. The California Department of Conservation, Division of Land Resource Protection, Farmland Mapping and Monitoring Program (FMMP), tracks and categorizes land with respect to agricultural resources. Land is designated as one of the following and each has a specific definition: Prime Farmland, Farmland of Statewide Importance, Unique Farmland, Farmland of Local Importance, Grazing Land, Urban and Built-Up Land, and Other Land.

According to the Los Angeles County Farmland Map, which was last updated in 2016, the project site is designated as “Other Land”. This designation is defined as “land not included in any other mapping category, common examples include low density rural developments, brush, timber, wetland, and riparian areas not suitable for livestock grazing, confined livestock, poultry, or aquaculture facilities, strip mines, borrow pits, and water bodies smaller than 40 acres. Vacant and nonagricultural land surrounded on all sides by urban development and greater than 40 acres is mapped as other land. The proposed project would not convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance to a non-agricultural use. Therefore, no impact would occur.

Mitigation Measures: No mitigation measures are necessary.

b-d) **No Impact.** Although the project includes a zone change, the project site is currently within the single-family residential zone (minimum lot sizes of 20,000 square feet), which does not allow agricultural related uses. The proposed zones would also not allow agricultural related uses. No agricultural uses are present on the subject property or within the vicinity. The proposed project would not impact any agricultural uses. Additionally, neither the project site nor property in the vicinity of the project site is under a Williamson Act contract. Therefore, no impact would occur.

In addition, there are no forests or timberlands located within the City of Palmdale. Therefore, the proposed project would not result in the rezoning of forest or timberland and would not cause the loss of forest land or the conversion of forest land to non-forest land. Therefore, no impact would occur.

Mitigation Measures: No mitigation measures are necessary.

e) **No Impact.** Refer to response II(b-d), above.

Mitigation Measures: No mitigation measures are necessary.

		Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
III.	AIR QUALITY. Where available, the significance criteria established by the applicable air quality management district or air pollution control district may be relied upon to make the following determinations. Would the Project:				
a)	Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☒	☐
b)	Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard?	☐	☐	☒	☐
c)	Expose sensitive receptors to substantial pollutant concentrations?	☐	☐	☒	☐
d)	Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?	☐	☐	☒	☐

Project Impacts and Mitigation Measures

a) **Less than Significant Impact**. An Air Quality Study and Greenhouse Gas Study were completed for the project site by Rincon Consultants, Inc., dated March 2018 (Appendix A). Implementation of the proposed project would result in the construction of 48 single-family units, 60 multi-family triplex units, and 320 apartment units for a total of 428 new residences.

The City of Palmdale is located within the Antelope Valley Air Quality Management District (AVAQMD). National Ambient Air Quality Standards (NAAQS) and California Ambient Air Quality Standards (CAAQS) have been established for the following criteria pollutants: carbon monoxide (CO), ozone (O_3), sulfur dioxide (SO_2), nitrogen dioxide (NO_2), inhalable particulate matter (PM_{10}), fine particulate matter ($PM_{2.5}$), and lead. The CAAQS also set standards for sulfates, hydrogen sulfide, and visibility.

<u>Sources of Emissions</u>
The emissions associated with the Proposed Project consist of construction and operational emissions. Construction emissions are temporary and include emissions of criteria pollutants and greenhouse gases from construction activities during site preparation, grading, paving, building construction, and architectural coating application. Operational emissions consist of area sources (i.e., re-applying architectural coatings, consumer products, and landscaping equipment), energy use (i.e., electricity and natural gas), mobile sources (e.g., commuting), stationary sources (i.e., emergency generator), solid waste disposal, and water and wastewater use (i.e., supplying and treating water and wastewater).

<u>Emissions Estimates</u>
Table 1 presents the annual emissions summaries from the construction and operation of the Proposed Project. Emissions were estimated using CalEEMod Version 2016.3.2. The detailed emissions model outputs are included in Appendix A of the Air Quality Analysis. This Proposed Project is not considered one of the project types that the AVAQMD CEQA Guidelines require to be evaluated for potentially exposing sensitive receptors to substantial pollutant concentrations. As such, toxic air contaminants (TAC) emissions were not calculated, and the Proposed Project was not evaluated for potential health risks to sensitive receptors.

Table 1: Annual Construction and Operational Emissions Summary

Emissions Source	Total Emissions (tons per year)					
	ROG	NO_X	CO	SO_X	PM_{10}	$PM_{2.5}$
Construction Emissions						
Year 1 Construction (2019)	0.6	4.9	4.2	< 0.01	0.8	0.4
Year 2 Construction (2020)	1.5	4.8	5.3	< 0.01	0.9	0.4
Year 3 Construction (2021)	0.9	1.6	1.9	< 0.01	0.3	0.1
Operational Emissions						
Area Sources	2.7	0.2	3.3	< 0.01	< 0.01	< 0.01
Energy	< 0.01	0.3	0.1	< 0.01	< 0.01	< 0.01
Mobile	0.8	4.3	10.8	< 0.01	3.2	0.9
Total Operational Emissions	**3.6**	**4.8**	**14.2**	**< 0.01**	**3.2**	**0.9**
Significant Emissions Threshold	**25**	**25**	**100**	**25**	**15**	**12**
Threshold Exceeded?	**No**	**No**	**No**	**No**	**No**	**No**

Construction Emissions

Table 3 provides the anticipated number of construction equipment that will be used during each phase, the hours per day the equipment will be operated, and the horsepower of the equipment. The values in the table are based on CalEEMod default values and input from the client. The number of graders and scrapers were increased based on the anticipated construction equipment list provided by the client.

For fugitive dust emissions, CalEEMod defaults do not include any control of fugitive dust from Project construction sites. AVAQMD Rule 403 requires that fugitive dust from any “active operation, open storage pile or disturbed surface area” be controlled so that no presence of dust remains visible beyond the property line. To meet this requirement, the standard operation is watering active sites three times per day. Although the addition of watering for dust control is listed as a mitigation measure in CalEEMod, within the AVAQMD this is a requirement, and is therefore included in the construction.

Table 2: Construction Equipment

Construction Phase	Equipment	Number of Equipment	Hours per day	Horsepower
Site Preparation	Rubber Tired Dozers	3	8	247
	Tractors/Loaders/Backhoes	4	8	97
Grading	Excavators	2	8	158
	Graders	1	8	187
	Rubber Tired Dozers	1	8	247
	Scrapers	2	8	367
	Tractors/Loaders/Backhoes	2	8	97
Building Construction	Cranes	1	7	231
	Forklifts	3	8	89
	Generator Sets	1	8	84
Building Construction (cont.)	Tractors/Loaders/Backhoes	3	7	97
	Welders	1	8	46
Paving	Pavers	2	8	130
	Paving Equipment	2	8	132
	Rollers	2	8	80
Architectural Coating	Air Compressors	1	6	78

Operational Emissions

Operational emissions consist of area sources (i.e., re-applying architectural coatings, consumer products, and landscaping equipment), energy use (i.e., electricity and natural gas), mobile sources (e.g., commuting), stationary sources (i.e., emergency generator), solid waste disposal, and water and wastewater use (i.e., supplying and treating water and wastewater).

For area source architectural coating operations (i.e., re-applying coatings), VOC emissions were calculated based on the assumption that the coatings would be compliant with the VOC content limits of the AVAQMD's Rule 1113.

Based on client input, the residential units will not have fireplaces or woodstoves installed. In addition, the apartment buildings may have emergency generators installed. To quantify the potential emissions, it was assumed that a 150-horsepower natural gas-fired emergency generator would be installed. The emissions from the emergency generator were conservatively estimated assuming a maximum daily usage of 24 hours per day and a maximum annual usage of 500 hours per year.

For mobile source emissions, the number of trips were calculated using the trip rates (weekday trip rates) that were included in the traffic study and the Saturday and Sunday trip rates that were provided by Integrated Engineering Group. As stated within the Air Quality Study, emissions were modeled using three land use types in CalEEMod. The Institute of Transportation Engineers (ITE) Trip Generation manual, 10th Edition combines the apartments and triplexes under the same Multifamily Housing land use type. This is why the same trip rate is used for the individual residential land use types in CalEEMod.

Based on the Air Quality Study, the Proposed Project is not anticipated to conflict or obstruct with implementation of an applicable air quality plan. As shown in Table 1 above, the estimated annual and daily emissions of construction and total operational emissions are below the applicable thresholds. While the Proposed Project would involve the use of equipment during construction, the results from the Air Quality Study indicated that emissions will be below the AVAQMD Significant Emissions Thresholds (Appendix A). As required by Section 8.04 of the PMC, the Proposed Project would implement fugitive dust control measures. These measures include, but are not limited to, suspending grading operations, application of water and/or chemical stabilizers, temporary coverings, installation of silt fencing, or the establishment of vegetative ground cover (PMC 2019). In addition, the Conditions of Approval for the project will require compliance with AVAQMD Rule 403, which will require minimization of site disturbance as feasible, treatment of graded and excavated materials, ensuring that all soil is stabilized, avoiding grading activities during wind advisory days, and sweeping streets. Compliance with these measures and applicable regulations of the California Air Resources Board (CARB) and AVAQMD would minimize potential air quality impacts. Impacts would be less than significant.

<u>Mitigation Measures</u>: No mitigation measures are necessary.

b) **Less than Significant Impact.** The activities required to construct the proposed project would generate emissions associated with construction vehicles and equipment, grading, paving of roadways, etc. Project-related emissions were calculated using the CalEEMoD. The calculations shown in **Table 1** demonstrate emissions from construction and operation of criteria pollutants for each construction year. These emissions are not anticipated to exceed the construction emission thresholds established by the AVAQMD. Additionally, all work would comply with the AVAQMD's rules and regulations, particularly those pertaining to construction equipment and dust control (such as Rule 403).

The proposed project, in conjunction with other development as allowed by the General Plan, would result in a cumulative increase in pollutants. However, since the emissions associated with the construction and operation of the proposed project does not exceed any established thresholds; the contribution would not be cumulatively considerable. Therefore, impacts would be less than significant.

Mitigation Measures: No mitigation measures are necessary.

c) **Less than Significant Impact**. According to the AVAQMD, CEQA, and Federal Conformity Guidelines, residences, schools, daycare centers, playgrounds and medical facilities are considered sensitive receptor land uses. The following project types proposed for sites within the specified distance to an existing or planned (zoned) sensitive receptor land use must be evaluated:

- Any industrial project within 1,000 feet
- A distribution center (40 or more trucks per day) within 1,000 feet
- A major transportation project (50,000 or more vehicles per day) within 1,000 feet
- A dry cleaner using perchloroethylene within 500 feet
- A gasoline dispensing facility within 300 feet

According to the Air Quality Study, the Proposed Project is not considered one of the project types that the AVAQMD CEQA Guidelines require to be evaluated for potentially exposing sensitive receptors to substantial pollutant concentrations. As such, toxic air contaminates emissions were not calculated, and the Proposed Project was not evaluated for potential health risks to sensitive receptors (Appendix A). The Proposed Project would serve as a residential development and would not include activities that would generate substantial pollutant concentrations. Impacts would be less than significant.

Mitigation Measures: No mitigation measures are necessary.

d) **Less than Significant Impact.** Construction-related sources of odors will come from construction equipment ranging from exhaust fumes to grease and oils. Impacts from construction-generated odors can be dependent upon the source, frequency of the generation of the odor, intensity, wind direction, and receptor sensitivity. The impacts from odors would be temporary and will occur only during construction. The short-term odors that would be generated by the equipment would dissipate. Additionally, the Proposed Project would comply with AVAQMD Rule 403 to control fugitive dust emissions.

During the Proposed Project operations, outside of normal maintenance equipment, no anticipated uses of materials would result in substantial emissions of odors and dust. Therefore, impacts would be less than significant.

Mitigation Measures: No mitigation measures are necessary.

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

Project Impacts and Mitigation Measures

a) **Less than Significant Impact with Mitigation Incorporated**. A Biological Resource Assessment was completed for the project site by Mark Hagan, Wildlife Biologist, dated March 21, 2018 (Appendix B). The survey indicates that the project site was characteristic of a fairly dense vegetated site with some signs of human encroachment. No desert tortoises (*Gopherus agassizii*) or their sign were observed. No burrowing owls (*Athene cunicularia*) or their sign were observed. California ground squirrel (*Citellus beecheyi*) burrows were observed within the study site. California ground squirrel burrows provide future potential cover sites for burrowing owls. The vegetation within the study site provides potential nesting sites for migratory birds. The proposed project area was not located within the geographic range of the Mohave ground squirrel (*Spermophilus mohavensis*). The study area did not appear suitable to support Mohave ground squirrels. Mohave ground squirrels are not expected to be present within the study area.

Although the project site does not currently contain any active burrowing owl burrows, construction disturbances during the nesting season (February to July) has the potential to impact nesting burrowing owls. As such, the following mitigation measures are required to reduce potential impacts to below a significant level.

Mitigation Measures:

BIO-1: A pre-construction presence/absence survey for burrowing owl shall be conducted within 30 days prior to any on-site ground disturbing activity. The survey shall be conducted pursuant to the recommendations and guidelines established by the California Department of Fish and Wildlife (CDFW). In the event these species are not identified within the project limits, no further mitigation is required. If, during the pre-construction survey, the burrowing owl is found to occupy the site, Mitigation Measure **BIO-2** shall be required.

BIO-2: If burrowing owls are identified during the survey period, the City shall require the project applicant to take the following actions to offset impacts prior to ground disturbance:

Active nests within the areas scheduled for disturbance or degradation shall be avoided from February 1 through September 15, and a minimum 250-foot buffer shall be provided until fledging has occurred. Following fledging, owls may be passively relocated by a qualified biologist. If impacts on occupied burrows in the non-nesting period are unavoidable, on-site passive relocation techniques may be used if approved by the CDFW to encourage owls to move to alternate burrows outside of the impact areas.

If relocation of the owls is approved for the site by the CDFW, the City shall require the developer to hire a qualified biologist to prepare a plan for relocating the owls to a suitable site. The relocation plan shall include all of the following:

- The location of the nest and owls proposed for relocation;
- The location of the proposed relocation site;
- The number of owls involved and the time of year when the relocation is proposed to take place;
- The name and credentials of the biologist who will be retained to supervise the relocation;
- The proposed method of capture and transport for the owls to the new site;

- A description of site preparation at the relocation site (e.g., enhancement of existing burrows, creation of artificial burrows, one-time or long-term vegetation control); and,
- A description of efforts and funding support proposed to monitor the relocation.

b) **Less Than Significant Impact**. The Proposed Project consists of disturbed Joshua tree and California juniper ecotone, and does not contain any wetlands, desert washes, or riparian habitats. There were no blue line streams documented on the USGS Quadrangle for the Proposed Project area. No ephemeral washes were observed. There were no identified sensitive natural communities within the Proposed Project area. While the vegetation within the site provides potential nesting sites for migratory birds, there were no sensitive plant species that were observed within the Proposed Project area. Therefore, impacts would be less than significant.

Mitigation Measures: No mitigation measures are necessary.

c) **No Impact**. As previously discussed in Section IV Impact (b), the Proposed Project area does not contain any wetlands. No impact would occur.

Mitigation Measures: No mitigation measures are necessary.

d) **Less Than Significant Impact with Mitigation Incorporated**. Many species of birds and their active nests are protected under the Migratory Bird Treaty Act (MBTA). According to the Biological Resources Assessment, the vegetation within the study area provides potential nesting sites for birds. As such, mitigation measure **BIO-3** will be implemented to minimize potential impacts to birds and active nests.

Mitigation Measure:

BIO-3: If Project grading/construction activities are scheduled to occur during the nesting season for breeding birds (typically January 15^{th} through September 30^{th}), the following measures shall be implemented:

- Within seven days prior to commencement of grading/construction activities, a qualified biologist shall perform a pre-construction survey of all proposed work limits and within 500 feet of the proposed work limits.

- If active avian nest(s) of non-special-status species are discovered within or 500 feet from the work limits, a buffer shall be delineated around the active nest(s) measuring 300 feet for passerines and 500 feet for raptors. A qualified biologist shall monitor the nest(s) weekly after commencement of grading/construction to ensure that nesting behavior is not adversely affected by such activities.

- If the qualified biologist determines that nesting behavior of non-special-status species is adversely affected by grading/construction activities, then a noise mitigation program [i.e., within 10 calendar days prior to the start of construction activities (including removal of vegetation), a qualified biologist conducts a pre-construction survey to determine the presence or absence of nesting birds on the proposed area of disturbance; if nesting birds are detected, the biologist prepares a letter report and mitigation plan in conformance with applicable federal and State laws (e.g., appropriate follow-up surveys, monitoring schedules, construction and noise barriers/buffers) to ensure that take of birds or eggs or disturbance of breeding activities is avoided; the report/mitigation plan is submitted to the City for review/approval and implemented to the satisfaction of the City; and the biologist verifies in a report to the City that all measures identified in the mitigation plan are in place prior to and/or during construction] shall be implemented in consultation with CDFW, to allow such activities to proceed. Once the young have fledged and left the nest(s), then grading/construction activities may proceed within 300 feet (500 feet for raptor species) of the fledged nest(s).

e) **Less than Significant Impact with Mitigation Incorporated**. The Biological Resource Assessment (2018) provided an estimated density and distribution of Joshua trees occurring within the Proposed Project area. Line transects were walked to count, assess the health, and determine the size class of Joshua trees and to count the number of California Juniper trees. There are a total of 67 Joshua trees on-site, as determined by the line transect survey, and approximately 236 California juniper trees. For parcels containing Joshua trees (*Yucca brevifolia*) and California juniper trees (*Juniperus californica*), the City of Palmdale requires preparation of a native vegetation preservation plan. As required by PMC Chapter 14.04, Joshua trees must be transplanted, while California Juniper trees are not viable for transplantation. As such, in order to reduce impacts on biological resources to a less than significant level, Mitigation Measures **BIO-4** and **BIO-5** are required. With implementation of the PMC requirements, the Proposed Project will not conflict with any City policies and impacts would be less than significant.

Mitigation Measures:

BIO-4: The applicant shall submit a native desert vegetation plan prepared by a desert native plant specialist. The plan shall, at minimum, include the following:

- A written report and a site plan which depicts the location of each Joshua tree and California juniper, discusses their age and health, identifies and locates all trees and shrubs which can be saved in place or relocated.
- A site landscaping plan showing the proposed location of those Joshua trees, California junipers, and any other native desert vegetation that will remain on-site.
- A long-term maintenance program for any desert vegetation preserved on the site. The minimum term of any maintenance program shall be two growing seasons, unless a shorter length of time is approved by the City.

BIO-5: Two years following Joshua tree transplanting, a written report shall be submitted to the City. This report shall indicate the number of Joshua trees transplanted, the date(s) of transplanting, the method of transplanting, dates Joshua trees are watered, and the number of Joshua trees surviving.

f) **Less Than Significant Impact**. The Proposed Project is within the boundaries of the West Mojave Plan (habitat conservation plan) (Bureau of Land Management 2005). However, while the Proposed Project is located within the geographic range of special species of concern, state listed, and federal listed species, none are expected to occur within the Proposed Project area due to the high level of disturbance and lack of thriving habitats. The Proposed Project area is completely surrounded by urban development, is not located within a Significant Ecological Area or Regional Habitat Linkages for Los Angeles County (Department of Regional Planning 2014), and would not interfere with the Desert Renewable Energy Conservation Plan. Impacts would be less than significant.

Mitigation Measures: No mitigation measures are necessary.

		Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
V. CULTURAL RESOURCES. Would the Project:					
a)	Cause a substantial adverse change in the significance of a historical resource pursuant to Public Resources Code Section 21084.1 and CEQA Guidelines Section 15064.5?	☐	☐	☒	☐
b)	Cause a substantial adverse change in the significance of an archaeological resource as defined in Public Resources Code Section 21083.2 and 281084.1 and CEQA Guidelines Section 15064.5?	☐	☒	☐	☐
c)	Disturb any Native American tribal cultural resources or human remains, including those interred outside of dedicated cemeteries?	☐	☒	☐	☐

Project Impacts and Mitigation Measures

a) **Less than Significant Impact**. A cultural resources survey was conducted for the project site by RT Factfinders Cultural Resources and documented in a report entitled "Phase 1 Cultural Resource Investigation For 33-Acres at the Corner of 20th Street West and Rancho Vista Blvd. Palmdale, Los Angeles County, California", and dated December, 2017. The assessment of the project site included both a records search and a physical survey.

As specified within the Cultural Resources Investigation (2017), one historic period site was found and evaluated as not significant. There are no known significant historical resources associated with the improvements on the project site. Therefore, impacts would be less than significant.

Mitigation Measures: No mitigation measures are necessary.

b) **Less than Significant Impact with Mitigation Incorporated**. No known archaeological resources exist on the site. The project site is located within an urbanized area. There is very low likelihood of impacting archeological resources.

Nonetheless, during excavation and grading activities associated with construction of the project, a remote possibility exists that historical or cultural resources may be discovered. If that should occur, the project applicant will be required to comply with existing regulations, including California Public Resources Code Section 21083.2 that specifies the protocol if archaeological resources are discovered during excavation, grading, or construction activities. If standard procedures are followed in the event cultural/historical resources are uncovered at the project site, the project's impact would be less than significant. In the event that cultural resources are encountered during the course of construction activities, all work must cease until a qualified archaeologist determines the proper disposition of the resource. With implementation of the mitigation measure listed below, impacts would be less than significant.

Mitigation Measures:

CUL-1: Due to the heightened cultural sensitivity of the proposed project area, an archaeological monitor with at least three years of regional experience in archaeology shall be present for all ground-disturbing activities that occur within the proposed project area (which includes, but is not limited to, tree/shrub removal and planting, clearing/grubbing, grading, excavation, trenching, compaction, fence/gate removal and installation, drainage and irrigation removal and installation, hardscape installation [benches, signage, boulders, walls, seat walls, fountains, etc.], and archaeological work). A sufficient number of archaeological monitors shall be present each work day to ensure that simultaneously occurring ground disturbing activities receive thorough levels of monitoring coverage. The monitor(s) shall have the ability to recommend, with written and photographic justification, the termination of monitoring efforts to the Lead Agency, and should the Lead Agency, the San Manuel Band of Mission Indians Cultural Resources Department (SMBMI) and the Fernandeño Tataviam Band of Mission Indians concur with this assessment, then monitoring shall cease.

CUL-2: A Monitoring and Treatment Plan (MTP) that is reflective of the project mitigation ("Cultural Resources" and "Tribal Cultural Resources") shall be completed by the archaeologist and submitted to the Lead Agency for dissemination to the San Manuel Band of Mission Indians Cultural Resources Department (SMBMI) and the Fernandeño Tataviam Band of Mission Indians. The MTP shall note that any and all pre-contact findings will be subject to the protocol outlined in **TCR-1**. The MTP shall also state the frequency by which the archaeological monitor will submit monitoring logs to the Lead Agency, SMBMI, and Fernandeño Tataviam Band of Mission Indians. Once all parties review and approve the MTP, it shall be adopted by the Lead Agency, which shall occur prior to permitting for the project. At the conclusion of monitoring for the project, a draft monitoring report shall be submitted to the Lead Agency, SMBMI and the Fernandeño Tataviam Band of Mission Indians for review, and the final monitoring report shall be submitted to all parties for their records.

c) **Less than Significant Impact with Mitigation Incorporated**. Refer to responses V(a) and V(b), above. While there are currently no identified Native American cultural resources and low likelihood to encounter previously unknown and unrecorded human remains, in the unlikely event that human remains, or other buried materials are encountered, Mitigation Measure **TCR-2** will apply in order to reduce impacts to a less than significant level.

<u>Mitigation Measure</u>: See Section XVIII.

	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
VI. ENERGY. Would the Project:				
a) Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?	☐	☐	☒	☐
b) Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?	☐	☐	☒	☐

Project Impacts and Mitigation Measures

a) **Less than Significant Impact**. The Proposed Project would result in increased use of energy (such as natural gas and electricity) during the construction phase. Energy usage would come from fuels to power construction vehicles and equipment and electricity with the use of equipment, lighting during construction, dust control, and during the production of materials such as asphalt, steel, concrete, pipes, and other materials. Energy use during construction would be temporary and cease once the Proposed Project has been completed.

Once in operation, the Proposed Project would result in increased use of energy for the operation and maintenance of the Proposed Project. The construction and design of the Proposed Project would be required to comply with the 2019 California Energy Code Title 24 Part 6 for energy efficiency standards for residential buildings. The Proposed Project will be built in accordance with the Palmdale Green Building Code (PMC Chapter 8.04.200). In addition, the City of Palmdale adopted an Energy Action Plan in 2011 providing recommendations and measures to improve energy efficiency for existing and new development (City of Palmdale 2011). Utilizing the recommendations within the Energy Action Plan, along with compliance with the Green Building Code would ensure that impacts would be less than significant.

Mitigation Measures: No mitigation measures are necessary.

b) **Less than Significant Impact**. As noted in Section VI(a) above, the construction and operation of the Proposed Project would be required to comply with Title 24 of the California Code of Regulations. Compliance with this regulation would reduce any impact associated with an obstruction of a plan for renewable energy or energy efficiency. The impact would be less than significant.

Mitigation Measures: No mitigation measures are necessary.

	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
VII. GEOLOGY AND SOILS				
a) Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:	☐	☐	☒	☐
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Map issued by the State Geologist for the area or based upon on other substantial evidence of a known fault?	☐	☐	☒	☐
ii) Strong seismic ground shaking?	☐	☐	☒	☐
iii) Seismic-related ground failure, including liquefaction?	☐	☐	☒	☐
iv) Landslides?	☐	☐	☒	☐
b) Result in substantial soil erosion or the loss of topsoil?	☐	☐	☒	☐
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	☐	☐	☒	☐
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property?	☐	☐	☒	☐
e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?	☐	☐	☐	☒
f) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☒	☐	☐

Project Impacts and Mitigation Measures

a) **i) and ii) Less than Significant Impact**. A Geotechnical Investigation Report was completed for the project site by Bruin Geotechnical Services, Inc., dated November 6, 2017 (Appendix C).

Surface Fault Rupture

The project site does not lie within a currently delineated State of California, Alquist-Priolo Earthquake Fault Zone. Well-delineated fault lines cross through this region as shown on California Geological Survey (CGS) maps. Therefore, active fault rupture is unlikely to occur at the project site. While fault rupture would most likely occur along previously established fault traces, future fault rupture could occur at other locations.

Historical Seismicity

The Palmdale area is in the seismically active southern California with at least eight prominent major earthquakes historically affecting the area. These include the 1812 Wrightwood, 1857 Fort Tejon, 1872 Owens Valley, 1952 Arvin-Tehachapi, 1971 San Fernando, 1992 Landers, 1994 Northridge, and 1999 Hector Mine earthquakes. Strong ground motions were experienced with magnitudes ranging from approximately 6.5 to 7.9. Approximately 35 magnitude 5.5 or greater historic earthquakes have occurred within 60 miles of the Proposed Project.

Design and construction of the new facilities would comply with all seismic-safety development requirements, including the Title 24 standards of the current California Building Code. Therefore, implementation of the Proposed Project would result in a less than significant impact associated with strong seismic ground shaking.

iii) Less Than Significant Impact.

Soil Liquefaction and Lateral Spreading

Liquefaction is the loss of soil strength from sudden shock (usually earthquake shaking), causing the soil to become a fluid mass. Liquefaction describes a phenomenon in which saturated soil loses shear strength and deforms as a result of increased pore water pressure induced by strong ground shaking during an earthquake. Dissipation of the excess pore pressures will produce volume changes within the liquefied soil layer, which can cause settlement. Shear strength reduction combined with inertial forces from the ground motion may also result in lateral migration (lateral spreading). Factors known to influence liquefaction include soil type, structure, grain size, relative density, confining pressure, depth to groundwater, and the intensity and duration of ground shaking. Soils most susceptible to liquefaction are saturated, loose sandy soils and low plasticity clay and silt. In general, for the effects of liquefaction to be manifested, groundwater levels must be within 50 feet of the ground surface and the soils within the saturated zone must also be susceptible to liquefaction. The project does not lie in a zone designated by California Geologic Survey for the Ritter Ridge Quadrangle. Exploration did not reveal a shallow groundwater table or a perched water table. Research of nearby water well data and historic groundwater levels indicate both current and historic groundwater tables are greater than 50 feet below the ground surface. Since groundwater tables are greater than 50 feet below the existing ground surface (bgs), the estimated the potential for liquefaction at the site is low.

Lateral spreading (lateral migration) is caused when a loose and saturated soil layer is liquefied by a nearby earthquake of sufficient magnitude and a sloping ground, free face conditions, or sufficient building/embankment stresses exist near the site. Currently, these factors are not present at this site. The field and laboratory testing indicate that the soils within 50 feet of the surface are not subject to liquefaction. Therefore, lateral spreading at this site has a low potential.

Because the Proposed Project site is not subject to liquefaction and contains low potential for lateral spreading, potential impacts associated with liquefaction or ground-failure are less than significant.

iv) Less than Significant Impact. The site is relatively flat and proposed new slopes are anticipated to be less than 5 feet high. The site is not within any of the Earthquake Induced Landslide Hazard Zones designated by the Seismic Hazard Zone Map for the Ritter Ridge Quadrangle. Therefore, potential hazards from slope instability, landslides, or debris flows are considered very low and impacts would be less than significant.

Mitigation Measures: No mitigation measures are necessary.

b) **Less than Significant Impact**. Construction of the Proposed Project would require the preparation of a Storm Water Pollution Prevention Plan (SWPPP); the SWPPP identifies best management practices (BMPs) to reduce soil erosion and runoff from the construction site during construction. The Proposed Project will also comply with the recommendations provided in Appendix C during grading, foundation, and slope construction. Compliance with the BMPs identified in the SWPPP and implementation of the recommendations would reduce any impacts associated with erosion. Therefore, this impact is less than significant.

Mitigation Measures: No mitigation measures are necessary.

c) **Less than Significant Impact**. As noted in Section VII (a)(iv), the Proposed Project site is relatively flat and would not increase on- or off-site landslide potential. As discussed in Section VII (a)(iii), impacts associated with seismically induced liquefaction, landslides and lateral spreading are low, impacts would be less than significant.

Mitigation Measures: No mitigation measures are necessary.

d) **Less than Significant Impact**. As expansive soils absorb water they swell, and as they lose water they shrink. Expansive soils may become unstable during ground shaking and are one of the most prevalent causes of earthquake damage to buildings. The Proposed Project site is located in an area considered to have very low expansion potential as defined by ASTM D 4829 and the 2019 California Building Code. With the incorporation of the recommendations provided within Appendix C relating to expansive soil, any potential impacts would be reduced to less than significant.

Mitigation Measures: No mitigation measures are necessary.

e) **No Impact**. The Proposed Project would not involve activities that would require the installation of septic tanks or alternative wastewater disposals systems. The Proposed Project will connect to existing sewer systems that discharge to Los Angeles County Sanitation District #20 and the Palmdale Water Reclamation Plant. No impact would occur.

Mitigation Measures: No mitigation measures are necessary.

f) **Less than Significant Impact with Mitigation Incorporated**. According to the General Plan, a Paleontologic Sensitivity Study was prepared for the Palmdale area in 1990 identifying high, unknown, and low potential areas of paleontological resources based on the assessment of identified paleontological resources in the rock units. Paleontological resources, or fossils, represent the remains, imprints, or traces of once-living organisms preserved in rocks and sediments. These include mineralized, partly mineralized, or un-mineralized bone and teeth, soft tissues, shell, wood, leaf impressions, footprints, burrows, and microscopic remains. According to the Paleontological Sensitivity Map in the General Plan, the Proposed Project is located in an area of undetermined potential of paleontological resources (City of Palmdale 1993). The undetermined potential does not preclude the possibility of undiscovered resources to be present within the Proposed Project. Deeper excavations could encounter unique and significant resources. Implementation of the mitigation measure below would reduce impacts to unique paleontological resources to less than significant.

Mitigation Measures:

GEO-1: In the event that paleontological resources are encountered, all work shall stop at the discovery site. At that time, a qualified paleontological monitor shall be consulted to evaluate the find. Construction activities shall be temporarily redirected to another location on-site (minimum of 100 feet from the location of the find) so that the monitor can recover any specimens encountered during excavation. All fossils/specimens collected during this work shall be deposited in a City approved museum repository for curation and storage.

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

Project Impacts and Mitigation Measures

a) **Less than Significant Impact**. Refer to response III(b), above. The proposed project involves the construction and occupancy of 48 single-family residences, 60 multi- family triplex units, and 320 apartment units for a total of 428 units within a Planned Development. An Air Quality Study and Greenhouse Gas Study was completed for the project site by Rincon Consultants, Inc., dated March 2018 (Appendix A). The proposed project would generate air emissions during construction activities, some of which may be greenhouse gases. Based upon the CalEEMod readings, year 1-3 construction emissions of the project will generate 1,075.5, 1,497.6, and 508.1 metric tons of CO2 equivalent per year (see **Table 3, Estimated Construction Emissions of Greenhouse Gases).** The maximum combined 2020 construction emissions with the annual operational (stationary and mobile source) emissions associated with the project when the project is both constructed and operational would total approximately 6,443 metric tons of CO2 equivalent per year (see **Table 4, Combined Annual Emission Tons of CO2e, per year**). The construction and operational greenhouse gas emissions are well below the AVAQMD-recommended significance threshold of 100,000 tons of CO2e per year and therefore would not prevent the State from reaching its greenhouse gas reduction targets. Therefore, impacts would be less than significant.

Mitigation Measures: No mitigation measures are necessary.

Table 3. Estimated Construction Emissions of Greenhouse Gases

Emission Source	Total Emissions (tons per year)
	CO2
Year 1 Construction Emissions (2019)	1,075.5
Year 2 Construction Emissions (2020)	1,497.6
Year 3 Construction Emissions (2021)	508.1
Maximum tons per year	1,497.6
Significant Emissions Threshold	100,000
Exceeds Threshold?	No

Source: CalEEMod

Table 4. Combined Annual Emissions Tons of CO2e/year

Emission Source	Project Emissions CO2
2021 Construction Emissions	508.1
Operational	
Area	214.4
Energy	1,223.4
Solid Waste	130.7
Water	253.3
Mobile	
CO2, and CH4	3,921.5
N2O	191.9
Total	6,443.4
AVAQMD Threshold	100,000
Exceeds Threshold?	No

Source: CalEEMod

b) **Less than Significant Impact**. Refer to response VII(a), above. The project would not result in GHG emissions above the thresholds established by AVAQMD to identify projects that require additional mitigation measures to achieve statewide GHG targets contained in Assembly Bill (AB) 32.

The Palmdale General Plan contains policies which require projects to promote attainment of state and federal air quality standards and all projects must comply with the City's Green Building Ordinance and Palmdale Energy Action Plan. The project is consistent with the General Plan and would be required to implement City, regional, and State policies adopted for the purpose of reducing GHGs. Therefore, impacts with respect to conflicts with an agency's plans, policies and regulations would be less than significant

Mitigation Measures: No mitigation measures are necessary.

		Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
IX. HAZARDS AND HAZARDOUS MATERIALS. Would the Project:					
a)	Create a significant hazard to the public or the environment through the routine transport, use, emission or disposal of hazardous materials?	☐	☐	☒	☐
c)	Create a significant hazard to the public or the environment through reasonable foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	☐	☐	☒	☐
d)	Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☐	☐	☒
e)	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?	☐	☐	☐	☒
f)	For a project located within an airport land use plan area or, where such a plan has not been adopted, within 2 miles of a public airport or a public use airport, result in a safety hazard for people residing or working in the project area?	☐	☐	☐	☒
g)	Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	☒	☐
g)	Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires?	☐	☐	☐	☒

Project Impacts and Mitigation Measures

a) **Less than Significant Impact**. The Proposed Project will utilize potentially hazardous materials during the construction phase such as the storage, use, and disposal of fuels, oils, lubricants, cements, petroleum-based products, and other construction-related materials. The handling of these chemicals has the potential to accidentally release hazardous materials to the environment. The handling and disposal of potentially hazardous materials will be done in compliance with the products' Safety Data Sheets and applicable federal, State, and local regulations and would be managed by a licensed provider. The use of these materials will be limited during the construction phase. Storage, handling, and disposal of these materials would be required to comply with regulations set forth by State and federal agencies regarding hazardous materials, such as the Hazardous Materials Transportation Act, Resource Conservation and Recovery Act, the California Hazardous Material Management Act, and the California Code of Regulations, Title 22. Adherence to these regulations would reduce impacts related to routine transport, use, or disposal of hazardous materials to a level less than significant.

During the Proposed Project operation, use of hazardous materials by the Proposed Project would be limited to minor amounts used for maintenance, building repair, household cleaning, and landscaping. In the unlikely event that the Proposed Project would generate hazardous materials, it is not anticipated that they would be acutely hazardous and would be transported, used, and disposed of consistent with applicable regulations. This impact is less than significant.

Mitigation Measures: No mitigation measures are necessary.

b) **Less Than Significant Impact**. As described in Section IX (a) above, adherence to regulations set forth by State and federal agencies regarding storage, handling, and disposal of hazardous materials would reduce the potential for impacts associated with accident conditions during construction to a less than significant level. The Proposed Project would not routinely use substantial amounts of hazardous materials that would result in a significant risk of release into the environment. Furthermore, new structures associated with the Proposed Project would be constructed consistent with all applicable safety regulations and would not introduce accident conditions that could result in the release of hazardous materials into the environment. Impacts would be less than significant.

Mitigation Measures: No mitigation measures are necessary.

c) **No Impact**. The nearest school to the Proposed Project site is Summerwind Elementary School, which is located approximately 0.26 miles to the south of the Proposed Project site. The school is located at 39360 Summerwind Drive, Palmdale, California. Given that the school is more than 0.25 miles away from the Proposed Project site, implementation of the Proposed Project would not result in hazardous emissions within 0.25 mile of a school. No impact would occur.

Mitigation Measures: No mitigation measures are necessary.

d) **No Impact**. A review of federal and state standard and supplemental databases indicated that the Proposed Project site is not located within any identified hazardous material site pursuant to Government Code Section 65962.5. No hazardous materials sites are located within one-quarter mile of the Project site (SWRCB 2019, DTSC 2019). The Proposed Project would not create a significant hazard to the public or environment. No impacts would occur.

Mitigation Measures: No mitigation measures are necessary.

e) **No Impact**. The nearest airport to the Proposed Project site is Palmdale Regional Airport and Air Force Plant 42, located approximately 3 miles northeast from the Proposed Project site. The airports are separate facilities but utilize the same runway space. The Proposed Project site is not located within a Clear Zone or Accident Potential Zone (City of Palmdale 1993). No impact would occur.

Mitigation Measures: No mitigation measures are necessary.

f) **Less than Significant Impact**. The project site is located along 20th Street West and Rancho Vista Boulevard. Rancho Vista Boulevard (Avenue P) is identified as an evacuation route according to the City's General Plan (Exhibit S-1, City of Palmdale 1993). Although the proposed project would generate additional traffic, the project will be conditioned to provide the necessary improvements to accommodate the anticipated volume of traffic to be generated by the project. As a result, the traffic generated by the proposed project is not expected to block the roadways, and the proposed project would not impair or physically block any identified evacuation routes and would not interfere with any adopted emergency response plan. Impacts would be less than significant.

Mitigation Measures: No mitigation measures are necessary.

g) **No Impact**. The Proposed Project site is not located in an area identified as a Very High Fire Hazard Severity Zone (CAL FIRE 2012). No impact would occur.

Mitigation Measures: No mitigation measures are necessary.

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

A Conceptual Hydrology Study and a Sewer Area Study were prepared for the Proposed Project by Duke Engineering on May 20, 2019, and November 20, 2019 (Appendix D, Appendix E).

Project Impacts and Mitigation Measures

a) **Less than Significant Impact**. The construction activities will include site grading, excavation, and other groundwork activities that could expose soils to construction materials and constituents and potential erosion due to wind and stormwater runoff which would impact water quality. The construction of on-site improvements would result in an increase in impervious surfaces that could increase runoff and potentially degrade water quality.

Implementation of the Proposed Project's SWPPP plan would reduce potential impacts in degradation of water quality. The Proposed Project would be designed and constructed in accordance with the stormwater pollution control requirements of the Lahontan Region of the California Regional Water Quality Control Board (RWQCB) and comply with applicable National Pollution Discharge Elimination System (NPDES) requirements.

Los Angeles County Waterworks District No. 40 provides water services to certain areas of the City of Palmdale, including the Proposed Project area and has indicated that water supplies are sufficient to service the Proposed Project's construction and operational needs. The Proposed Project would implement strategies to minimize water usage, including but not limited to, installation of water-efficient appliances and fixtures and drought-tolerant landscaping. Impacts would be less than significant.

Mitigation Measures: No mitigation measures are necessary.

b) **Less than Significant Impact**. The proposed project will not 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. The proposed project site is located within the boundaries of Los Angeles Waterworks jurisdiction. Construction and development of the project will require water service from Los Angeles County Waterworks, which has not indicated that water supplies are unavailable for the project. Furthermore, measures associated with minimizing water usage will be applied to the project, including water efficient landscape requirements and compliance with Title 24 Building Code requirements for efficient appliances and fixtures. This is consistent with current City Ordinances, including the Water Efficient Landscape Ordinance (PMC Section 14.05). While implementation of the project would increase impervious surfaces at the site the project site will drain towards the northern portion of the site, where two proposed retention/detention basins will collect storm water runoff from the surface and storm drain flows. With project features and compliance with current City Ordinances, impacts are less than significant and no mitigation is required.

Mitigation Measures: No mitigation measures are necessary.

c) **Less than Significant Impact**. The proposed project will not substantially alter the existing drainage pattern of the site or area, including the alteration of the course of a stream or river, in a manner that would result in substantial erosion or siltation on- or off-site. The proposed project is located within the Portal Ridge and Armargosa Creek watersheds, as identified within the City of Palmdale Master Plan of Drainage and the Master Plan of Drainage Update. Specifically, the Master Plan of Drainage Update analyzes pre-development and ultimate development conditions for six watersheds, including Portal Ridge and Armargosa. Based on the analysis, the Master Plan of Drainage Update recommends retention basins, regional drains, channels, and master plan facilities to serve ultimate development. Furthermore, the Palmdale Municipal Code requires development projects to mitigate the impacts of the development on the City's drainage facilities through the construction of drainage facilities in accordance with the City of Palmdale Master Plan of Drainage or payment of drainage fees that will be used to construct future drainage facilities.

The proposed project site does not contain any streams, rivers, or ephemeral drainage features. Runoff on-site moves in a sheet flow fashion toward the north. Development of the project site would result in an increase in the amount of impervious surface in the form of residential buildings and roadways. Conditions resulting from this change could degrade existing water quality due to increased runoff volumes and velocity; reduce infiltration; increased flow frequency, duration, and peak; and result in faster time to reach peak flow. However, the proposed project will be required to accommodate the existing storm flows in the project vicinity and reduce the post development storm flows to 85% of the existing condition. Furthermore, implementation of the proposed project would include the implementation of BMPs that would remove pollutants from runoff coming from the project site. With implementation of BMPs, as outlined in the project SWPPP and WQMP, and requirements specified by standard engineering practices, the project would have a less than significant impact. No mitigation is required.

Mitigation Measures: No mitigation measures are necessary.

d) **No Impact.** The project site is designated as Zone X-Shaded per the Flood Insurance Rate Map (FIRM) No. 06037C0656F, which is outside the 100-year flood zone. As a result, development of the proposed project would not place housing or structures within an area at risk of flooding. Therefore, no flooding impacts would occur as a result of the proposed project. As a result, development of the proposed project would not place housing or structures within an area at risk of flooding. Therefore, no flooding impacts would occur as a result of the proposed project.

Mitigation Measures: No mitigation measures are necessary.

e) **Less Than Significant Impact.** Refer to response X(a-c) above. The Proposed Project site is within the Los Angeles County Waterworks District No. 40, Antelope Valley. A 2015 Urban Water Management Plan was prepared for District 40. The Proposed Project does not include activities that could obstruct future water projects. Impacts would be less than significant.

Mitigation Measures: No mitigation measures are necessary.

	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
XI. LAND USE AND PLANNING. Would the Project:				
a) Physically divide an established community?	☐	☐	☐	☒
b) Cause significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☐	☒	☐

Project Impacts and Mitigation Measures

a) **No Impact**. The proposed project consists of the construction and occupancy of 48 single-family residences, 60 multi-family triplex units, and 320 apartment units for a total of 428 units within a planned development. The proposed project would not block a public street, trail or other access route or result in a physical barrier that would divide the community. Therefore, no impacts would occur.

Mitigation Measures: No mitigation measures are necessary.

b) **Less than Significant Impact**. The Proposed Project site is zoned R-1-20,000 (single-family residential, minimum 20,000 square foot lot size). The Proposed Project would include the application for a Zone Change and General Plan Amendment to increase the residential densities. The Proposed Project would not result in a significant environmental impact due to conflict with any land use plan because the Proposed Project is located within an urbanized area consisting of existing residential uses. The Proposed Project would be approved through the Site Plan Review application and the Planned Development document which would allow deviations from some development standards within the PMC. Submittal of these documents and compliance with the applicable development standards would result in a less than significant impact.

Mitigation Measures: No mitigation measures are necessary.

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

Project Impacts and Mitigation Measures

a-b) **No Impact**. The project site does not contain any mining or recovery operations for mineral resources and no such activities have occurred on the project site in the past. According to the Palmdale General Plan, the project site is not within an area containing significant mineral resources. The site is not designated in the City's General Plan or PMC for any extractive use. Such a use would be incompatible with existing adjacent land uses. Therefore, no impacts to mineral resources would occur.

Mitigation Measures: No mitigation measures are necessary.

	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
XIII. NOISE. Would the Project:				
a) Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☐	☒	☐	☐
b) Generation of excessive groundborne vibration or groundborne noise levels?	☐	☒	☐	☐

An Acoustical Analysis was prepared for the Proposed Project by Christopher Jean & Associates, Inc. dated June 28, 2019 (Appendix F).

Project Impacts and Mitigation Measures

a) **Less than Significant Impact with Mitigation Incorporated**. State Route Highway 14 is located approximately one mile east of the project site. According to the General Plan Exhibit N-5, (Future Transportation Noise Contours), the project site is located outside the 60 dB Community Noise Equivalent Level (CNEL) contour. The City of Palmdale requires all residential projects to conform to the following applicable noise criteria: Exterior, 65 dBA CNEL; Interior, 45 dbA CNEL; and Unit-to-Unit, STC 50/IIC 50.

The expected future roadway noise impact was projected using the Federal Highway Administration's Highway Noise Prediction Model (FHWA RD-77-108) together with several roadway and site parameters that determine the projected impact of vehicular traffic noise. Based on traffic input data listed in the noise study, the calculations yielded design noise levels of 75 dBA CNEL at the apartment buildings along Rancho Vista Boulevard and 70 dBA CNEL at the apartment buildings and single-family residences along 20th Street West. These exceed the maximum 65 dB noise level required by the General Plan Noise Element for residential development and would require mitigation measures.

The project site is not subject to excessive noise from railroads, since there are no railroad operations in the vicinity of the project site.

To ensure operational noise impacts do not adversely impact on-site noise sensitive uses, Mitigation Measures **NOI 1-5** are prescribed for the project.

The increase in noise levels created by construction activities would be temporary and restricted by Section 8.28.030 of the PMC, which limits construction disturbance to persons sleeping or residing within 500 feet of the construction area between the hours of 6:30 a.m. and 8:00 p.m. Monday through Saturday. For all construction related activities, noise attenuation techniques shall be employed as needed to ensure that noise remains as low as possible during construction, as described in Mitigation Measure **NOI-6** for the project.

With implementation of the prescribed mitigation measures, potentially significant impacts would be reduced to a less than significant level.

Mitigation Measures:

NOI 1: The Proposed Project shall install sound barriers for all private patios and balconies facing the Rancho Vista Boulevard and 20th Street West. Construction shall include erecting permanent barriers consisting of clear vinyl, plexiglass or some other similar material a minimum of seven feet around each first floor patio adjacent to Rancho Vista Boulevard, six feet around each second floor balcony adjacent to Rancho Vista Boulevard, five feet around each first floor patio adjacent to 20th Street West and five feet around each second floor balcony adjacent to 20th Street West.

Each barrier shall consist of a solid face from top-to-bottom. Cutouts and/or openings shall be prohibited, except for openings required for proper drainage.

NOI-2: The buildings shall be constructed, as a minimum, with the following:

1) Siding or stucco exterior walls, on 5/8-inch drywall, on 2-inch x 4-inch stud walls with R- 13 fiberglass insulation;
2) Double pane windows;
3) Double pane sliding glass doors; and,
4) Shingle roof over 1/2-inch plywood with fiberglass insulation, 5/8-inch drywall, and vented.

This will be adequate for all units with the following exceptions:

1) Add STC (sound transmission class) 34 glazing to all single family units adjacent to 20th Street West and with any unprotected view of 20th Street West (units adjacent to project entries);
2) Add STC 36 glazing to all multi-family units adjacent to 20th Street West and not protected by a sound barrier; and,
3) Add STC 36 glazing, exterior wall upgrades and baffled attic vents to all multi-family units adjacent to Rancho Vista Boulevard and not protected by a sound barrier.

NOI-3: At least one of the following widely used common floor/ceiling assemblies, all of which rate at least STC 50 shall be incorporated into the building plans:

1) 8-inch concrete slab (in compliance with State standards);
2) 1 1/2-inch lightweight concrete, plywood sub-floor, 3 1/2-inch thick fiberglass insulation, resilient channels, drywall ceiling (in compliance with State standards); or
3) 1 3/8-inch Gyp-Crete, plywood sub-floor, 2-inch by 10-inch wood joists, 3 1/2-inch thick fiberglass insulation, resilient channels, 1/2-inch drywall ceiling (in compliance with State standards).

NOI-4: At least one of the following shall be incorporated into the building plans:

1) Two layers of 1/2-inch direct nailed drywall, 2-inch by 6-inch plate, 2-inch

by 4-inch staggered studs, 3 1/2-inch fiberglass insulation, two layers of 1/2- inch direct nailed drywall (in compliance with State standards);

2) Two layers of 5/8-inch direct nailed drywall, 2-inch by 6--inch plate, 2-inch by 4-inch staggered studs, 3 1/2-inch fiberglass insulation, two layers of 5/8- inch direct nailed drywall (in compliance with State standards);
3) 5/8-inch direct nailed drywall, 2-inch by 4-inch plate with 2-inch by 4-inch studs, 3 1/2-inch fiberglass insulation, 1-inch airspace at plate, 2-inch by 4- inch plate with 2-inch by 4-inch studs, 5/8-inch: direct nailed drywall (in compliance with State standards);
4) Same as #3 but with two layers of 3 1/2-inch fiberglass insulation (in compliance with State standards);
5) Two layers 5/8-inch drywall direct nailed, 2-inch by 4-inch plate with 2-inch by 4-inch studs, 3 1/2-inch fiberglass insulation, 1-inch clear air space at plate, 2 -inch by 4-inch plate with 2-inch by 4-inch studs, two layers 5/8-inch direct nailed drywall (in compliance with State standards);
6) Same as #5 with two layers of 3 1/2-inch thick fiberglass insulation (in compliance with State standards).

NOI-5: Prior to issuance of building permits, a final report from a licensed acoustical engineer shall be submitted, verifying that interior and exterior area noise levels are within acceptable levels. In the event the noise is not mitigated to acceptable levels, additional mitigation measures shall be recommended by the noise specialist and implemented subject to the review and approval of the Director of Economic and Community Development.

NOI-6: For all construction related activities, noise attenuation techniques shall be employed as needed to ensure that noise remains as low as possible during construction. The following noise attenuation techniques shall be incorporated into contract specifications to reduce the impact of construction noise:

- Ensure that construction equipment will be equipped with properly operating and maintained mufflers consistent with manufacturers' standards.
- Place noise-generating construction equipment and locate construction staging areas away from sensitive receptors, where feasible.
- Schedule high noise-producing activities between the hours of 7:00 a.m. and 5:00 p.m. to minimize disruption to sensitive receptors.
- Implement noise attenuation measures to the extent feasible, which may include, but are not limited to, temporary noise barriers or noise blankets around stationary construction noise sources.
- Use electric air compressors and similar power tools rather than diesel equipment, where feasible.
- All stationary construction equipment (e.g. air compressor, generators, impact

wrenches, etc.) shall be operated as far away from residential uses as possible and shall be shielded with temporary sound barriers, sound aprons or sound skins.

- Construction-related equipment, including heavy-duty equipment, motor vehicles, and portable equipment, shall be turned off when not in use for more than 30 minutes.
- During all construction activities, the job superintendent shall limit all construction-related activities to between the hours 6:30 a.m. and 8:00 p.m. Monday through Saturday.
- Clearly post construction hours, allowable workdays, and the phone number of the job superintendent at all construction entrances to allow the surrounding property owners/occupants to contact the job superintendent. If the City or the job superintendent receives a complaint, the superintendent shall investigate, take appropriate corrective actions and report the actions to the complainant.

b) **Less than Significant Impact With Mitigation Incorporated**.

Construction

Vibration impacts from construction activities associated with the Proposed Project would be a function of the vibration generated by construction equipment, equipment location, sensitivity of nearby land uses, and the timing and duration of the construction activities. Nearest sensitive receptors consist of single-family residences located immediately north and east of the site. Single-family residences are also located south of the Proposed Project site across Rancho Vista Boulevard. Exposure to vibration can range from no perceptible effects at low levels, to rumbling sounds and detectable vibration at moderate levels, to slight damage at very high levels. Groundborne vibration levels decrease with distance. While the Proposed Project would generate vibration impacts during construction, construction would occur in conformance with PMC Section 8.28.030, which allows construction Monday through Saturday (excluding holidays) from 6:30 AM to 8:00 PM, which would limit the potential adverse effects of the Proposed Project. Implementation of the following mitigation measure for construction-related activities would reduce impacts to less than significant:

NOI-7: For all construction-related activities, noise attenuation techniques shall be employed, as appropriate, to reduce noise levels to the extent feasible during the construction phase. The following noise attenuation techniques shall be incorporated to reduce potential impacts of construction noise:

- Ensure that construction equipment is equipped with properly operating and maintained mufflers consistent with manufacturer's standards.

- Place noise-generating construction equipment and locate construction staging areas away from sensitive receptors, where feasible.
- Schedule high noise-producing activities between the hours of 7:00 a.m. and 5:00 p.m. to minimize disruption to sensitive receptors.
- Implement noise attenuation measures to the extent feasible, which may include, but are not limited to, temporary noise barriers or noise blankets around stationary construction noise sources.
- Use electric air compressors and similar power tools rather than diesel equipment, where feasible.
- All stationary construction equipment (e.g. air compressor, generators, impact wrenches, etc.) shall be operated as far away from residential uses as possible and shall be shielded with temporary sound barriers, sound aprons or sound skins.
- Construction-related equipment, including heavy-duty equipment, motor vehicles, and portable equipment, shall be turned off when not in use for more than 30 minutes.
- During all construction activities, the job superintendent shall limit all construction- related activities to between the hours 6:30 a.m. and 8:00 p.m. Monday through Saturday (excluding holidays).
- Clearly post construction hours, allowable workdays, and the phone number of the job superintendent at all construction entrances to allow the surrounding property owners/occupants to contact the job superintendent. If the City or the job superintendent receives a complaint, the superintendent shall investigate, take appropriate corrective actions and report the actions to the complainant.

In addition, the construction hours would occur during the daytime when the Proposed Project area is more active and has increased ambient noise. Impacts would be less than significant.

<u>Operation</u>

Once in operation, the Proposed Project would consist of daily residential activities. These activities are not anticipated to generate groundborne vibration that would be felt by the nearby residences. Impacts would be less than significant.

<u>Mitigation Measures</u>: No mitigation measures are necessary.

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

Project Impacts and Mitigation Measures

a) **Less than Significant Impact**. The proposed project would add 428 homes, as opposed to an estimate of 66 homes, given an existing zoning of R-1-20,000. The 428 homes could potentially add 1,549 residents, based on a 3.62 persons per household ratio (Department of Finance 2017). Despite the potential increase in housing and population, the level of growth associated with the project was anticipated in SCAG's long-term population forecasts and would not exceed regional population projections. Specifically, the increase of 428 units associated with the proposed project would represent an increase of approximately 2.6 percent of the approximate increase of 16,200 units projected for Palmdale through year 2040. This increase in housing units and population would not have a significant effect on any local or regional growth projections.

In addition, the project will increase density on a site currently dedicated to single-family housing. Increasing the density will help ensure that that the City of Palmdale meets its housing allocation needs as mandated by the Regional Housing Needs Assessment (RHNA). Furthermore, the site is located in a developed area largely surrounded by other urban residential homes and religious assembly uses, and a regional mall one-quarter mile to the east. The proposed project is adjacent to major arterial streets that can already or will be conditioned to have the capacity to accommodate added traffic volume. Therefore, the proposed project would not accelerate development in an undeveloped area, nor would build-out result in an adverse physical change in the environment or introduce unplanned infrastructure not previously evaluated by the City's General Plan. Impacts would be less than significant.

Mitigation Measures: No mitigation measures are necessary.

b) **No Impact**. The project site is currently vacant. No housing or people would be displaced necessitating the construction of replacement housing elsewhere. Therefore, no impact would occur.

Mitigation Measures: No mitigation measures are necessary.

	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
XV. PUBLIC SERVICES. 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 following public services:				
a) Fire protection?	☐	☐	☒	☐
b) Police protection?	☐	☐	☒	☐
c) Schools?	☐	☐	☒	☐
d) Parks?	☐	☐	☒	☐
e) Other public facilities?	☐	☐	☒	☐

Project Impacts and Mitigation Measures

a) **Less than Significant Impact**. The Los Angeles County Fire Department provides comprehensive emergency services for the City, including fire, rescue, and emergency medical (paramedic) services, as well as fire prevention functions. Los Angeles County Fire Station No. 24, located at 1050 Rancho Vista Boulevard, approximately 0.7 miles east of the project site, would serve as the first responder in the event of an emergency. Given that the proposed project would generate up to an estimated 1,549 new residents to the City (DOF 2017), the proposed project could potentially increase the demand for Fire Department services. This increase of people would be within regional growth projections for the City and thus, would not substantially affect the provision of fire protection given the location of the proposed project in an urbanized area and close proximity to existing fire stations. Furthermore, compliance with more current applicable fire code and building code provisions determines a project's impact on fire services. The proposed project would be required to meet all current code provisions to the satisfaction of the City and Fire Department. As a result, the proposed project would be adequately served by existing public services and would not necessitate the provision of new or physically altered governmental facilities, and is therefore not anticipated to result in substantial adverse impacts. The overall need for fire protection services is not expected to substantially increase. Impacts would be less than significant.

<u>Mitigation Measures</u>: No mitigation measures are necessary.

b) **Less than Significant Impact**. The Los Angeles Sheriff's Department provides police protection services to the project site from its station at 750 East Avenue Q, approximately 3 miles to the east of the project site. The proposed project would generate up to an estimate of 1,549 residents to the City (DOF 2017). This increase of people would be within regional growth projections for the City and thus, would not substantially affect provision of police protection given the location of the proposed project in an urbanized area and its proximity to existing police protection services and patrol routes. As such, the proposed project would not result in a need for new or physically altered governmental facilities. The overall need for police protection services would not increase substantially as a result of the proposed project.

<u>Mitigation Measures</u>: No mitigation measures are necessary.

c) **Less than Significant Impact**. The project area is currently served by Palmdale School District and Antelope Valley Union High School District and the following nearby schools: Summerwind Elementary, David G. Millen Intermediate, and Highland High School. The proposed project is anticipated to generate an increase in students; however, the project applicant would be required to pay the applicable school facility fees to the school districts based on a current fee schedule for new residential construction prior to the issuance of building permits to provide funds to ensure adequate school facilities are available. Pursuant to Government Code 65996, payment of school fees constitutes the exclusive means of both "considering" and "mitigating" impacts on school facilities. As such, compliance with this statutory requirement would result in less than significant impacts.

<u>Mitigation Measures</u>: No mitigation measures are necessary.

d) **Less than Significant Impact**. The proposed project would create housing for up to 1,549 residents within the City (DOF 2017). The proposed project, including the triplexes and the apartment complex, would provide on-site recreational amenities and open spaces areas, including picnic and barbeque areas, open grass areas for recreation, a swimming pool, basketball court, clubhouse, tot lot and dog park. However, it is reasonable to assume that the future residents of the proposed project would utilize recreation and park facilities in the surrounding area. Any additional demand would be met through payment of the City's park fees to provide funding for park and recreation facilities. Thus, recreation facility impacts would be less than significant.

Mitigation Measures: No mitigation measures are necessary.

e) **Less than Significant Impact.** The proposed project would not create any significant increase in demand for library services. In accordance with the requirements of the City's Municipal Code, the project applicant would be required to pay the City's public facilities fee to finance the City's public facilities, including libraries. Payment of the impact fee would result in a less than significant impact to library facilities.

Mitigation Measures: No mitigation measures are necessary.

	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
XVI. RECREATION				
a) Would the project increase the use of existing neighborhood or regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	☐	☐	☒	☐
b) Would the project increase the use of existing neighborhood or regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	☐	☐	☐	☒

Project Impacts and Mitigation Measures

a) **Less than Significant Impact**. The nearest park to the Project site is Marie Kerr Park which is located approximately 1 mile west of the Proposed Project site. The new residents could potentially use the facilities at Marie Kerr Park which could result in physical deterioration. The Proposed Project does include outdoor recreational facilities for the residents. The facilities include a dog park, hammock farms, bbq and picnic areas, putting green, basketball court, tot lot, clubhouse and pool. These facilities would not be available to the general public and would only be available to residents or guests of the residents. Due to the distance between the Proposed Project and Marie Kerr Park, and because of the availability of recreational facilities within the Proposed Project, impacts would be less than significant. In addition, the Proposed Project would be required to pay development impact fees for parks and other public facilities for the upkeep of existing facilities or for the construction of new public facilities. The payment of development impact fees will ensure that park and public facilities will be adequate to serve new growth. Impacts will be less than significant.

Mitigation Measures: No mitigation measures are necessary.

b) **No Impact.** The Proposed Project does not include the development of recreational facilities for public use or require expansion of existing recreational facilities since the residents will have recreational facilities provided on-site. The facilities include a dog park, hammock farms, bbq and picnic areas, putting green, basketball court, tot lot, clubhouse and pool. All recreational facilities constructed would be limited to resident use only. As stated in the previous Section XVI(a), the Proposed Project will be required to pay development impact fees for parks and other public facilities to ensure that parks and public facilities will be adequate to service new growth to the area. No impact would occur.

Mitigation Measures: No mitigation measures are necessary.

	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
XVII. TRANSPORTATION. **Would the Project:**				
a) Conflict with a program plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?	☐	☐	☒	☐
b) Would the project conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision(b)?	☐	☐	☒	☐
c) Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g. farm equipment)?	☐	☐	☒	☐
d) Result in inadequate emergency access?	☐	☐	☒	☐

The following descriptions are based upon the 20th Street West Traffic Impact Study prepared by Integrated Engineering Group in February 2018 (Appendix G).

Project Impacts and Mitigation Measures

a) **Less than Significant Impact**.

<u>Project Trip Generation</u>
Trip generation factors were obtained from the Institute of Transportation Engineers (ITE) Trip Generation manual, 10th Edition. The Traffic Impact Study summarizes the estimated trip generation for the Proposed Project site during the AM (7-9 AM) peak

and PM (4-6 PM) peak periods. The Proposed Project is anticipated to generate 3,230 total daily trips, 212 trips during the AM peak hours, and 264 trips during the PM peak hours.

Existing Conditions
Currently, the Proposed Project site is vacant and undeveloped land. Primary access to the project will be from two driveways, one along 20th Street West and one along Rancho Vista Boulevard. All intersections analyzed under existing conditions are determined to be operating at an acceptable level of service (LOS C or better).

Existing Plus Project Buildout
The study intersections under Existing plus Project Buildout indicates that two intersections, Rancho Vista Boulevard/10th Street West and 10th Street West/State Route 14 Southbound Off-ramp will operate at an LOS F. Project related impacts at Rancho Vista Boulevard/10th Street West and 10th Street West/State Route 14 Southbound Off-ramp intersections will be fully mitigated with the proposed 10th Street West widening project that is currently under construction by the City. Delays and LOS at these intersections will be improved to operation levels equal or better than the ones under Buildout (2040) Without Project conditions.

In addition, the Proposed Project would not include activities that would remove access to bicycle lanes and pedestrian paths and would not conflict with a congestion management or circulation plan. Impacts would be less than significant.

b) **Less than Significant Impact**. CEQA Guidelines Section 15064.3 provides consideration whether a project's vehicle miles traveled may result in a significant impact. Projects that are located within one half mile of transit, or nearby existing transit stops would be considered less than significant. The Proposed Project is located at the northeast corner of Rancho Vista Boulevard and 20th Street West which has designated public transportation stops provided by the Antelope Valley Transit Authority (AVTA 2019). The closest bus stop is adjacent to the southern boundary of the site, at the intersection of Dunbar Street and Rancho Vista Boulevard. Therefore, impacts would be less than significant.

c) **Less than Significant Impact**. The Proposed Project would not result in hazards due to a geometric design feature or incompatible uses, as the Project does not include any substantial changes to the existing roadway network. New structures associated with the Proposed Project would be constructed consistent with relevant building and fire codes, including access requirements into and out of the Project site. Implementation of the Proposed Project would result in a less than significant impact.

Mitigation Measures: No mitigation measures are necessary.

d) **Less than Significant Impact**. The Proposed Project site is bordered by arterial streets. A traffic control plan will be implemented during construction to minimize disruptions due to lane closures and to maintain access for emergency response and evacuation. New structures associated with the Proposed Project would be constructed consistent with relevant building and fire codes, including access requirements into and out of the Project site. As described in Section XVII(a) above, the Proposed Project would not reduce traffic LOS below acceptable levels, and consequently, would not block or interfere with emergency and evacuation routes. Therefore, the Proposed Project would not result in inadequate emergency access, and impacts would be less than significant.

Mitigation Measures: No mitigation measures are necessary.

	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
XVIII. TRIBAL CULTURAL RESOURCES. Would the Project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code Section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:				
a) Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code Section 5020.1(k), or	☐	☒	☐	☐
b) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) to Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resource Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.	☐	☒	☐	☐

Project Impacts and Mitigation Measures

a-b) **Less than Significant Impact with Mitigation Incorporated**. As described above in Section V(a), no historical resources exist within or adjacent to the Project site and thus the Proposed Project will not cause a substantial adverse change to any known historical resources.

On June 4, 2018, the City submitted Assembly Bill 52 (AB 52) notification letters to four Native American tribal governments or designated tribal representatives. These tribes were the San Gabriel Band of Mission Indians, Gabrieleño Band of Mission Indians – Kizh Nation, San Manuel Band of Mission Indians, and the Fernandeño Tataviam Band of Mission Indians. Of the four tribes or tribal representatives, the City received responses and consultation requests from two tribes:

Fernandeño Tataviam Band of Mission Indians (July 6, 2018): The tribe responded within the 30-day timeframe. While there were no recorded archaeological sites within the boundaries of the Proposed Project, the tribe would like to consult if and when cultural resources are encountered during excavation. As such, with the incorporation of Mitigation Measure **TCR-1**, impacts would be reduced to less than significant.

San Manuel Band of Mission Indians (July 5, 2018): The tribe responded within the 30-day timeframe. While there were no recorded archaeological sites within the boundaries of the Proposed Project, the tribe is requesting additional archeological fieldwork since the project site is an area of concern. As such, with the incorporation of Mitigation Measure **TCR-1** and **TCR-2**, impacts would be reduced to less than significant.

Mitigation Measures:

TCR-1: If a pre-contact cultural resource is discovered during project implementation, ground disturbing activities shall be suspended 60 feet around the resource(s) and an Environmentally Sensitive Area (ESA) physical demarcation/barrier constructed. A research design shall be developed by the archaeologist that shall include a plan to evaluate the resource for significance under CEQA criteria. Representatives from the San Manuel Band of Mission Indians Cultural Resources Department (SMBMI), the Fernandeño Tataviam Band of Mission Indians, the archaeologist/applicant, and the Lead Agency shall confer regarding the research design, as well as any testing efforts needed to delineate the resource boundary. Following the completion of evaluation efforts, all parties shall confer regarding the archaeological significance of the resource, its potential as a Tribal Cultural Resource (TCR), and avoidance (or other appropriate treatment) of the discovered resource.

Should any significant resource and/or TCR not be a candidate for avoidance or preservation in place, and the removal of the resource(s) is necessary to mitigate impacts, the research design shall include a comprehensive discussion of sampling strategies, resource processing, analysis, and reporting protocols/obligations. Removal of any cultural resource(s) shall be conducted with the presence of a Tribal monitor representing the Tribes, unless otherwise decided by SMBMI or the Fernandeño Tataviam Band of Mission Indians (collectively, Tribes). All plans for analysis shall be reviewed and approved by the applicant and the Tribes prior to implementation, and all removed material shall be temporarily curated on-site. It is the preference of the Tribes that removed cultural material be reburied as close to the original find location as possible. However, should reburial within/near the original find location during project implementation not be feasible, then a reburial location for future reburial shall be decided upon by the Tribes, the landowner, and the Lead Agency, and all finds shall be reburied within this location. Additionally, in this case, reburial shall not occur until all ground-disturbing activities associated with the project have been completed, all monitoring has ceased, all cataloguing and basic recordation of cultural resources have been completed, and a final monitoring report has been issued to the Lead Agency, CHRIS, SMBMI and the Fernandeño Tataviam Band of Mission Indians. All reburials are subject to a reburial agreement that shall be developed between the landowner and the Tribes outlining the determined reburial process/location, and shall include measures and provisions to protect the reburial area from any future impacts (vis a vis project plans, conservation/preservation easements, etc.).

Should it occur that avoidance, preservation in place, and on-site reburial are not an option for treatment, the landowner shall relinquish all ownership and rights to this material and confer with the Tribes to identify an American Association of Museums (AAM)-accredited facility within the County that can accession the materials into their permanent collections and provide for the proper care of these objects in accordance with the 1993 CA Curation Guidelines. A curation agreement with an appropriate qualified repository shall be developed between the landowner and museum that legally and physically transfers the collections and associated records to the facility. This agreement shall stipulate the payment of fees necessary for permanent curation of the collections and associated records and the obligation of the Project developer/applicant to pay for those fees.

All draft records/reports containing the significance and treatment findings and data recovery results shall be prepared by the archaeologist and submitted to the Lead Agency and the Tribes for their review and comment. After approval from all parties, the final reports and site/isolate records are to be submitted to the local CHRIS Information Center, the Lead Agency, SMBMI and the Fernandeño Tataviam Band of Mission Indians.

TCR-2: In the event that any human remains are discovered within the project area, ground disturbing activities shall be suspended 100 feet around the resource(s) and an Environmentally Sensitive Area (ESA) physical demarcation/barrier constructed. The on-site lead/foreman shall then immediately notify SMBMI, the Fernandeño Band of Mission Indians, the applicant/developer, and the Lead Agency. The Lead Agency and the applicant/developer shall then immediately contact the County Coroner regarding the discovery. If the Coroner recognizes the human remains to be those of a Native American, or has reason to believe that they are those of a Native American, the Coroner shall ensure that notification is provided to the NAHC within 24 hours of the determination, as required by California Health and Safety Code § 7050.5 (c). The NAHC-identified Most Likely Descendant (MLD), shall be allowed, under California Public Resources Code § 5097.98 (a), to (1) inspect the site of the discovery and (2) make determinations as to how the human remains and funerary objects shall be treated and disposed of with appropriate dignity. The MLD, Lead Agency, and landowner agree to discuss in good faith what constitutes "appropriate dignity" as that term is used in the applicable statutes. The MLD shall complete its inspection and make recommendations within 48 hours of the site visit, as required by California Public Resources Code § 5097.98.

Reburial of human remains and/or funerary objects (those artifacts associated with any human remains or funerary rites) shall be accomplished in compliance with the California Public Resources Code § 5097.98 (a) and (b). The MLD in consultation with the land owner, shall make the final discretionary determination regarding the appropriate disposition and treatment of human remains and funerary objects. All parties are aware that the MLD may wish to rebury the human remains and associated funerary objects on or near the site of their discovery, in an area that shall not be subject to future subsurface disturbances. The applicant/developer/landowner shall accommodate on-site reburial in a location mutually agreed upon by the Parties.

It is understood by all Parties that unless otherwise required by law, the site of any reburial of Native American human remains or cultural artifacts shall not be disclosed and shall not be governed by public disclosure requirements of the California Public Records Act. The Coroner, parties, and Lead Agency, will be asked to withhold public disclosure information related to such reburial, pursuant to the specific exemption set forth in California Government Code § 6254 (r).

	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
XIX. UTILITIES AND SERVICE SYSTEMS. Would the Project:				
a) Require or result in relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?	☐	☐	☒	☐
b) Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years?	☐	☐	☒	☐
c) Result in 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?	☐	☐	☒	☐
d) Generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?	☐	☐	☒	☐
e) Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?	☐	☐	☒	☐

Project Impacts and Mitigation Measures

a) **Less than Significant Impact**. The Proposed Project will require installation of new utility services such as electric, gas, water, telecommunications, and drainage since the existing Project site is currently vacant. The Proposed Project is not located above a hazardous materials site or a groundwater resource. The Proposed Project will receive adequate services for wastewater treatment and would not require the construction of new or expanded facilities. Impacts would be less than significant.

<u>Mitigation Measures</u>: No mitigation measures are necessary.

b) **Less than Significant Impact**. The City is served by the Los Angeles County Sanitation District, Palmdale Water district, and a number of local mutual water companies. The Proposed Project will be serviced by Los Angeles County Waterworks District No. 40. According to the Urban Water Management Plan prepared for District 40, the District has adequate water supplies to meet projected demands in all types of water years from normal to multiple-dry years, and therefore has adequate supplies to provide services to the Proposed Project. The Proposed Project would also use low flow fixtures that would reduce water consumption and decrease wastewater discharges. Impacts would, therefore, be less than significant.

Mitigation Measures: No mitigation measures are necessary.

c) **Less than Significant Impact.** According to the letter received from the County Sanitation Districts of Los Angeles County, dated May 2, 2018, the proposed project would discharge to a local sewer line not maintained by the County Sanitation Districts of Los Angeles County (Districts), for conveyance to the Districts' Trunk "C" Relief Trunk Sewer, located in 10th Street West at Rancho Vista Boulevard. The Districts' 12-inch diameter trunk sewer has a capacity of 8.7 million gallons per day (mgd) and conveyed a peak flow of 1.1 mdg when last measured in 2017. Project wastewater would be treated at the Palmdale Water Reclamation Plant, which has a capacity of 12 million gallons of wastewater per day (mgd). The proposed 428 unit Planned Development, is anticipated to generate approximately 56,160 gallons per day of wastewater, which would be 0.46% of the capacity of the water reclamation plant.

The proposed project site is located within the boundaries of County Sanitation Districts of Los Angeles County (Districts). Copies of the proposed project plans were provided to the Districts for review and comment. The City of Palmdale General Plan policies require that any water infrastructure necessary to serve the site be financed and constructed by the project. According to the letter received from the County Sanitation District of Los Angeles County, dated May 2, 2018, the Districts present system capacity and planned improvement projects, sufficient water facilities are available to serve the project and the construction of new facilities or the expansion of existing facilities, except as required to support the project itself, will not be required.

The proposed project will be required to construct the necessary on-site infrastructure and sewer connections to the existing system and pay any applicable fees as required by the City of Palmdale. Therefore, given the existing capacity of the wastewater treatment plant and compliance with PMC requirements, there will be a less than significant impact. No mitigation is required.

Mitigation Measures: No mitigation measures are necessary.

d) **Less than Significant Impact**. The AB 32 Scoping Plan written in 2008 provided the process of identifying ways to achieve GHG reductions from the Waste Management sector such as controlling landfill methane emissions as one of the early action measures. The 2008 Scoping Plan also included mandatory recycling, reuse and remanufacturing of recovered materials, composting, and other alternatives to using landfills.

The Antelope Valley region's waste and recycling collection services are provided by the Waste Management Inc. Antelope Valley Public Landfill receives the waste generated by the City. The remaining capacity of Antelope Valley Landfill is estimated at 12.9 million tons and the landfill has a remaining life of 20 years as of 2016 according to the Los Angeles Integrated Waste Management Plan (County of Los Angeles 2016). The Proposed Project's construction and operational wastes would be diverted to recycling facilities or made available for reuse when appropriate to reduce waste. The Proposed Project will comply with AB 32 and the City's General Plan Policy ER5.5.2 to require citizens and businesses to recycle to the extent possible, and comply with the Solid Waste Management Plan (SWMP) (City of Palmdale 1993). Impacts would be less than significant.

Mitigation Measures: No mitigation measures are necessary.

e) **Less than Significant Impact**. The Proposed Project will comply with AB 32 and the City's General Plan goals and policies for reduction of waste and implementing recycling standards so that facilities and programs could accommodate solid waste disposal. Impacts would be less than significant.

Mitigation Measures: No mitigation measures are necessary.

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

Project Impacts and Mitigation Measures

a) **Less than Significant Impact**. The Proposed Project site is not located within a Very High Fire Hazard Severity Zone (CAL FIRE 2012). Rancho Vista Boulevard is identified as an evacuation route according to the City General Plan Exhibit S-1 (City of Palmdale 1993). However, implementation of the Proposed Project would not result in substantial impacts to this roadway because the Proposed Project does not include any road closures or maintenance activities that will significantly impair an emergency response plan or emergency evacuation plan. Additionally, the Proposed Project would comply with Los Angeles County Fire Department requirements regarding emergency vehicle access to the Proposed Project site. Therefore, implementation of the Proposed Project would not result in an impact associated with an emergency evacuation plan within or near a state responsibility area or land classified as Very High Fire Hazard Severity Zone. Therefore, the impacts would be less than significant.

Mitigation Measures: No mitigation measures are necessary.

b) **No Impact**. The Proposed Project site is not located in an area identified as a Very

High Fire Hazard Severity Zone (CAL FIRE 2012). Additionally, the Proposed Project site is an infill development, on a site that is relatively flat and devoid of significant amounts of vegetation that could increase fire risk. No impact would occur.

Mitigation Measures: No mitigation measures are necessary.

c) **No Impact**. The Proposed Project site is not located in an area identified as a Very High Fire Hazard Severity Zone (CAL FIRE 2012). Additionally, the Proposed Project is an infill development, on a site that is devoid of significant amounts of vegetation that could increase fire risk, and does not require the installation of any infrastructure to reduce the risk associated with wild fires. No impact would occur.

Mitigation Measures: No mitigation measures are necessary.

d) **No Impact**. The Proposed Project site is not located in an area identified as a Very High Fire Hazard Severity Zone (CAL FIRE 2012). Additionally, the Proposed Project site is relatively flat and is not susceptible to post fire drainage and/or slope issues. The Proposed Project is an infill development and devoid of significant amounts of vegetation No impact would occur.

Mitigation Measures: No mitigation measures are necessary.

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

The following are Mandatory Findings of Significance in accordance with Section 15065 of the CEQA Guidelines.

a) **Less than Significant Impact with Mitigation Incorporated**. The Proposed Project consists of highly disturbed desert scrub habitat and does not contain any wetlands, desert washes, or riparian habitats; and the general area continues to become degraded and fragmented and lacks suitable habitats.

As discussed in Section III, burrowing owls are considered a species of special concern by the CDFW. While none were identified to be within the Proposed Project area, the burrows of the California ground squirrel can provide potential cover sites for burrowing owls and, as a result, may result in the potential presence of burrowing owls. Implementation of **BIO-1** will reduce impacts to burrowing owls to less than significant.

The Proposed Project will not have a substantial adverse effect on state or federally listed wildlife due to the disturbed conditions of the property. Any potential impacts to burrowing owls would be mitigated through a burrowing owl survey prior to ground-disturbing activities to ensure that no owls would be within the Proposed

Project site. According to the Biological Resources Assessment, the vegetation within the study area provides potential nesting sites for birds. Implementation of **BIO-3** will reduce impacts to migratory birds and active nests to a less than significant level.

The Proposed Project site also contains a total of 67 Joshua trees that were identified during the line transect survey. The Proposed Project will comply with the City's ordinance for a two year maintenance program and transplantation of Joshua trees.

The Proposed Project site does not contain any recorded archaeological resources, historical resources, and no identified Native American cultural resources. Amargosa Creek runs approximately 0.3 miles to the south of the Project area. Citing the substantial depth at which prehistoric cultural remains had been discovered in the past, subsurface archaeological testing is required through Mitigation Measure **CUL-1** to ensure appropriate levels of effort in the identification of all Native American cultural resources. If any buried cultural materials are encountered during earth-moving operations associated with the Project, all work in that area will be halted or diverted until a qualified archaeologist or paleontologist can evaluate the nature and significance of the finds.

With the implementation of mitigation measures and compliance with the PMC the Proposed Project will have a less than significant impact.

b) **Less than Significant Impact.** The following projects have been identified to be located near the Proposed Project area and that could occur within the same timeframe according to the City of Palmdale 2018 Ten-Year Capital Improvement Plan (City of Palmdale 2018):

- STR-042: Rancho Vista Boulevard Widening and Side Gap Closure;
- TRF-044: Traffic Signal Modification – Rancho Vista Boulevard at 15th Street West;
- WSR-35: Rancho Vista Boulevard Sewer Upgrade: 25th Street West to 10th Street West; and,
- Development Project: GPA 19-001, ZC 19-001, TTM 82636, PD 19-001, CUP 19-002 and SPR 19-003 located at the northwest corner of Rancho Vista Boulevard and 15th Street West.

No other projects have been identified to begin within the timeframe of the Proposed Project except for STR-042 and the Fairfield Inn hotel (as discussed within Appendix G) project. STR-042 will occur along Rancho Vista Boulevard and up to 15th Street West. The Fairfield Inn hotel project will be located along

Avenue O-8, north of SR-14, approximately 1 mile east from the Proposed Project. While there are potential impacts that could occur with these projects occurring simultaneously such as accessing 20th Street West and Rancho Vista Boulevard, which are frequently accessed roadways, the results of the Traffic Analysis indicates that impacts would be less than significant. In addition, the Proposed Project will coordinate with the City to ensure that potential impacts would not be cumulatively considerable such as compliance and coordination to ensure traffic control plans for multiple projects are consistent with each other. Impacts would be less than significant.

c) **Less than Significant Impact with Mitigation Incorporated**. The Proposed Project could have the potential to impact humans during construction of the residential facilities with regard to potential exposure to emissions, hazardous materials, noise, and traffic. However, with the implementation of project BMPs, substantial adverse impacts would be minimized during construction and operation of the Proposed Project. The implementation of mitigation measures **NOI-1** through **NOI-7** would reduce impacts to a less than significant level.

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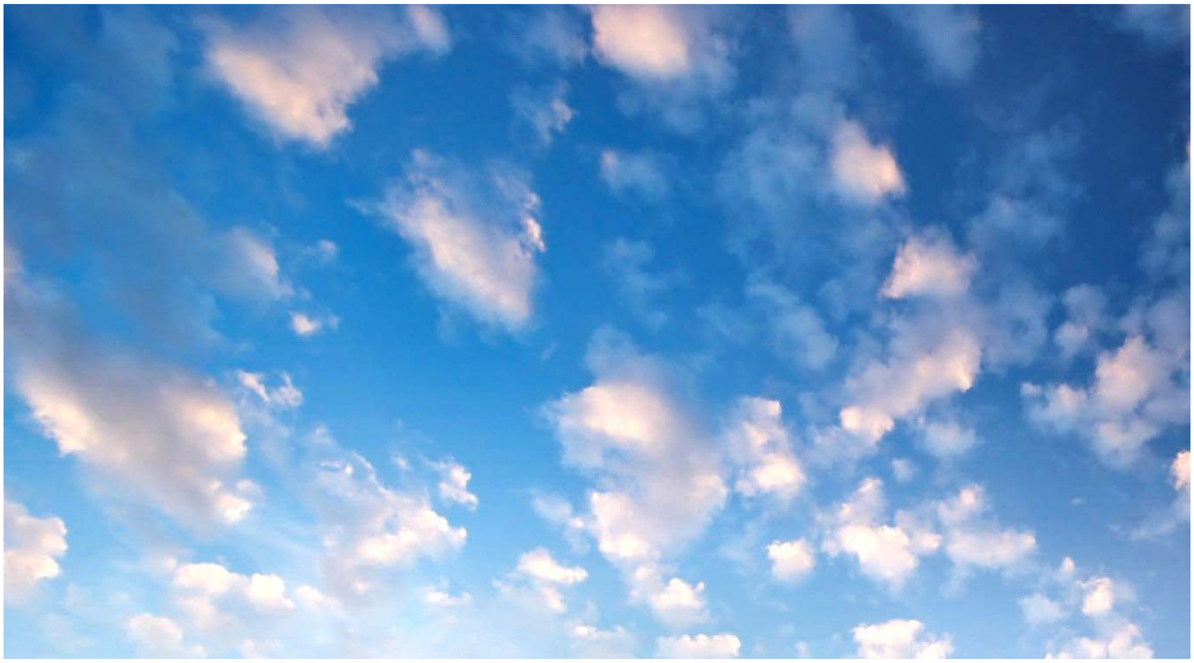
APPENDIX: A



20th Street West and Rancho Vista Boulevard Project

Air Quality and Greenhouse Gas Study

prepared for

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Appendix A CalEEMod Air Quality and Greenhouse Gas Modeling Results

1 Project Description

1.1 Introduction

This study analyzes the potential air quality and greenhouse gas (GHG) emissions impacts of the proposed 20th Street West and Rancho Vista Boulevard Residential Project (project) in Palmdale, California. Rincon Consultants, Inc. prepared this study under contract to Cage Palmdale, LLC, for use by the City of Palmdale, in support of the environmental documentation being prepared pursuant to the California Environmental Quality Act (CEQA). The purpose of this study is to analyze the project's air quality and GHG impacts related to both temporary construction activity and long-term operation of the project.

1.2 Project Description

The project site encompasses approximately 32.8 acres, located at the northeast corner of the intersection of 20th Street West and Rancho Vista Boulevard in the City of Palmdale, California. The site is bordered by single family residences to the east, West Avenue O-12 and single family residences to the north, West Rancho Vista Boulevard and single family residences to the south, and 20th Street West and a church to the west. The project would be developed on a currently vacant site.

The project would involve the construction of single family units as well as multi-family triplex and apartment units. The triplex units would be constructed in 20, two-story buildings while the apartments would be constructed in 19 two-story buildings. In total, the single family component of the project would include 48 units and cover approximately 9.4 acres of the site. The single family residences would include two garage parking spaces as well as two driveway parking spaces for each unit with eight additional guest parking spaces for a total of 200 parking spaces. The multi-family triplex component of the project would include construction of 60 units on approximately 5.1 acres of the site. The triplex component would also include 212 vehicular parking spaces, 100 of which would be driveway parking spaces, 100 of which would be garage parking spaces, and 12 of which would be guest parking spaces. The apartment component of the project would include constructing 320 units on 18.2 acres. There would be a total of 112 one-bedroom units, 168 two-bedroom units, and 40 three-bedroom units. Additionally, the apartment component of the project would include 627 total parking spaces, 587 of which would be surface parking spaces, while the remaining 40 spaces would be located in garages. The primary project components are summarized in Table 1.

Table 1 Summary of Project Components

Residential Unit Type	Number of Units	Vehicular Parking Spaces	Acreage[1]	Usable Open Space (sf)[2]
Single Family Residences	48	200	9.4	9,300
Multi-family Triplex	60	212	5.1	28,975
Apartments	320	627	18.2	95,070
Total	428	1,039	32.8	133,345

[1] Acreage is from the site plans and was updated in CalEEMod to reflect the approximate building lot coverage.

[2] Usable open space was input into CalEEMod as a "City Park" land use to reflect the use of resources, such as water, as well as the associated emissions that would be required to construct that component of the project and maintain it over time. However, it was assumed that no additional trips would be associated with the City Park land use because the open space would be used by residents onsite.

Note: Totals may not add up due to rounding

As part of the apartment component of the project, there would be picnic and barbeque areas, hammock farms, which provide a place to set up hammocks and relax, open grass areas for recreation, a swimming pool,[1] basketball court, clubhouse,[2] putting green, tot lot, and dog park. There would be no wood burning fire places included in the project.

[1] It was assumed that the swimming pool would be approximately 800 square feet.
[2] It was assumed that the clubhouse would be approximately 250 square feet.

2 Air Quality

2.1 Background

Local Climate and Meteorology

The project site is located in the City of Palmdale, which is situated in the Antelope Valley portion of the Mojave Desert Air Basin (MDAB). Antelope Valley and the MDAB are disconnected from the Southern California coastal and Central California valley regions by the Tehachapi Mountains to the northwest and by the San Gabriel Mountains to the south. Air quality management in the Antelope Valley is under jurisdiction of the Antelope Valley Air Quality Management District (AVAQMD). The AVAQMD jurisdiction spans the western portion of the MDAB and encompasses the incorporated cities of Lancaster and Palmdale, Air Force Plant 42, and the southern portion of Edwards Air Force Base (AVAQMD 2016). The MDAB is located in a mountain range that is divided by long, broad valleys, some of which have dry lakes. The mountains in the lower region generally reach heights of up to 1,000 to 4,000 feet above the valley floor. Prevailing winds in the MDAB come from the west and southwest and are due to a combination of the proximity of MDAB to coastal and central regions as well as the location of the Sierra Nevada Mountains to the north which prevent air from passing through.

During summer, the MDAB is normally influenced by the Pacific Subtropical High cell off of the coast that prevents cloud formation and encourages daytime solar heating. Cold air masses moving south from Canada and Alaska do not generally influence the MDAB because the frontal systems are weak and diffuse before they reach the desert. Therefore, desert moisture comes in the form of warm, moist, unstable air masses from the south and the MDAB averages three to seven inches of rain annually. As such, it is classified as a dry-hot desert climate, with portions classified as a dry-very hot desert, which means that at least three months have maximum average temperatures over 100.4 degrees Fahrenheit (AVAQMD 2016).

Air Quality Regulation

The federal and state governments have established ambient air quality standards for the protection of public health. The United States Environmental Protection Agency (U.S. EPA) is the federal agency designated to administer air quality regulation, while the California Air Resources Board (ARB) is the State equivalent in the California Environmental Protection Agency (CalEPA). County-level Air Pollution Control Districts (APCDs) provide local management of air quality. The ARB has established air quality standards and is responsible for the control of mobile emission sources, while the local APCDs are responsible for enforcing standards and regulating stationary sources. The ARB has established 14 air basins statewide.

The U.S. EPA has set primary national ambient air quality standards (NAAQS) for ozone (O_3), carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), particulate matter less than 10 microns in diameter(PM_{10}), particulate matter less than 2.5 microns ($PM_{2.5}$), and lead (Pb). Primary standards are those levels of air quality deemed necessary, with an adequate margin of safety, to protect public health. In addition, the State of California has established health-based ambient air quality standards for these and other pollutants, some of which are more stringent than the federal standards. Table 2 lists the current federal and State standards for regulated pollutants.

The MDAB within the AVAQMD has been designated as nonattainment for the federal and State 8-hour O_3 standards, and the State PM_{10} standard. This area is unclassified or in attainment for the federal and State standards for CO; the federal standard for PM_{10}; and the federal and State standards for $PM_{2.5}$. The MDAB within the AVAQMD is in attainment of all other federal and State standards. The federal and State ambient air quality standards are described in Table 2 below.

Table 2 Federal and State Ambient Air Quality Standards

Pollutant	Averaging Time	Federal Primary Standards	California Standard
Ozone	1-Hour	–	0.09 ppm
	8-Hour	0.070 ppm	0.070 ppm
Carbon Monoxide	8-Hour	9.0 ppm	9.0 ppm
	1-Hour	35.0 ppm	20.0 ppm
Nitrogen Dioxide	Annual	0.053 ppm	0.030 ppm
	1-Hour	0.100 ppm	0.18 ppm
Sulfur Dioxide	Annual	–	–
	24-Hour	–	0.04 ppm
	1-Hour	0.075 ppm	0.25 ppm
PM_{10}	Annual	–	20 $\mu g/m^3$
	24-Hour	150 $\mu g/m^3$	50 $\mu g/m^3$
PM_{25}	Annual	12 $\mu g/m^3$	12 $\mu g/m^3$
	24-Hour	35 $\mu g/m^3$	–
Lead	30-Day Average	–	1.5 $\mu g/m^3$
	3-Month Average	0.15 $\mu g/m^3$	–

ppm = parts per million

$\mu g/m^3$ = micrograms per cubic meter

Source: Ambient Air Quality Standards (ARB 2016)

Ozone

Ozone is produced by a photochemical reaction (triggered by sunlight) between nitrogen oxides (NO_X) and reactive organic gases (ROG).[3] NO_X is formed during the combustion of fuels, while reactive organic gases are formed during combustion and evaporation of organic solvents. Because O_3 requires sunlight to form, it mostly occurs in substantial concentrations between the months of April and October. Ozone is a pungent, colorless, toxic gas with direct health effects on humans

[3] Organic compound precursors of ozone are routinely described by a number of variations of three terms: hydrocarbons (HC), organic gases (OG), and organic compounds (OC). These terms are often modified by adjectives such as total, reactive, or volatile, and result in a rather confusing array of acronyms: HC, THC (total hydrocarbons), RHC (reactive hydrocarbons), TOG (total organic gases), ROG (reactive organic gases), TOC (total organic compounds), ROC (reactive organic compounds), and VOC (volatile organic compounds). While most of these differ in some significant way from a chemical perspective, from an air quality perspective two groups are important: non-photochemically reactive in the lower atmosphere, or photochemically reactive in the lower atmosphere (HC, RHC, ROG, ROC, and VOC). SCAQMD uses the term VOC to denote organic precursors.

including respiratory and eye irritation and possible changes in lung functions. Groups most sensitive to O_3 include children, the elderly, people with respiratory disorders, and people who exercise strenuously outdoors.

Carbon Monoxide

CO is a local pollutant that is found in high concentrations only near fuel combustion equipment and other sources of CO. The primary source of CO, a colorless, odorless, poisonous gas, is automobile traffic. Elevated concentrations, therefore, are usually only found near areas of high traffic volumes. CO's health effects are related to its affinity for hemoglobin in the blood. At high concentrations, CO reduces the amount of oxygen in the blood, causing heart difficulty in people with chronic diseases, reduced lung capacity, and impaired mental abilities.

Nitrogen Dioxide

NO_2 is a by-product of fuel combustion, with the primary source being motor vehicles and industrial boilers and furnaces. The principal form of nitrogen oxide produced by combustion is nitric oxide (NO), but NO reacts rapidly to form NO_2, creating the mixture of NO and NO_2 commonly called NO_X. Nitrogen dioxide is an acute irritant. A relationship between NO_2 and chronic pulmonary fibrosis may exist, and an increase in bronchitis in young children at concentrations below 0.3 parts per million (ppm) may occur. NO_2 absorbs blue light and causes a reddish brown cast to the atmosphere and reduced visibility. It can also contribute to the formation of ozone/smog and acid rain.

Suspended Particulates

Atmospheric particulate matter is comprised of finely divided solids and liquids such as dust, soot, aerosols, fumes, and mists. The particulates that are of particular concern are PM_{10} (which measures no more than 10 microns in diameter) and $PM_{2.5}$, (a fine particulate measuring no more than 2.5 microns in diameter). The characteristics, sources, and potential health effects associated with the small particulates (PM_{10} and $PM_{2.5}$) and $PM_{2.5}$ can be different. Major man-made sources of PM_{10} are agricultural operations, industrial processes, combustion of fossil fuels, construction, demolition operations, and entrainment of road dust into the atmosphere. Natural sources include windblown dust, wildfire smoke, and sea spray salt. The finer, $PM_{2.5}$ particulates are generally associated with combustion processes as well as being formed in the atmosphere as a secondary pollutant through chemical reactions. $PM_{2.5}$ is more likely to penetrate deeply into the lungs and poses a serious health threat to all groups, but particularly to the elderly, children, and those with respiratory problems. More than half of the small and fine particulate matter that is inhaled into the lungs remains there, which can cause permanent lung damage. These materials can damage health by interfering with the body's mechanisms for clearing the respiratory tract or by acting as carriers of an absorbed toxic substance.

Current Air Quality

The AVAQMD operates one air quality monitoring station (Lancaster-43301 Division Street monitoring station) in the MDAB. The purpose of the monitoring station is to measure ambient concentrations of pollutants and determine whether ambient air quality meets the California and federal standards. The monitoring station is located at 43301 Division Street, approximately 4.8 miles northeast of the project site. Table 3 indicates the number of days that each of the standards has been exceeded at the Lancaster-43301 Division Street monitoring station. The data collected at the station indicates that the State and federal 8-hour ozone standards have been exceeded each year from 2014 to 2016; State ozone worst hour standards were exceeded each year from 2014 to 2016, while federal ozone worst hour standards were exceeded in 2015; and $PM_{2.5}$ standards were exceeded in 2014 and 2016. No other State or federal standards were exceeded at this monitoring station.

Table 3 Ambient Air Quality at the Monitoring Station

Pollutant	2014	2015	2016
8 Hour Ozone (ppm), 8-Hr Maximum	0.087	0.103	0.090
Number of Days of State exceedances (>0.070)	35	80	60
Number of days of Federal exceedances (>0.070)	35	80	60
Ozone (ppm), Worst Hour	0.101	0.132	0.108
Number of days of State exceedances (>0.09 ppm)	3	26	3
Number of days of Federal exceedances (>0.112 ppm)	0	1	0
Nitrogen Dioxide (ppm) - Worst Hour	0.519	0.418	0.488
Number of days of State exceedances (>0.18 ppm)	0	0	0
Number of days of Federal exceedances (0.10 ppm)	0	0	0
Particulate Matter 10 microns, $\mu g/m^3$, Worst 24 Hours[1]	131.5	123.8	145.0
Number of days above Federal standard (>150 $\mu g/m^3$)	0	0	0
Particulate Matter <2.5 microns, $\mu g/m^3$, Worst 24 Hours[1]	42.0	10.4	64.8
Number of days above Federal standard (>35 $\mu g/m^3$)	1	0	2

Lancaster-43301 Division Street monitoring station unless otherwise noted.
Source: ARB 2017a

Air Quality Management Plan

The AVAQMD has adopted an attainment plan (*AVAQMD Federal 8-Hour Ozone Attainment Plan, [2008 AQMP]*) for ozone pursuant to the Federal Clean Air Act, which serves as the District's Air Quality Management Plan (AVAQMD 2008). The *2008 AQMP* provided an update to the *AVAQMD 2004 Ozone Attainment Plan* and established a goal of being in attainment of the 8-hour NAAQS for ozone by 2021. As such, the *AVAQMD Federal 8-Hour Ozone Attainment Plan* includes planning assumptions regarding population, vehicle activity, and industrial activity and addresses all existing and forecast ozone precursor-producing activities within the Antelope Valley through 2020.

Sensitive Receptors

Ambient air quality standards have been established to represent the levels of air quality considered sufficient, with a margin of safety, to protect public health and welfare. They are designed to protect that segment of the public most susceptible to respiratory distress, such as children under 14; the elderly over 65; persons engaged in strenuous work or exercise; and people with cardiovascular and chronic respiratory diseases. The majority of sensitive receptor locations are therefore, schools, hospitals, and residences. The sensitive receptors closest to the project site are the single family residences located to the north, east, and south of the project site.

Local Regulations

The Palmdale General Plan Land Use Element contains the following policy specific to air quality (Palmdale 1993):

> **Policy L2.1.8.** Support creation and adoption of a separate air quality management plan for the Southeast Desert Air Basin portion of the South Coast Air Quality Management District.

There are no additional policies contained in the plan that are directly applicable to the project.

2.2 Impact Analysis

Methodology and Significance Thresholds

This air quality analysis conforms to the methodologies recommended in the *AVAQMD's California Environmental Quality Act (CEQA) and Federal Conformity Guidelines* (AVAQMD 2016). The handbook includes thresholds for emissions associated with both construction and operation that are applicable to the proposed project. Project construction would generate diesel emissions and dust. Construction equipment that would generate criteria air pollutants includes excavators, graders, cranes, dump trucks, and loaders. Some of this equipment would be used during grading activities as well as during building construction. It is assumed that all construction equipment used would be diesel-powered, based on an anticipated statewide fleet mix per the California Emissions Estimator Model (CalEEMod) defaults (California Air Pollution Control Officers Association [CAPCOA] 2017). The project's construction emissions were calculated using the CalEEMod software version 2016.3.2 using model defaults for the types and number of pieces of equipment that would be used onsite during each of the construction phases. It is assumed that grading would be balanced onsite. Additionally, the default CalEEMod phase lengths were used for each phase of construction excluding the architectural coating phase, which was extended to last approximately half of the building construction phase to reflect a more accurate construction schedule, as individual buildings would be painted as they are completed.

Operational emissions were also estimated using CalEEMod. Operational emissions include mobile source emissions, energy emissions, and area source emissions. Mobile source emissions are generated by the increase in motor vehicle trips to and from the project associated with operation of onsite development. Emissions attributed to energy use include natural gas consumption for space and water heating. Area source emissions are generated by landscape maintenance equipment, consumer products, and architectural coating.

Regional Thresholds

To determine whether a project would have a significant impact to air quality, Appendix G of the CEQA Guidelines questions whether a project would:

1) Conflict with or obstruct implementation of the applicable air quality plan
2) Violate any air quality standard or contribute substantially to an existing or projected air quality violation
3) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions that exceed quantitative thresholds for ozone precursors)
4) Expose sensitive receptors to substantial pollutant concentrations

5) Create objectionable odors affecting a substantial number of people

The AVAQMD recommends the following quantitative regional significance thresholds for temporary construction activities and long-term project operation within the western portion of the MDAB (AVAQMD 2016):

Annual Thresholds (tons)	Daily Thresholds (lbs)
100 tons per year of CO	548 pounds per day of CO
25 tons per year of NO_X	137 pounds per day of NO_X
25 tons per year of ROG	137 pounds per day of ROG
25 tons per year of SO_X	137 pounds per day of SO_X
15 tons per year of PM_{10}	82 pounds per day of PM_{10}
12 tons per year of $PM_{2.5}$	65 pounds per day of $PM_{2.5}$

Emissions thresholds are provided as a daily value and an annual value so that multi-phased projects (such as a project with a construction phase and a separate operational phase) with phases shorter than one year can be compared to the daily value. Because the proposed project construction would extend over a three year period based on CalEEMod defaults, the annual thresholds would apply to construction of the project. Additionally, because the proposed project's operation would also occur over multiple years, the annual threshold would apply to operational emissions as well.

Regulatory Requirements

Project development would comply with all applicable regulatory standards. In particular, project development would comply with 2016 CALGreen Code, in addition to AVAQMD Rules 403, *Fugitive Dust*, and 1113, *Architectural Coatings*, as well as all other applicable AVAQMD rules. Compliance with Rules 403 and 1113 were included with the CalEEMod assumptions, as discussed below.

The grading phase involves the greatest amount of heavy equipment and the greatest generation of fugitive dust. For the purposes of construction emissions modeling, it was assumed that the project would comply with AVAQMD Rule 403, which identifies measures to reduce fugitive dust and is required to be implemented at all construction sites located in the MDAB. Therefore, the following conditions, which would be required to reduce fugitive dust in compliance with AVAQMD Rule 403, were included in CalEEMod for the site preparation and grading phases of construction.

1. **Minimization of Disturbance.** Construction contractors should minimize the area disturbed by clearing, grading, earth moving, or excavation operations to prevent excessive amounts of dust.
2. **Soil Treatment.** Construction contractors should treat all graded and excavated material, exposed soil areas, and active portions of the construction site, including unpaved onsite roadways to minimize fugitive dust. Treatment shall include, but not necessarily be limited to, periodic watering, application of environmentally safe soil stabilization materials, and/or roll compaction as appropriate. Watering shall be done as often as necessary, and at least twice daily, preferably in the late morning and after work is done for the day.
3. **Soil Stabilization.** Construction contractors should monitor all graded and/or excavated inactive areas of the construction site at least weekly for dust stabilization. Soil stabilization methods, such as water and roll compaction, and environmentally safe dust control materials, shall be applied to portions of the construction site that are inactive for over four days. If no further grading or excavation operations are planned for the area, the area shall be seeded and

watered until landscape growth is evident, or periodically treated with environmentally safe dust suppressants, to prevent excessive fugitive dust.

4. **No Grading During High Winds.** Construction contractors should stop all clearing, grading, earth moving, and excavation operations during periods of high winds (20 miles per hour or greater, as measured continuously over a one-hour period).
5. **Street Sweeping.** Construction contractors should sweep all onsite driveways and adjacent streets and roads at least once per day, preferably at the end of the day, if visible soil material is carried over to adjacent streets and roads.

The architectural coating phase involves the greatest release of ROG. The emissions modeling for the project also includes the use of low-VOC paint (50 grams per liter (g/L) for flat coatings) as required by AVAQMD Rule 1113.

Construction Impacts

Table 4 summarizes maximum daily emissions of pollutants associated with buildout of the proposed project. Maximum daily estimates account for compliance with AVAQMD requirements, but do not include any additional mitigation. Emissions of CO, PM_{10}, $PM_{2.5,}$ NO_X, and ROG would not exceed AVAQMD regional thresholds, assuming adherence to the conditions listed above required by AVAQMD Rule 403 and Rule 1113.

Table 4 Estimated Construction Emissions

	Maximum Emissions[1] (tons/year)					
Construction Year	ROG	NO_x	SO_X	CO	PM_{10}	$PM_{2.5}$
2019	0.6	4.9	<0.1	4.2	0.8	0.4
2020	1.5	4.8	<0.1	5.3	0.9	0.4
2021	0.9	1.6	<0.1	1.9	0.3	0.1
Maximum tons per year	1.5	4.9	<0.1	5.3	0.9	0.4
AVAQMD Thresholds	25	25	25	100	15	12
Threshold Exceeded?	No	No	No	No	No	No

Notes: All calculations were made using CalEEMod. See Appendix A for calculations. Site Preparation, Grading, Paving, Building Construction, and Architectural Coating totals include worker trips, soil export hauling trips, construction vehicle emissions, and fugitive dust. Emission data is pulled from “mitigated” results that include compliance with regulations and project design features that will be included in the project.

[1] Grading phase incorporates anticipated emissions reductions, which are required by AVAQMD Rule 403 to reduce fugitive dust. The architectural coating phase incorporates anticipated emissions reductions, which are required by Rule 1113.

Long-Term Regional Impacts

Air Quality Management Plan Consistency

In the AVAQMD, a project would be consistent with the Air Quality Management Plan (AQMP) if it complies with all applicable District rules and regulations; complies with all proposed control measures that are not yet adopted from the applicable plan(s); and is consistent with the growth forecast in the applicable plans (AVAQMD 2016). Per the *AVAQMD CEQA and Federal Conformity Guidelines,* conformity with growth forecasts can be established by demonstrating that a project is consistent with the land use plan that was used to generate growth forecasts. An example of a non-conforming project would be one that increases the gross number of dwelling units, increases the number of trips, and/or increases the overall vehicle miles traveled in the affected area (relative to the applicable land use plan) (AVAQMD 2016). However, if the project generated emissions are less than the significance thresholds, the project would also be consistent with the AQMP (De Salvio 2018). The 2008 AQMP, the most recent AQMP adopted by the AVAQMD, incorporates local city general plans.

The proposed project involves the construction of a residential development, which could cause a direct increase in the City's housing and population. According to data provided by the California Department of Finance (DOF), the estimated population of the City of Palmdale is 158,608 and the average persons per household is 3.62 (DOF 2017). Because the project would involve the construction of 428 dwelling units, it could potentially add 1,549 residents (428 units x 3.62 persons per dwelling unit = 1,549). Southern California Association of Governments forecasts that the population of the City of Palmdale will increase by 47,300 new residents between 2012 and 2040, to a total of 201,500 residents in 2040 (SCAG 2016a). The addition of 1,549 new residents to the City would equal 3.3 percent of the City's total projected population growth through 2040. The level of population growth associated with the project was anticipated in SCAG's long-term population forecasts and would not exceed official regional population projections.

Likewise, based on SCAG estimates, there were approximately 43,100 dwelling units in Palmdale in 2012, with a projected increase of approximately 16,200 units through 2040, for a total of 59,300 units (SCAG 2016a). The increase of 428 units associated with the proposed project would represent an increase of approximately 2.6 percent. Because this housing increase would be within SCAG's projected 2040 growth for the City of Palmdale, housing growth generated by the project would be consistent with the AQMP.

Although the project is consistent with current SCAG projections, the proposed project would exceed population projections contained in the AQMP (which is based on population projections from 2002). However, the project would comply with all applicable District rules, not interfere with implementation of measures, and not exceed construction or operational thresholds established by the District. As it would not exceed construction or operational thresholds for O_3 and PM_{10}, that the Basin is in nonattainment of, it would not conflict with or obstruct implementation of the attainment plan. Furthermore, the SCAG data is the most recent and provides the most accurate estimate of population and housing projections.

Operational Air Pollutant Emissions

Table 5 summarizes estimated emissions associated with operation of the proposed project. The majority of project-related operational emissions would be due to vehicle trips to and from the site. Emissions would not exceed AVAQMD thresholds for any criteria pollutant.

Table 5 Estimated Operational Emissions

	Estimated Emissions (tons/year)					
Emissions Source	**ROG**	**NO_x**	**SO_x**	**CO**	**PM_{10}**	**$PM_{2.5}$**
Area	2.7	0.2	<0.1	3.3	<0.1	<0.1
Energy	<0.1	0.3	<0.1	0.1	<0.1	<0.1
Mobile	0.8	4.3	<0.1	10.8	3.2	0.9
Project Total	3.6	4.8	<0.1	14.2	3.2	0.9
AVAQMD Thresholds	25	25	25	100	15	12
Threshold Exceeded?	No	No	No	No	No	No

See Appendix A for CalEEMod computer model output. Note: Numbers may not add up due to rounding.

Local Carbon Monoxide Hotspots

Areas with high vehicle density, such as congested intersections, have the potential to create high concentrations of CO, known as CO hotspots. A project's localized air quality impact is considered significant if CO emissions create a hotspot where either the California one-hour standard of 20 parts per million (ppm) or the federal and State eight-hour standard of 9.0 ppm is exceeded. This typically occurs at severely congested intersections (level of service [LOS] E or worse). As shown in Table 5, CO emissions that would be generated from buildout of the project would not exceed AVAQMD thresholds. Further, CO levels at the closest air quality monitoring station, the Lancaster-43301 Division Street station, have consistently been substantially below the State and federal standards (ARB 2017a). Additionally, the AVAQMD is in attainment for the State and federal standards for CO. Because background CO concentrations are low and the project would not generate CO emissions above thresholds, the project would not result in the creation of CO hotspots or expose sensitive receptors to substantial pollutant concentrations.

Odors

The *AVAQMD California Environmental Quality Act (CEQA) and Federal Conformity Guidelines* do not discuss potential impacts associated with odors. However, the AVAQMD was formerly under the jurisdiction of the South Coast Air Quality Management District (SCAQMD) and the *1993 SCAQMD CEQA Air Quality Handbook* identifies land uses associated with odor complaints. These land uses include: agriculture (farming and livestock), wastewater treatment plants, food processing plants, chemical plants, composting facilities, refineries, landfills, dairies, and fiberglass molding facilities. Residential uses are not identified as land uses associated with odor complaints in the *1993 SCAQMD CEQA Air Quality Handbook*. Therefore, the proposed project would not generate objectionable odors affecting a substantial number of people.

Toxic Air Contaminants (TACs)

The ARB's *Quality and Land Use Handbook: A Community Health Perspective* (2005) recommends against siting sensitive receptors within 500 feet of a freeway, urban roads with 100,000 vehicles/day, or rural roads with 50,000 vehicles/day, or near other major sources of toxic air contaminants (TACs), such as rail yards, distribution centers, ports, or refineries. The primary concern with respect to freeway adjacency is the long-term effect of diesel exhaust particulates, a TAC, on sensitive receptors. The primary source of diesel exhaust particulates is heavy-duty trucks on freeways and high-volume arterial roadways. The project site is located approximately 0.6 miles from the Antelope Valley Freeway, and there are no rail yards, distribution centers, ports, refineries, or other major sources of TACs in the vicinity. Furthermore, the portion of the Antelope Valley Freeway that is closest to the project site has approximately 89,000 annual average daily trips (AADT) (Caltrans 2016). Although the project would be a sensitive receptor, the project site is not located near TAC sources that would result in substantial health risks to future residents.

3 Greenhouse Gases

3.1 Background

This section analyzes GHG emissions associated with the project and potential impacts related to climate change.

Climate Change and Greenhouse Gases

Climate change is the observed increase in the average temperature of Earth's atmosphere and oceans along with other substantial changes in climate (such as wind patterns, precipitation, and storms) over an extended period of time. The term "climate change" is often used interchangeably with the term "global warming," but "climate change" is preferred to "global warming" because it helps convey that there are other changes in addition to rising temperatures. The baseline against which these changes are measured originates in historical records identifying temperature changes that have occurred in the past, such as during previous ice ages. The global climate is continuously changing, as evidenced by repeated episodes of substantial warming and cooling documented in the geologic record. The rate of change has typically been incremental, with warming or cooling trends occurring over the course of thousands of years. The past 10,000 years have been marked by a period of incremental warming, as glaciers have steadily retreated across the globe. However, scientists have observed acceleration in the rate of warming during the past 150 years. Per the United Nations Intergovernmental Panel on Climate Change (IPCC 2014), the understanding of anthropogenic warming and cooling influences on climate has led to a high confidence (95 percent or greater chance) that the global average net effect of human activities has been the dominant cause of warming since the mid-20th century (IPCC 2014).

Gases that absorb and re-emit infrared radiation in the atmosphere are called greenhouse gases (GHG). The gases that are widely seen as the principal contributors to human-induced climate change include carbon dioxide (CO_2), methane (CH_4), nitrous oxides (N_2O), fluorinated gases such as hydrofluorocarbons (HFCs) and perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6). Water vapor is excluded from the list of GHG because it is short-lived in the atmosphere and its atmospheric concentrations are largely determined by natural processes, such as oceanic evaporation.

Both natural processes and human activities emit GHGs. CO_2 and CH_4 are emitted in the greatest quantities from human activities. Emissions of CO_2 are largely by-products of fossil fuel combustion, whereas CH_4 results from off-gassing associated with agricultural practices and landfills. Observations of CO_2 concentrations, globally-averaged temperature, and sea level rise are generally well within the range of the extent of the earlier IPCC projections. The recently observed increases in CH_4 and N_2O concentrations are smaller than those assumed in the scenarios in the previous assessments. Each IPCC assessment has used new projections of future climate change that have become more detailed as the models have become more advanced.

Man-made GHGs, many of which have greater heat-absorption potential than CO_2, include fluorinated gases and SF_6 (CalEPA 2006). Different types of GHGs have varying global warming potentials (GWP). The GWP of a GHG is the potential of a gas or aerosol to trap heat in the atmosphere over a specified timescale (generally, 100 years). Because GHG absorb different amounts of heat, a common reference gas (CO_2) is used to relate the amount of heat absorbed to the amount of the gas emissions, referred to as "carbon dioxide equivalent" (CO_2e), and is the amount of a GHG emitted multiplied by its GWP. CO_2 has a 100-year GWP of one. By contrast, CH_4 has a GWP of 25, meaning its global warming effect is 25 times greater than CO_2 on a molecule per molecule basis (IPCC 2007).

The accumulation of GHGs in the atmosphere regulates the earth's temperature. Without the natural heat trapping effect of GHGs, Earth's surface would be about 34° C cooler (CalEPA 2006). However, it is believed that emissions from human activities, particularly the consumption of fossil fuels for electricity production and transportation, have elevated the concentration of these gases in the atmosphere beyond the level of naturally occurring concentrations.

Greenhouse Gas Emissions Inventory

Worldwide anthropogenic emissions of GHG were approximately 46,000 million metric tons (MMT or gigatonne) of CO_2e in 2010 (IPCC 2014). CO_2 emissions from fossil fuel combustion and industrial processes contributed about 65 percent of total emissions in 2010. Of anthropogenic GHGs, CO_2 was the most abundant accounting for 76 percent of total 2010 emissions. CH_4 emissions accounted for 16 percent of the 2010 total, while N_2O and fluorinated gases account for 6 and 2 percent respectively (IPCC 2014).

Total U.S. GHG emissions were 6,586.7 million metric tons (MMT or gigatonne) CO_2e in 2015 (U.S. EPA 2017). Total U.S. emissions have increased by 3.5 percent since 1990; emissions decreased by 2.3 percent from 2014 to 2015 (U.S. EPA 2017). The decrease from 2014 to 2015 was a result of multiple factors, including: (1) substitution from coal to natural gas consumption in the electric power sector; (2) warmer winter conditions in 2015 resulting in a decreased demand for heating fuel in the residential and commercial sectors; and (3) a slight decrease in electricity demand (U.S. EPA 2017). Since 1990, U.S. emissions have increased at an average annual rate of 0.2 percent. In 2015, the industrial and transportation end-use sectors accounted for 29 percent and 27 percent of CO_2 emissions (with electricity-related emissions distributed), respectively. Meanwhile, the residential and commercial end-use sectors accounted for 16 percent and 17 percent of CO_2 emissions, respectively (U.S. EPA 2017).

Based upon the ARB *California Greenhouse Gas Inventory for 2000-2015*, California produced 440.4 MMT CO2e in 2015 (ARB 2017b). The major source of GHG in California is transportation, contributing 39 percent of the state's total GHG emissions. Industrial sources are the second largest source of the state's GHG emissions (ARB 2017b). California emissions are due in part to its large size and large population compared to other states. However, a factor that reduces California's per capita fuel use and GHG emissions, as compared to other states, is its relatively mild climate. The ARB has projected statewide unregulated GHG emissions for the year 2020 will be 509.4 MMT CO_2e (ARB 2017c). These projections represent the emissions that would be expected to occur in the absence of any GHG reduction actions.

Potential Effects of Climate Change

Globally, climate change has the potential to affect numerous environmental resources through potential impacts related to future air, land, and water temperatures and precipitation patterns. Scientific modeling predicts that continued GHG emissions at or above current rates would induce more extreme climate changes during the 21st century than were observed during the 20th century. Long-term trends have found that each of the past three decades has been warmer than all the previous decades in the instrumental record, and the decade from 2000 through 2010 has been the warmest. The global combined land and ocean temperature data show an increase of about 0.89°C (0.69°C–1.08°C) over the period 1901–2012 and about 0.72°C (0.49°C–0.89°C) over the period 1951–2012 when described by a linear trend. Several independently analyzed data records of global and regional Land-Surface Air Temperature (LSAT) obtained from station observations are in agreement that LSAT, as well as sea surface temperatures, has increased. In addition to these findings, there are identifiable signs that global warming is currently taking place, including substantial ice loss in the Arctic over the past two decades (IPCC 2014).

According to the CalEPA's 2010 Climate Action Team Biennial Report, potential impacts of climate change in California may include decreased snow pack, sea level rise, and increase in extreme heat days per year, high ground-level O_3 days, large forest fires, and drought (CalEPA 2010). Below is a summary of some of the potential impacts that could be experienced in California as a result of climate change.

Air Quality

Higher temperatures, which are conducive to air pollution formation, could worsen air quality in many areas of California. Climate change may increase the concentration of ground-level O_3, but the magnitude of the effect, and therefore its indirect effects, are uncertain. If higher temperatures are accompanied by drier conditions, the potential for large wildfires could increase, which, in turn, would further worsen air quality. However, if higher temperatures are accompanied by wetter, rather than drier conditions, the rains would tend to temporarily clear the air of particulate pollution and reduce the incidence of large wildfires, thereby ameliorating the pollution associated with wildfires. Additionally, severe heat accompanied by drier conditions and poor air quality could increase the number of heat-related deaths, illnesses, and asthma attacks throughout the state (CEC 2009).

Water Supply

Analysis of paleoclimatic data (such as tree-ring reconstructions of stream flow and precipitation) indicates a history of naturally and widely varying hydrologic conditions in California and the west, including a pattern of recurring and extended droughts. Uncertainty remains with respect to the overall impact of climate change on future water supplies in California. However, the average early spring snowpack in the Sierra Nevada decreased by about 10 percent during the last century, a loss of 1.5 million acre-feet of snowpack storage. During the same period, sea level rose eight inches along California's coast. California's temperature has risen 1°F, mostly at night and during the winter, with higher elevations experiencing the highest increase. Many Southern California cities have experienced their lowest recorded annual precipitation twice within the past decade. In a span of only two years, Los Angeles experienced both its driest and wettest years on record (DWR 2008; CCCC 2009).

This uncertainty complicates the analysis of future water demand, especially where the relationship between climate change and its potential effect on water demand is not well understood. The Sierra snowpack provides the majority of California's water supply by accumulating snow during the state's wet winters and releasing it slowly during the state's dry springs and summers. Based upon historical data and modeling DWR projects that the Sierra snowpack will experience a 25 to 40 percent reduction from its historic average by 2050. Climate change is also anticipated to bring warmer storms that result in less snowfall at lower elevations, reducing the total snowpack (DWR 2008).

Hydrology and Sea Level Rise

As discussed above, climate change could potentially affect: the amount of snowfall, rainfall, and snow pack; the intensity and frequency of storms; flood hydrographs (flash floods, rain or snow events, coincidental high tide and high runoff events); sea level rise and coastal flooding; coastal erosion; and the potential for salt water intrusion. According to The Impacts of Sea-Level Rise on the California Coast, prepared by the CCCC (CCCC 2009), climate change has the potential to induce substantial sea level rise in the coming century. The rising sea level increases the likelihood and risk of flooding. The rate of increase of global mean sea levels over the 2001-2010 decade, as observed by satellites, ocean buoys and land gauges, was approximately 3.2 mm per year, which is double the observed 20th century trend of 1.6 mm per year (WMO 2013). As a result, sea levels averaged over the last decade were about 8 inches higher than those of 1880 (WMO 2013). Sea levels are rising faster now than in the previous two millennia, and the rise is expected to accelerate, even with robust GHG emission control measures. The most recent IPCC report (2013) predicts a mean sea–level rise of 11-38 inches by 2100. This prediction is more than 50 percent higher than earlier projections of 7-23 inches, when comparing the same emissions scenarios and time periods. A rise in sea levels could result in coastal flooding and erosion and could jeopardize California's water supply due to salt water intrusion. In addition, increased CO_2 emissions can cause oceans to acidify due to the carbonic acid it forms. Increased storm intensity and frequency could affect the ability of flood-control facilities, including levees, to handle storm events.

Agriculture

California has a $30 billion annual agricultural industry that produces half of the country's fruits and vegetables. Higher CO_2 levels can stimulate plant production and increase plant water-use efficiency. However, if temperatures rise and drier conditions prevail, water demand could increase; crop-yield could be threatened by a less reliable water supply; and greater air pollution could render plants more susceptible to pest and disease outbreaks. In addition, temperature increases could change the time of year certain crops, such as wine grapes, bloom or ripen, and thereby affect their quality (CCCC 2006).

Ecosystems and Wildlife

Climate change and the potential resulting changes in weather patterns could have ecological effects on the local and global levels. Increasing concentrations of GHGs are likely to accelerate the rate and severity of climate change impacts. Scientists project that the average global surface temperature could rise by 1.0-4.5°F (0.6-2.5°C) in the next 50 years, and 2.2-10°F (1.4-5.8°C) during the next century, with substantial regional variation. Soil moisture is likely to decline in many regions, and intense rainstorms are likely to become more frequent. Rising temperatures could have four major impacts on plants and animals: (1) timing of ecological events; (2) geographic range; (3) species' composition within communities; and (4) ecosystem processes, such as carbon cycling and storage (Parmesan 2006).

Regulatory Setting

The following regulations address both climate change and GHG emissions.

California Regulations

The ARB is responsible for the coordination and oversight of State and local air pollution control programs in California. California has numerous regulations aimed at reducing the State's GHG emissions. These initiatives are summarized below.

Assembly Bill (AB) 1493 (2002), California's Advanced Clean Cars program (referred to as "Pavley"), requires the ARB to develop and adopt regulations to achieve "the maximum feasible and cost-effective reduction of GHG emissions from motor vehicles." On June 30, 2009, the U.S. EPA granted the waiver of Clean Air Act preemption to California for its greenhouse gas emission standards for motor vehicles beginning with the 2009 model year. Pavley I took effect for model years starting in 2009 to 2016 and Pavley II, which is now referred to as "LEV (Low Emission Vehicle) III GHG" will cover 2017 to 2025. Fleet average emission standards would reach 22 percent reduction from 2009 levels by 2012 and 30 percent by 2016. The Advanced Clean Cars program coordinates the goals of the Low Emissions Vehicles (LEV), Zero Emissions Vehicles (ZEV), and Clean Fuels Outlet programs and would provide major reductions in GHG emissions. By 2025, when the rules will be fully implemented, new automobiles will emit 34 percent fewer GHGs and 75 percent fewer smog-forming emissions from their model year 2016 levels (ARB 2011).

In 2005, the governor issued Executive Order (EO) S-3-05, establishing statewide GHG emissions reduction targets. EO S-3-05 provides that by 2010, emissions shall be reduced to 2000 levels; by 2020, emissions shall be reduced to 1990 levels; and by 2050, emissions shall be reduced to 80 percent below 1990 levels (CalEPA 2006). In response to EO S-3-05, CalEPA created the Climate Action Team (CAT), which in March 2006 published the Climate Action Team Report (the "2006 CAT Report") (CalEPA 2006). The 2006 CAT Report identified a recommended list of strategies that the State could pursue to reduce GHG emissions. These are strategies that could be implemented by various State agencies to ensure that the emission reduction targets in EO S-3-05 are met and can be met with existing authority of the State agencies. The strategies include the reduction of passenger and light duty truck emissions, the reduction of idling times for diesel trucks, an overhaul of shipping technology/infrastructure, increased use of alternative fuels, increased recycling, and landfill methane capture, etc. In April 2015, the governor issued EO B-30-15, calling for a new target of 40 percent below 1990 levels by 2030.

California's major initiative for reducing GHG emissions is outlined in Assembly Bill (AB) 32, the "California Global Warming Solutions Act of 2006," signed into law in 2006. AB 32 codifies the statewide goal of reducing GHG emissions to 1990 levels by 2020 (essentially a 15 percent reduction below 2005 emission levels; the same requirement as under S-3-05), and requires the ARB to prepare a Scoping Plan that outlines the main State strategies for reducing GHGs to meet the 2020 deadline. In addition, AB 32 requires the ARB to adopt regulations to require reporting and verification of statewide GHG emissions.

After completing a comprehensive review and update process, the ARB approved a 1990 statewide GHG level and 2020 limit of 427 MMT of CO_2e. The Scoping Plan was approved by the ARB on December 11, 2008, and included measures to address GHG emission reduction strategies related to energy efficiency, water use, and recycling and solid waste, among other measures. Many of the GHG reduction measures included in the Scoping Plan (e.g., Low Carbon Fuel Standard, Advanced Clean Car standards, and Cap-and-Trade) have been adopted since approval of the Scoping Plan. Implementation activities are ongoing and the ARB recently updated the Scoping Plan.

In May 2014, the ARB approved the first update to the AB 32 Scoping Plan. The 2013 Scoping Plan update defines the ARB's climate change priorities for the next five years and sets the groundwork to reach post-2020 goals set forth in EO S-3-05. The update highlights California's progress toward meeting the "near-term" 2020 GHG emission reduction goals defined in the original Scoping Plan. It also evaluates how to align the State's longer-term GHG reduction strategies with other State policy priorities, such as for water, waste, natural resources, clean energy and transportation, and land use (ARB 2017b).

Senate Bill (SB) 97, signed in August 2007, acknowledges that climate change is an environmental issue that requires analysis in CEQA documents. In March 2010, the California Resources Agency (Resources Agency) adopted amendments to the State CEQA Guidelines for the feasible mitigation of GHG emissions or the effects of GHG emissions. The adopted guidelines give lead agencies the discretion to set quantitative or qualitative thresholds for the assessment and mitigation of GHGs and climate change impacts.

ARB Resolution 07-54 establishes 25,000 MT of GHG emissions as the threshold for identifying the largest stationary emission sources in California for purposes of requiring the annual reporting of emissions. This threshold is just over 0.005 percent of California's total inventory of GHG emissions for 2004.

Senate Bill (SB) 375, signed in August 2008, enhances the state's ability to reach AB 32 goals by directing ARB to develop regional GHG emission reduction targets to be achieved from passenger vehicles for 2020 and 2035. In addition, SB 375 directs each of the state's 18 major Metropolitan Planning Organizations (MPO) to prepare a "sustainable communities strategy" (SCS) that contains a growth strategy to meet these emission targets for inclusion in the RTP. On September 23, 2010, ARB adopted final regional targets for reducing GHG emissions from 2005 levels by 2020 and 2035.

The SCAG was assigned targets of an 8 percent reduction in GHGs from transportation sources by 2020 and a 13 percent reduction in GHGs from transportation sources by 2035. In the SCAG region, SB 375 also provides the option for the coordinated development of subregional plans by the subregional councils of governments and the county transportation commissions to meet SB 375 requirements.

In April 2011, the governor signed SB 2X, requiring California to generate 33 percent of its electricity from renewable energy by 2020.

On September 8, 2016, the governor signed Senate Bill 32 (SB 32) into law, extending AB 32 by requiring the State to further reduce GHGs to 40 percent below 1990 levels by 2030 (the other provisions of AB 32 remain unchanged). On December 14, 2017, the ARB adopted the 2017 Scoping Plan, which provides a framework for achieving the 2030 target. The 2017 Scoping Plan relies on the continuation and expansion of existing policies and regulations, such as the Cap-and-Trade Program, as well as implementation of recently adopted programs and policies, such as SB 350 and SB 1383 (see below). The 2017 Scoping Plan also puts an increased emphasis on innovation, adoption of existing technology, and strategic investment to support its strategies. As with the 2013 Scoping Plan Update, the 2017 Scoping Plan does not provide project-level thresholds for land use development. Instead, it recommends that local governments adopt policies and locally-appropriate quantitative thresholds consistent with a statewide per capita goal of six metric tons (MT) of CO_2e by 2030 and two MT of CO_2e by 2050 (ARB 2017c). As stated in the 2017 Scoping Plan, these goals may be appropriate for plan-level analyses (city, county, subregional, or regional level), but not for specific individual projects because they include all emissions sectors in the State.

Adopted on October 7, 2015, SB 350 supports the reduction of GHG emissions from the electricity sector through a number of measures, including requiring electricity providers to achieve a 50 percent renewables portfolio standard by 2030, a cumulative doubling of statewide energy efficiency savings in electricity and natural gas by retail customers by 2030.

Adopted in September 2016, SB 1383 requires the ARB to approve and begin implementing a comprehensive strategy to reduce emissions of short-lived climate pollutants. The bill requires the strategy to achieve the following reduction targets by 2030:

- Methane – 40% below 2013 levels
- Hydrofluorocarbons – 40% below 2013 levels
- Anthropogenic black carbon – 50% below 2013 levels

The bill also requires CalRecycle, in consultation with the State board, to adopt regulations that achieve specified targets for reducing organic waste in landfills.

For more information on the Senate and Assembly Bills, Executive Orders, and reports discussed above, and to view reports and research referenced above, please refer to the following websites: www.climatechange.ca.gov and www.arb.ca.gov/cc/cc.htm.

California Environmental Quality Act

Pursuant to the requirements of SB 97, the Resources Agency has adopted amendments to the State CEQA Guidelines for the feasible mitigation of GHG emissions or the effects of GHG emissions. The adopted CEQA Guidelines provide general regulatory guidance on the analysis and mitigation of GHG emissions in CEQA documents, while giving lead agencies the discretion to set quantitative or qualitative thresholds for the assessment and mitigation of GHGs and climate change impacts. To date, a variety of air districts have adopted quantitative significance thresholds for GHGs.

Regional Regulations

As discussed above, SB 375 requires MPOs to prepare an RTP/SCS that will achieve regional emission reductions through sustainable transportation and growth strategies. On September 23, 2010, the ARB adopted final regional targets for reducing GHG emissions from 2005 levels by 2020 and 2035. SCAG was assigned targets of an 8 percent reduction in GHGs from transportation sources by 2020 and a 13 percent reduction in GHGs from transportation sources by 2035. Most recently, SCAG adopted the 2016-2040 RTP/SCS on April 7, 2016. It includes a number of strategies and objectives to encourage transit-oriented and infill development and use of alternative transportation to minimize vehicle use.

Local Regulations

The City of Palmdale adopted an Energy Action Plan (EAP) in August 2011 (City of Palmdale 2011). The EAP was developed to achieve energy independence, efficiency, and conservation; and establish land uses that reduce transportation time and costs, encourage job creation, and identify strategies to increase investment in the local economy. The primary purpose of the EAP was to identify how the City would use energy efficiency and independence strategies to achieve its GHG emission reduction target of 15 percent by 2020, consistent with the State's overall target to reduce GHG emissions statewide to 1990 levels by 2020. The EAP includes goals and measures focused on energy, water, transportation, land use, and solid waste to reduce GHG emissions and enhance the local economy, while reducing reliance on inefficient energy imports. The EAP establishes an emission reduction goal[4] and appears to be a qualified GHG reduction plan per the requirements of CEQA 15183.5. Specifically, the plan:

- Quantifies GHG emissions, both existing and projected over a specified period of time
- Establishes a level, based on substantial evidence, below which the contribution of GHG emissions from activities covered by the plan would not be cumulatively considerable
- Identifies and analyzes the GHG emissions resulting from specific actions or categories of actions anticipated within the City
- Specifies measures, including performance standards, that substantial evidence demonstrates, if implemented on a project-by-project basis, would collectively achieve the specified emissions levels
- Establishes a mechanism to monitor the plan's progress towards achieving the level and to require amendment if the plan is not achieving specified standards
- Was adopted in a public process following environmental review

3.2 Impact Analysis

Significance Thresholds

Based on Appendix G of the State CEQA Guidelines, impacts related to GHG emissions from the project would be significant if the project would:

- Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment
- Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of GHGs

The vast majority of individual projects do not generate sufficient GHG emissions to directly influence climate change. However, physical changes caused by a project can contribute incrementally to cumulative effects that are significant, even if individual changes resulting from a project are limited. The issue of climate change typically involves an analysis of whether a project's contribution towards an impact would be cumulatively considerable. "Cumulatively considerable" means that the incremental effects of an individual project are significant when viewed in connection with the effects of past projects, other current projects, and probable future projects (CEQA Guidelines, Section 15064[h][1]).

For future projects, the significance of GHG emissions may be evaluated based on locally adopted quantitative thresholds or by establishing a project's consistency with a regional GHG reduction plan (such as a Climate Action Plan). Although the City of Palmdale has a qualified GHG reduction plan, the entirety of the project design features are not currently known and consistency with the specific EAP measures were not able to be determined at this time. However, the AVAQMD has adopted a GHG emissions threshold of 100,000 tons per year or 548,000 pounds per day for projects that are shorter than one year (AVAQMD 2016). Per the CEQA Guidelines, Lead Agencies have discretion to formulate their own significance thresholds. Therefore, the project-generated emissions were compared to the applicable AVAQMD adopted GHG threshold. Because project construction would take approximately 28 months, based on CalEEMod defaults, the emissions from each year of construction, as well as operation, are compared to 100,000 ton per year threshold.

[4] Although the EAP establishes an emission reduction strategy, it is not consistent with the requirements of SB 32.

Study Methodology

This analysis is based on the methodologies recommended by the CAPCOA (2008) *CEQA and Climate Change* white paper and focuses on CO_2, CH_4, and N_2O because these make up 98.9 percent of all GHG emissions by volume and are the GHG emissions that the project would emit in the largest quantities (IPCC 2007). Fluorinated gases, such as HFCs, PFCs, and SF_6, were also considered for the analysis, but because the project involves residential development, the quantity of fluorinated gases would not be significant since fluorinated gases are primarily associated with industrial processes. Emissions of all GHGs are converted into their equivalent GWP in MT of CO_2e. Small amounts of other GHGs (such as chlorofluorocarbons [CFCs]) would also be emitted; however, these other GHGs would not substantially add to the total GHG emissions. Calculations are based on the methodologies discussed in the CAPCOA *CEQA and Climate Change* white paper (CAPCOA 2008) and included the use of the California Climate Action Registry (CCAR) *General Reporting Protocol* (CCAR 2009). GHG emissions associated with the project were calculated using CalEEMod version 2016.3.2 (Appendix A). As outlined in *California Regulations*, SB 32 nor the 2017 Scoping Plan provides project-level thresholds for land use development; therefore, the applicable greenhouse gas threshold of 100,000 ton per year, as outlined in the *AVAQMD CEQA and Federal Conformity Guidelines* was used to determine the potential GHG-related impacts of the project (AVAQMD 2016).

Construction Emissions

Although construction activity is addressed in this analysis, CAPCOA does not discuss whether any of the suggested threshold approaches adequately address impacts from temporary construction activity. Construction of the project would generate temporary GHG emissions primarily due to the operation of construction equipment and truck trips. Site preparation and grading typically generate the greatest amount of emissions due to the use of grading equipment and soil hauling. CalEEMod provides an estimate of emissions associated with the construction period, based on parameters such as the duration of construction activity, area of disturbance, and anticipated equipment to be utilized during construction. As mentioned, in Section 2.2, *Impact Analysis*, CalEEMod defaults for the types and number of pieces of equipment that would be used onsite during each of the construction phases were used. Additionally, the default CalEEMod phase lengths were used for each phase of construction excluding the architectural coating phase, which was extended to last approximately half of the building construction phase to reflect a more accurate construction schedule, as individual buildings would be painted as they are completed. Complete results from CalEEMod and assumptions can be viewed in Appendix A.

Operational Emissions

CalEEMod was also used to calculate operational emissions from the project, which include CO_2, N_2O, and CH_4. Energy-related emissions are from electricity and natural gas use. The emissions factors for natural gas combustion are based on EPA's AP-42, (Compilation of Air Pollutant Emissions Factors) and CCAR. Electricity emissions are calculated by multiplying the energy use by the carbon intensity of the utility district per kilowatt hour (CAPCOA 2017).

Emissions associated with area sources, including consumer products, landscape maintenance, and architectural coating were calculated in CalEEMod and utilize standard emission rates from ARB, U.S. EPA, and district supplied emission factor values (CAPCOA 2017).

Emissions from waste generation were also calculated in CalEEMod and are based on the IPCC's methods for quantifying GHG emissions from solid waste using the degradable organic content of waste (CAPCOA 2017). Waste disposal rates by land use and overall composition of municipal solid waste in California was primarily based on data provided by the California Department of Resources Recycling and Recovery (CalRecycle).

Emissions from water and wastewater use calculated in CalEEMod were based on the default electricity intensity from the CEC's *2006 Refining Estimates of Water-Related Energy Use in California* using the average values for Southern California.

For mobile sources, CO_2 and CH_4 emissions from vehicle trips to and from the project site were quantified using CalEEMod. Because CalEEMod does not calculate N_2O emissions from mobile sources, N_2O emissions were quantified using the CCAR *General Reporting Protocol* (2009) direct emissions factors for mobile combustion (see Appendix A for calculations). The estimate of total daily trips associated with the project was based on CalEEMod defaults. Emission rates for N_2O emissions were based on the vehicle fleet mix output generated by CalEEMod and the emission factors found in the CCAR *General Reporting Protocol*.

Project Impacts

The following summarizes project emissions and compares calculated emissions to the recommended GHG emissions threshold of 100,000 tons of CO_2e per year.

Construction Emissions

As shown in Table 6, construction activity for the project would generate a maximum of 1,498 tons of CO_2e per year.

Table 6 Estimated Construction Emissions of Greenhouse Gases

Construction Year	Annual Emissions (tons of CO_2e)
2019	1,075.5
2020	1,497.6
2021	508.1
Maximum tons per year	1,497.6
Threshold[1]	100,000
Exceeds Threshold?	No

1. AVAQMD 2016

See Appendix A for CalEEMod results.

GHG emissions are reported in metric tons in CalEEMod; 1 metric ton (MT) = 1.10231 US ton (Ton)

Combined Construction, Stationary, and Mobile Source Emissions

Table 7 combines the 2021 construction emissions (Table 6) with the annual operational (stationary and mobile source) emissions associated with the project to provide a conservative estimate of the emissions that would be generated during 2021, when the project is both constructed and operational. The maximum combined annual emissions would total approximately 6,443 tons of CO_2e. These emissions do not exceed the AVAQMD threshold of 100,000 tons of CO_2e per year.

Table 7 Combined Annual Emissions Tons of CO_2e/year

Emission Source	Project Emissions
2021 Construction Emissions	508.1
Operational	
Area	214.4
Energy	1,223.4
Solid Waste	130.7
Water	253.3
Mobile	
CO_2 and CH_4	3,921.5
N_2O	191.9
Total	**6,443.4**
AVAQMD Threshold[1]	100,000
Exceeds Threshold?	No

1. AVAQMD 2016

GHG emissions are reported in metric tons in CalEEMod; 1 metric ton (MT) = 1.10231 US ton (Ton)

Source: Calculations were made in CalEEMod, see Appendix A for full model output. Values have been rounded

Consistency with GHG Reduction Plans and Policies

As discussed under *Regulatory Setting*, a few plans and policies have been adopted to reduce GHG emissions in the Southern California region and the City of Palmdale. Specifically, the project would be consistent with the SCAG RTP/SCS goals and policies. In addition to the RTP/SCS, the City of Palmdale has adopted an EAP. The goals of the EAP include reducing energy demand through energy conservation and efficiency; reducing water consumption for energy conservation; promoting renewable energy generation and use; reducing transportation emissions through alternative vehicles, trip reductions and consolidation, and efficient flow; implementing smart land use to reduce vehicular trips; reducing waste; and supporting the "buy-local" movement. The project design features have not yet been identified, therefore, the project's consistency with the EAP cannot be sufficiently determined at this time. However, as required the design and implementation of the proposed project would align with the goals of the CALGreen Building Standards, which include measures such as inclusion of water efficient plumbing fittings and fixtures, to reduce emissions. Further, the proposed project would comply with AVAQMD Rule 1113 that limits ROGs from building architectural coatings to 50 grams/liter (g/L). The proposed project would be constructed on a vacant site in close proximity to commercial uses (e.g. 0.3 miles to the Antelope Valley Mall and 0.7 miles from additional commercial uses along Rancho Vista Boulevard) that would generate a maximum of 6,443 tons of CO_2e per year. The construction and operational GHG emissions are below the AVAQMD-recommended significance threshold of 100,000 tons of CO_2e per year.

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Appendix A

CalEEMod Air Quality and Greenhouse Gas Modeling Results

20th and Rancho

Los Angeles-Mojave Desert County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Parking Lot	1,039.00	Space	9.35	415,600.00	0
City Park	3.06	Acre	3.06	133,345.00	0
Recreational Swimming Pool	0.80	1000sqft	0.02	800.00	0
Apartments Low Rise	320.00	Dwelling Unit	13.70	320,000.00	915
Condo/Townhouse	60.00	Dwelling Unit	2.90	60,000.00	172
Single Family Housing	48.00	Dwelling Unit	3.03	86,400.00	137

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	33
Climate Zone	9			**Operational Year**	2022
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 - Source: site plan, acreage included in residential component; assumed club house was 250 sf and swimming pool was 20x40

Construction Phase - Architectural coating phase updated to reflect more accurate construction schedule

Architectural Coating - CalGreen and AVAQMD Rule 1113

Vehicle Trips - City park land use used as proxy for usable open space

Woodstoves - No woodburning fireplaces or stoves onsite per client

Construction Off-road Equipment Mitigation -

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	EF_Nonresidential_Exterior	250.00	50.00
tblArchitecturalCoating	EF_Nonresidential_Interior	250.00	50.00
tblArchitecturalCoating	EF_Residential_Exterior	250.00	50.00
tblArchitecturalCoating	EF_Residential_Interior	250.00	50.00
tblConstructionPhase	NumDays	35.00	250.00
tblFireplaces	FireplaceWoodMass	3,078.40	0.00
tblFireplaces	FireplaceWoodMass	3,078.40	0.00
tblFireplaces	FireplaceWoodMass	3,078.40	0.00
tblFireplaces	NumberGas	33.00	36.30
tblFireplaces	NumberNoFireplace	6.00	6.60
tblFireplaces	NumberWood	112.00	0.00
tblFireplaces	NumberWood	21.00	0.00
tblFireplaces	NumberWood	16.80	0.00
tblLandUse	LandUseSquareFeet	133,293.60	133,345.00
tblLandUse	LotAcreage	20.00	13.70
tblLandUse	LotAcreage	3.75	2.90
tblLandUse	LotAcreage	15.58	3.03
tblVehicleTrips	ST_TR	22.75	0.00

tblVehicleTrips	SU_TR	16.74	0.00
tblVehicleTrips	WD_TR	1.89	0.00
tblWoodstoves	NumberCatalytic	16.00	0.00
tblWoodstoves	NumberCatalytic	3.00	0.00
tblWoodstoves	NumberCatalytic	2.40	0.00
tblWoodstoves	NumberNoncatalytic	16.00	0.00
tblWoodstoves	NumberNoncatalytic	3.00	0.00
tblWoodstoves	NumberNoncatalytic	2.40	0.00
tblWoodstoves	WoodstoveDayYear	82.00	0.00
tblWoodstoves	WoodstoveDayYear	82.00	0.00
tblWoodstoves	WoodstoveDayYear	82.00	0.00
tblWoodstoves	WoodstoveWoodMass	3,019.20	0.00
tblWoodstoves	WoodstoveWoodMass	3,019.20	0.00
tblWoodstoves	WoodstoveWoodMass	3,019.20	0.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2019	0.5598	4.8631	4.2177	0.0106	0.7948	0.1937	0.9885	0.2932	0.1807	0.4739	0.0000	972.5376	972.5376	0.1274	0.0000	975.7231
2020	1.5296	4.8247	5.2503	0.0148	0.7276	0.1688	0.8965	0.1960	0.1593	0.3553	0.0000	1,355.4957	1,355.4957	0.1226	0.0000	1,358.5603
2021	0.9354	1.5612	1.8763	5.0600e-003	0.2428	0.0564	0.2991	0.0653	0.0531	0.1183	0.0000	459.7877	459.7877	0.0472	0.0000	460.9684
Maximum	**1.5296**	**4.8631**	**5.2503**	**0.0148**	**0.7948**	**0.1937**	**0.9885**	**0.2932**	**0.1807**	**0.4739**	**0.0000**	**1,355.4957**	**1,355.4957**	**0.1274**	**0.0000**	**1,358.5603**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2019	0.5598	4.8631	4.2177	0.0106	0.5881	0.1937	0.7818	0.1941	0.1807	0.3748	0.0000	972.5372	972.5372	0.1274	0.0000	975.7227
2020	1.5296	4.8247	5.2503	0.0148	0.7276	0.1688	0.8965	0.1960	0.1593	0.3553	0.0000	1,355.4954	1,355.4954	0.1226	0.0000	1,358.5599
2021	0.9354	1.5612	1.8763	5.0600e-003	0.2428	0.0564	0.2991	0.0653	0.0531	0.1183	0.0000	459.7875	459.7875	0.0472	0.0000	460.9682
Maximum	**1.5296**	**4.8631**	**5.2503**	**0.0148**	**0.7276**	**0.1937**	**0.8965**	**0.1960**	**0.1807**	**0.3748**	**0.0000**	**1,355.4954**	**1,355.4954**	**0.1274**	**0.0000**	**1,358.5599**

	ROG	NOx	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	11.71	0.00	9.46	17.88	0.00	10.46	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	1-7-2019	4-6-2019	0.9672	0.9672
2	4-7-2019	7-6-2019	1.6506	1.6506
3	7-7-2019	10-6-2019	1.4377	1.4377
4	10-7-2019	1-6-2020	1.4420	1.4420
5	1-7-2020	4-6-2020	1.3060	1.3060
6	4-7-2020	7-6-2020	1.3777	1.3777
7	7-7-2020	10-6-2020	1.8164	1.8164
8	10-7-2020	1-6-2021	1.8209	1.8209
9	1-7-2021	4-6-2021	1.6627	1.6627
10	4-7-2021	7-6-2021	0.7108	0.7108
		Highest	1.8209	1.8209

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	2.7109	0.1991	3.2601	1.2000e-003		0.0307	0.0307		0.0307	0.0307	0.0000	193.2218	193.2218	8.6600e-003	3.4500e-003	194.4655
Energy	0.0409	0.3492	0.1486	2.2300e-003		0.0282	0.0282		0.0282	0.0282	0.0000	1,104.9744	1,104.9744	0.0367	0.0134	1,109.8839
Mobile	0.8373	4.2991	10.7795	0.0385	3.1450	0.0324	3.1773	0.8430	0.0302	0.8732	0.0000	3,552.8935	3,552.8935	0.1864	0.0000	3,557.5529
Waste						0.0000	0.0000		0.0000	0.0000	47.8632	0.0000	47.8632	2.8286	0.0000	118.5792
Water						0.0000	0.0000		0.0000	0.0000	8.8619	191.1295	199.9914	0.9181	0.0231	229.8349
Total	**3.5891**	**4.8474**	**14.1881**	**0.0419**	**3.1450**	**0.0913**	**3.2363**	**0.8430**	**0.0891**	**0.9322**	**56.7252**	**5,042.2192**	**5,098.9444**	**3.9784**	**0.0400**	**5,210.3163**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	2.7109	0.1991	3.2601	1.2000e-003		0.0307	0.0307		0.0307	0.0307	0.0000	193.2218	193.2218	8.6600e-003	3.4500e-003	194.4655
Energy	0.0409	0.3492	0.1486	2.2300e-003		0.0282	0.0282		0.0282	0.0282	0.0000	1,104.9744	1,104.9744	0.0367	0.0134	1,109.8839
Mobile	0.8373	4.2991	10.7795	0.0385	3.1450	0.0324	3.1773	0.8430	0.0302	0.8732	0.0000	3,552.8935	3,552.8935	0.1864	0.0000	3,557.5529
Waste						0.0000	0.0000		0.0000	0.0000	47.8632	0.0000	47.8632	2.8286	0.0000	118.5792
Water						0.0000	0.0000		0.0000	0.0000	8.8619	191.1295	199.9914	0.9181	0.0231	229.8349
Total	**3.5891**	**4.8474**	**14.1881**	**0.0419**	**3.1450**	**0.0913**	**3.2363**	**0.8430**	**0.0891**	**0.9322**	**56.7252**	**5,042.2192**	**5,098.9444**	**3.9784**	**0.0400**	**5,210.3163**

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

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	2/16/2019	3/15/2019	5	20	
2	Grading	Grading	3/16/2019	5/17/2019	5	45	
3	Building Construction	Building Construction	5/18/2019	4/16/2021	5	500	
4	Architectural Coating	Architectural Coating	6/22/2020	6/4/2021	5	250	
5	Paving	Paving	4/17/2021	6/4/2021	5	35	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 112.5

Acres of Paving: 9.35

Residential Indoor: 944,460; Residential Outdoor: 314,820; Non-Residential Indoor: 375; Non-Residential Outdoor: 125; Striped Parking Area: 24,936 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Grading	Excavators	2	8.00	158	0.38
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Scrapers	2	8.00	367	0.48
Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Architectural Coating	Air Compressors	1	6.00	78	0.48
Paving	Pavers	2	8.00	130	0.42
Paving	Paving Equipment	2	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation	7	18.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	522.00	136.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	104.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

3.2 Site Preparation - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.1807	0.0000	0.1807	0.0993	0.0000	0.0993	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0434	0.4557	0.2206	3.8000e-004		0.0239	0.0239		0.0220	0.0220	0.0000	34.1687	34.1687	0.0108	0.0000	34.4390
Total	**0.0434**	**0.4557**	**0.2206**	**3.8000e-004**	**0.1807**	**0.0239**	**0.2046**	**0.0993**	**0.0220**	**0.1213**	**0.0000**	**34.1687**	**34.1687**	**0.0108**	**0.0000**	**34.4390**

3.2 Site Preparation - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	7.1000e-004	5.7000e-004	6.2500e-003	2.0000e-005	1.4500e-003	1.0000e-005	1.4600e-003	3.9000e-004	1.0000e-005	4.0000e-004	0.0000	1.4032	1.4032	5.0000e-005	0.0000	1.4044
Total	**7.1000e-004**	**5.7000e-004**	**6.2500e-003**	**2.0000e-005**	**1.4500e-003**	**1.0000e-005**	**1.4600e-003**	**3.9000e-004**	**1.0000e-005**	**4.0000e-004**	**0.0000**	**1.4032**	**1.4032**	**5.0000e-005**	**0.0000**	**1.4044**

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					0.0813	0.0000	0.0813	0.0447	0.0000	0.0447	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0434	0.4557	0.2206	3.8000e-004		0.0239	0.0239		0.0220	0.0220	0.0000	34.1687	34.1687	0.0108	0.0000	34.4389
Total	**0.0434**	**0.4557**	**0.2206**	**3.8000e-004**	**0.0813**	**0.0239**	**0.1052**	**0.0447**	**0.0220**	**0.0667**	**0.0000**	**34.1687**	**34.1687**	**0.0108**	**0.0000**	**34.4389**

3.2 Site Preparation - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	7.1000e-004	5.7000e-004	6.2500e-003	2.0000e-005	1.4500e-003	1.0000e-005	1.4600e-003	3.9000e-004	1.0000e-005	4.0000e-004	0.0000	1.4032	1.4032	5.0000e-005	0.0000	1.4044
Total	**7.1000e-004**	**5.7000e-004**	**6.2500e-003**	**2.0000e-005**	**1.4500e-003**	**1.0000e-005**	**1.4600e-003**	**3.9000e-004**	**1.0000e-005**	**4.0000e-004**	**0.0000**	**1.4032**	**1.4032**	**5.0000e-005**	**0.0000**	**1.4044**

3.3 Grading - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.1952	0.0000	0.1952	0.0809	0.0000	0.0809	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1066	1.2267	0.7510	1.4000e-003		0.0536	0.0536		0.0493	0.0493	0.0000	125.3280	125.3280	0.0397	0.0000	126.3193
Total	**0.1066**	**1.2267**	**0.7510**	**1.4000e-003**	**0.1952**	**0.0536**	**0.2488**	**0.0809**	**0.0493**	**0.1302**	**0.0000**	**125.3280**	**125.3280**	**0.0397**	**0.0000**	**126.3193**

3.3 Grading - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.7900e-003	1.4200e-003	0.0156	4.0000e-005	3.6200e-003	3.0000e-005	3.6600e-003	9.6000e-004	3.0000e-005	9.9000e-004	0.0000	3.5080	3.5080	1.2000e-004	0.0000	3.5111
Total	**1.7900e-003**	**1.4200e-003**	**0.0156**	**4.0000e-005**	**3.6200e-003**	**3.0000e-005**	**3.6600e-003**	**9.6000e-004**	**3.0000e-005**	**9.9000e-004**	**0.0000**	**3.5080**	**3.5080**	**1.2000e-004**	**0.0000**	**3.5111**

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					0.0878	0.0000	0.0878	0.0364	0.0000	0.0364	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1066	1.2267	0.7510	1.4000e-003		0.0536	0.0536		0.0493	0.0493	0.0000	125.3278	125.3278	0.0397	0.0000	126.3191
Total	**0.1066**	**1.2267**	**0.7510**	**1.4000e-003**	**0.0878**	**0.0536**	**0.1414**	**0.0364**	**0.0493**	**0.0857**	**0.0000**	**125.3278**	**125.3278**	**0.0397**	**0.0000**	**126.3191**

3.3 Grading - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.7900e-003	1.4200e-003	0.0156	4.0000e-005	3.6200e-003	3.0000e-005	3.6600e-003	9.6000e-004	3.0000e-005	9.9000e-004	0.0000	3.5080	3.5080	1.2000e-004	0.0000	3.5111
Total	**1.7900e-003**	**1.4200e-003**	**0.0156**	**4.0000e-005**	**3.6200e-003**	**3.0000e-005**	**3.6600e-003**	**9.6000e-004**	**3.0000e-005**	**9.9000e-004**	**0.0000**	**3.5080**	**3.5080**	**1.2000e-004**	**0.0000**	**3.5111**

3.4 Building Construction - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1913	1.7074	1.3903	2.1800e-003		0.1045	0.1045		0.0982	0.0982	0.0000	190.4344	190.4344	0.0464	0.0000	191.5942
Total	**0.1913**	**1.7074**	**1.3903**	**2.1800e-003**		**0.1045**	**0.1045**		**0.0982**	**0.0982**	**0.0000**	**190.4344**	**190.4344**	**0.0464**	**0.0000**	**191.5942**

3.4 Building Construction - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0483	1.3376	0.3655	2.9800e-003	0.0734	8.6300e-003	0.0820	0.0212	8.2500e-003	0.0294	0.0000	288.0823	288.0823	0.0189	0.0000	288.5537
Worker	0.1678	0.1337	1.4685	3.6500e-003	0.3405	3.0700e-003	0.3436	0.0905	2.8300e-003	0.0933	0.0000	329.6130	329.6130	0.0115	0.0000	329.9015
Total	**0.2161**	**1.4713**	**1.8340**	**6.6300e-003**	**0.4139**	**0.0117**	**0.4256**	**0.1116**	**0.0111**	**0.1227**	**0.0000**	**617.6953**	**617.6953**	**0.0304**	**0.0000**	**618.4552**

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	0.1913	1.7074	1.3903	2.1800e-003		0.1045	0.1045		0.0982	0.0982	0.0000	190.4342	190.4342	0.0464	0.0000	191.5940
Total	**0.1913**	**1.7074**	**1.3903**	**2.1800e-003**		**0.1045**	**0.1045**		**0.0982**	**0.0982**	**0.0000**	**190.4342**	**190.4342**	**0.0464**	**0.0000**	**191.5940**

3.4 Building Construction - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0483	1.3376	0.3655	2.9800e-003	0.0734	8.6300e-003	0.0820	0.0212	8.2500e-003	0.0294	0.0000	288.0823	288.0823	0.0189	0.0000	288.5537
Worker	0.1678	0.1337	1.4685	3.6500e-003	0.3405	3.0700e-003	0.3436	0.0905	2.8300e-003	0.0933	0.0000	329.6130	329.6130	0.0115	0.0000	329.9015
Total	**0.2161**	**1.4713**	**1.8340**	**6.6300e-003**	**0.4139**	**0.0117**	**0.4256**	**0.1116**	**0.0111**	**0.1227**	**0.0000**	**617.6953**	**617.6953**	**0.0304**	**0.0000**	**618.4552**

3.4 Building Construction - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.2777	2.5134	2.2072	3.5300e-003		0.1463	0.1463		0.1376	0.1376	0.0000	303.4091	303.4091	0.0740	0.0000	305.2596
Total	**0.2777**	**2.5134**	**2.2072**	**3.5300e-003**		**0.1463**	**0.1463**		**0.1376**	**0.1376**	**0.0000**	**303.4091**	**303.4091**	**0.0740**	**0.0000**	**305.2596**

3.4 Building Construction - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0668	1.9813	0.5366	4.7800e-003	0.1187	9.4700e-003	0.1282	0.0343	9.0600e-003	0.0433	0.0000	462.8175	462.8175	0.0289	0.0000	463.5390
Worker	0.2499	0.1927	2.1519	5.7200e-003	0.5507	4.8100e-003	0.5555	0.1463	4.4300e-003	0.1507	0.0000	516.8888	516.8888	0.0166	0.0000	517.3031
Total	**0.3167**	**2.1740**	**2.6885**	**0.0105**	**0.6694**	**0.0143**	**0.6837**	**0.1806**	**0.0135**	**0.1940**	**0.0000**	**979.7062**	**979.7062**	**0.0454**	**0.0000**	**980.8421**

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	0.2777	2.5134	2.2072	3.5300e-003		0.1463	0.1463		0.1376	0.1376	0.0000	303.4087	303.4087	0.0740	0.0000	305.2592
Total	**0.2777**	**2.5134**	**2.2072**	**3.5300e-003**		**0.1463**	**0.1463**		**0.1376**	**0.1376**	**0.0000**	**303.4087**	**303.4087**	**0.0740**	**0.0000**	**305.2592**

3.4 Building Construction - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0668	1.9813	0.5366	4.7800e-003	0.1187	9.4700e-003	0.1282	0.0343	9.0600e-003	0.0433	0.0000	462.8175	462.8175	0.0289	0.0000	463.5390
Worker	0.2499	0.1927	2.1519	5.7200e-003	0.5507	4.8100e-003	0.5555	0.1463	4.4300e-003	0.1507	0.0000	516.8888	516.8888	0.0166	0.0000	517.3031
Total	**0.3167**	**2.1740**	**2.6885**	**0.0105**	**0.6694**	**0.0143**	**0.6837**	**0.1806**	**0.0135**	**0.1940**	**0.0000**	**979.7062**	**979.7062**	**0.0454**	**0.0000**	**980.8421**

3.4 Building Construction - 2021

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	0.0722	0.6624	0.6299	1.0200e-003		0.0364	0.0364		0.0343	0.0343	0.0000	88.0222	88.0222	0.0212	0.0000	88.5531
Total	**0.0722**	**0.6624**	**0.6299**	**1.0200e-003**		**0.0364**	**0.0364**		**0.0343**	**0.0343**	**0.0000**	**88.0222**	**88.0222**	**0.0212**	**0.0000**	**88.5531**

3.4 Building Construction - 2021

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	0.0166	0.5224	0.1419	1.3700e-003	0.0344	1.0900e-003	0.0355	9.9400e-003	1.0500e-003	0.0110	0.0000	133.2112	133.2112	8.0200e-003	0.0000	133.4117
Worker	0.0675	0.0503	0.5730	1.6100e-003	0.1598	1.3500e-003	0.1611	0.0424	1.2400e-003	0.0437	0.0000	145.1770	145.1770	4.3400e-003	0.0000	145.2856
Total	**0.0840**	**0.5727**	**0.7149**	**2.9800e-003**	**0.1942**	**2.4400e-003**	**0.1966**	**0.0524**	**2.2900e-003**	**0.0547**	**0.0000**	**278.3882**	**278.3882**	**0.0124**	**0.0000**	**278.6973**

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	0.0722	0.6624	0.6299	1.0200e-003		0.0364	0.0364		0.0343	0.0343	0.0000	88.0221	88.0221	0.0212	0.0000	88.5530
Total	**0.0722**	**0.6624**	**0.6299**	**1.0200e-003**		**0.0364**	**0.0364**		**0.0343**	**0.0343**	**0.0000**	**88.0221**	**88.0221**	**0.0212**	**0.0000**	**88.5530**

3.4 Building Construction - 2021

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	0.0166	0.5224	0.1419	1.3700e-003	0.0344	1.0900e-003	0.0355	9.9400e-003	1.0500e-003	0.0110	0.0000	133.2112	133.2112	8.0200e-003	0.0000	133.4117
Worker	0.0675	0.0503	0.5730	1.6100e-003	0.1598	1.3500e-003	0.1611	0.0424	1.2400e-003	0.0437	0.0000	145.1770	145.1770	4.3400e-003	0.0000	145.2856
Total	**0.0840**	**0.5727**	**0.7149**	**2.9800e-003**	**0.1942**	**2.4400e-003**	**0.1966**	**0.0524**	**2.2900e-003**	**0.0547**	**0.0000**	**278.3882**	**278.3882**	**0.0124**	**0.0000**	**278.6973**

3.5 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	0.8920					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0168	0.1170	0.1273	2.1000e-004		7.7100e-003	7.7100e-003		7.7100e-003	7.7100e-003	0.0000	17.7451	17.7451	1.3700e-003	0.0000	17.7795
Total	**0.9088**	**0.1170**	**0.1273**	**2.1000e-004**		**7.7100e-003**	**7.7100e-003**		**7.7100e-003**	**7.7100e-003**	**0.0000**	**17.7451**	**17.7451**	**1.3700e-003**	**0.0000**	**17.7795**

3.5 Architectural Coating - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0264	0.0204	0.2275	6.0000e-004	0.0582	5.1000e-004	0.0587	0.0155	4.7000e-004	0.0159	0.0000	54.6353	54.6353	1.7500e-003	0.0000	54.6791
Total	**0.0264**	**0.0204**	**0.2275**	**6.0000e-004**	**0.0582**	**5.1000e-004**	**0.0587**	**0.0155**	**4.7000e-004**	**0.0159**	**0.0000**	**54.6353**	**54.6353**	**1.7500e-003**	**0.0000**	**54.6791**

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	0.8920					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0168	0.1170	0.1273	2.1000e-004		7.7100e-003	7.7100e-003		7.7100e-003	7.7100e-003	0.0000	17.7451	17.7451	1.3700e-003	0.0000	17.7794
Total	**0.9088**	**0.1170**	**0.1273**	**2.1000e-004**		**7.7100e-003**	**7.7100e-003**		**7.7100e-003**	**7.7100e-003**	**0.0000**	**17.7451**	**17.7451**	**1.3700e-003**	**0.0000**	**17.7794**

3.5 Architectural Coating - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0264	0.0204	0.2275	6.0000e-004	0.0582	5.1000e-004	0.0587	0.0155	4.7000e-004	0.0159	0.0000	54.6353	54.6353	1.7500e-003	0.0000	54.6791
Total	**0.0264**	**0.0204**	**0.2275**	**6.0000e-004**	**0.0582**	**5.1000e-004**	**0.0587**	**0.0155**	**4.7000e-004**	**0.0159**	**0.0000**	**54.6353**	**54.6353**	**1.7500e-003**	**0.0000**	**54.6791**

3.5 Architectural Coating - 2021

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	0.7123					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0122	0.0847	0.1009	1.6000e-004		5.2200e-003	5.2200e-003		5.2200e-003	5.2200e-003	0.0000	14.1706	14.1706	9.7000e-004	0.0000	14.1949
Total	**0.7244**	**0.0847**	**0.1009**	**1.6000e-004**		**5.2200e-003**	**5.2200e-003**		**5.2200e-003**	**5.2200e-003**	**0.0000**	**14.1706**	**14.1706**	**9.7000e-004**	**0.0000**	**14.1949**

3.5 Architectural Coating - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0196	0.0146	0.1667	4.7000e-004	0.0465	3.9000e-004	0.0469	0.0124	3.6000e-004	0.0127	0.0000	42.2445	42.2445	1.2600e-003	0.0000	42.2761
Total	**0.0196**	**0.0146**	**0.1667**	**4.7000e-004**	**0.0465**	**3.9000e-004**	**0.0469**	**0.0124**	**3.6000e-004**	**0.0127**	**0.0000**	**42.2445**	**42.2445**	**1.2600e-003**	**0.0000**	**42.2761**

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	0.7123					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0122	0.0847	0.1009	1.6000e-004		5.2200e-003	5.2200e-003		5.2200e-003	5.2200e-003	0.0000	14.1705	14.1705	9.7000e-004	0.0000	14.1949
Total	**0.7244**	**0.0847**	**0.1009**	**1.6000e-004**		**5.2200e-003**	**5.2200e-003**		**5.2200e-003**	**5.2200e-003**	**0.0000**	**14.1705**	**14.1705**	**9.7000e-004**	**0.0000**	**14.1949**

3.5 Architectural Coating - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0196	0.0146	0.1667	4.7000e-004	0.0465	3.9000e-004	0.0469	0.0124	3.6000e-004	0.0127	0.0000	42.2445	42.2445	1.2600e-003	0.0000	42.2761
Total	**0.0196**	**0.0146**	**0.1667**	**4.7000e-004**	**0.0465**	**3.9000e-004**	**0.0469**	**0.0124**	**3.6000e-004**	**0.0127**	**0.0000**	**42.2445**	**42.2445**	**1.2600e-003**	**0.0000**	**42.2761**

3.6 Paving - 2021

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	0.0220	0.2261	0.2564	4.0000e-004		0.0119	0.0119		0.0109	0.0109	0.0000	35.0411	35.0411	0.0113	0.0000	35.3244
Paving	0.0123					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0342**	**0.2261**	**0.2564**	**4.0000e-004**		**0.0119**	**0.0119**		**0.0109**	**0.0109**	**0.0000**	**35.0411**	**35.0411**	**0.0113**	**0.0000**	**35.3244**

3.6 Paving - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	8.9000e-004	6.7000e-004	7.5800e-003	2.0000e-005	2.1100e-003	2.0000e-005	2.1300e-003	5.6000e-004	2.0000e-005	5.8000e-004	0.0000	1.9212	1.9212	6.0000e-005	0.0000	1.9226
Total	**8.9000e-004**	**6.7000e-004**	**7.5800e-003**	**2.0000e-005**	**2.1100e-003**	**2.0000e-005**	**2.1300e-003**	**5.6000e-004**	**2.0000e-005**	**5.8000e-004**	**0.0000**	**1.9212**	**1.9212**	**6.0000e-005**	**0.0000**	**1.9226**

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	0.0220	0.2261	0.2564	4.0000e-004		0.0119	0.0119		0.0109	0.0109	0.0000	35.0411	35.0411	0.0113	0.0000	35.3244
Paving	0.0123					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0342**	**0.2261**	**0.2564**	**4.0000e-004**		**0.0119**	**0.0119**		**0.0109**	**0.0109**	**0.0000**	**35.0411**	**35.0411**	**0.0113**	**0.0000**	**35.3244**

3.6 Paving - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	8.9000e-004	6.7000e-004	7.5800e-003	2.0000e-005	2.1100e-003	2.0000e-005	2.1300e-003	5.6000e-004	2.0000e-005	5.8000e-004	0.0000	1.9212	1.9212	6.0000e-005	0.0000	1.9226
Total	**8.9000e-004**	**6.7000e-004**	**7.5800e-003**	**2.0000e-005**	**2.1100e-003**	**2.0000e-005**	**2.1300e-003**	**5.6000e-004**	**2.0000e-005**	**5.8000e-004**	**0.0000**	**1.9212**	**1.9212**	**6.0000e-005**	**0.0000**	**1.9226**

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	0.8373	4.2991	10.7795	0.0385	3.1450	0.0324	3.1773	0.8430	0.0302	0.8732	0.0000	3,552.8935	3,552.8935	0.1864	0.0000	3,557.5529
Unmitigated	0.8373	4.2991	10.7795	0.0385	3.1450	0.0324	3.1773	0.8430	0.0302	0.8732	0.0000	3,552.8935	3,552.8935	0.1864	0.0000	3,557.5529

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Apartments Low Rise	2,108.80	2,291.20	1942.40	5,995,737	5,995,737
City Park	0.00	0.00	0.00		
Condo/Townhouse	348.60	340.20	290.40	963,044	963,044
Parking Lot	0.00	0.00	0.00		
Recreational Swimming Pool	27.06	7.28	10.88	39,616	39,616
Single Family Housing	456.96	475.68	413.76	1,287,889	1,287,889
Total	2,941.42	3,114.36	2,657.44	8,286,285	8,286,285

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Apartments Low Rise	10.80	7.30	7.50	40.20	19.20	40.60	86	11	3
City Park	9.50	7.30	7.30	33.00	48.00	19.00	66	28	6
Condo/Townhouse	10.80	7.30	7.50	40.20	19.20	40.60	86	11	3
Parking Lot	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0
Recreational Swimming Pool	9.50	7.30	7.30	33.00	48.00	19.00	52	39	9
Single Family Housing	10.80	7.30	7.50	40.20	19.20	40.60	86	11	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Apartments Low Rise	0.546501	0.044961	0.204016	0.120355	0.015740	0.006196	0.020131	0.030678	0.002515	0.002201	0.005142	0.000687	0.000876
City Park	0.546501	0.044961	0.204016	0.120355	0.015740	0.006196	0.020131	0.030678	0.002515	0.002201	0.005142	0.000687	0.000876
Condo/Townhouse	0.546501	0.044961	0.204016	0.120355	0.015740	0.006196	0.020131	0.030678	0.002515	0.002201	0.005142	0.000687	0.000876
Parking Lot	0.546501	0.044961	0.204016	0.120355	0.015740	0.006196	0.020131	0.030678	0.002515	0.002201	0.005142	0.000687	0.000876
Recreational Swimming Pool	0.546501	0.044961	0.204016	0.120355	0.015740	0.006196	0.020131	0.030678	0.002515	0.002201	0.005142	0.000687	0.000876
Single Family Housing	0.546501	0.044961	0.204016	0.120355	0.015740	0.006196	0.020131	0.030678	0.002515	0.002201	0.005142	0.000687	0.000876

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	700.5781	700.5781	0.0289	5.9800e-003	703.0845
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	700.5781	700.5781	0.0289	5.9800e-003	703.0845
NaturalGas Mitigated	0.0409	0.3492	0.1486	2.2300e-003		0.0282	0.0282		0.0282	0.0282	0.0000	404.3963	404.3963	7.7500e-003	7.4100e-003	406.7994
NaturalGas Unmitigated	0.0409	0.3492	0.1486	2.2300e-003		0.0282	0.0282		0.0282	0.0282	0.0000	404.3963	404.3963	7.7500e-003	7.4100e-003	406.7994

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Apartments Low Rise	5.22873e+006	0.0282	0.2409	0.1025	1.5400e-003		0.0195	0.0195		0.0195	0.0195	0.0000	279.0248	279.0248	5.3500e-003	5.1200e-003	280.6829
City Park	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Condo/Townhouse	1.03059e+006	5.5600e-003	0.0475	0.0202	3.0000e-004		3.8400e-003	3.8400e-003		3.8400e-003	3.8400e-003	0.0000	54.9964	54.9964	1.0500e-003	1.0100e-003	55.3232
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Recreational Swimming Pool	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Single Family Housing	1.31878e+006	7.1100e-003	0.0608	0.0259	3.9000e-004		4.9100e-003	4.9100e-003		4.9100e-003	4.9100e-003	0.0000	70.3751	70.3751	1.3500e-003	1.2900e-003	70.7933
Total		**0.0409**	**0.3492**	**0.1486**	**2.2300e-003**		**0.0282**	**0.0282**		**0.0282**	**0.0282**	**0.0000**	**404.3963**	**404.3963**	**7.7500e-003**	**7.4200e-003**	**406.7994**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Apartments Low Rise	5.22873e+006	0.0282	0.2409	0.1025	1.5400e-003		0.0195	0.0195		0.0195	0.0195	0.0000	279.0248	279.0248	5.3500e-003	5.1200e-003	280.6829
City Park	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Condo/Townhouse	1.03059e+006	5.5600e-003	0.0475	0.0202	3.0000e-004		3.8400e-003	3.8400e-003		3.8400e-003	3.8400e-003	0.0000	54.9964	54.9964	1.0500e-003	1.0100e-003	55.3232
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Recreational Swimming Pool	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Single Family Housing	1.31878e+006	7.1100e-003	0.0608	0.0259	3.9000e-004		4.9100e-003	4.9100e-003		4.9100e-003	4.9100e-003	0.0000	70.3751	70.3751	1.3500e-003	1.2900e-003	70.7933
Total		**0.0409**	**0.3492**	**0.1486**	**2.2300e-003**		**0.0282**	**0.0282**		**0.0282**	**0.0282**	**0.0000**	**404.3963**	**404.3963**	**7.7500e-003**	**7.4200e-003**	**406.7994**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Apartments Low Rise	1.35692e+006	432.3453	0.0179	3.6900e-003	433.8920
City Park	0	0.0000	0.0000	0.0000	0.0000
Condo/Townhouse	302396	96.3500	3.9800e-003	8.2000e-004	96.6947
Parking Lot	145460	46.3467	1.9100e-003	4.0000e-004	46.5125
Recreational Swimming Pool	0	0.0000	0.0000	0.0000	0.0000
Single Family Housing	393998	125.5362	5.1800e-003	1.0700e-003	125.9853
Total		**700.5781**	**0.0289**	**5.9800e-003**	**703.0845**

5.3 Energy by Land Use - Electricity

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Apartments Low Rise	1.35692e +006	432.3453	0.0179	3.6900e-003	433.8920
City Park	0	0.0000	0.0000	0.0000	0.0000
Condo/Townhouse	302396	96.3500	3.9800e-003	8.2000e-004	96.6947
Parking Lot	145460	46.3467	1.9100e-003	4.0000e-004	46.5125
Recreational Swimming Pool	0	0.0000	0.0000	0.0000	0.0000
Single Family Housing	393998	125.5362	5.1800e-003	1.0700e-003	125.9853
Total		**700.5781**	**0.0289**	**5.9800e-003**	**703.0845**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	2.7109	0.1991	3.2601	1.2000e-003		0.0307	0.0307		0.0307	0.0307	0.0000	193.2218	193.2218	8.6600e-003	3.4500e-003	194.4655
Unmitigated	2.7109	0.1991	3.2601	1.2000e-003		0.0307	0.0307		0.0307	0.0307	0.0000	193.2218	193.2218	8.6600e-003	3.4500e-003	194.4655

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	0.7443					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	1.8506					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	0.0190	0.1623	0.0691	1.0400e-003		0.0131	0.0131		0.0131	0.0131	0.0000	188.0120	188.0120	3.6000e-003	3.4500e-003	189.1293
Landscaping	0.0970	0.0368	3.1910	1.7000e-004		0.0176	0.0176		0.0176	0.0176	0.0000	5.2098	5.2098	5.0600e-003	0.0000	5.3362
Total	**2.7109**	**0.1991**	**3.2601**	**1.2100e-003**		**0.0307**	**0.0307**		**0.0307**	**0.0307**	**0.0000**	**193.2218**	**193.2218**	**8.6600e-003**	**3.4500e-003**	**194.4655**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.7443					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	1.8506					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	0.0190	0.1623	0.0691	1.0400e-003		0.0131	0.0131		0.0131	0.0131	0.0000	188.0120	188.0120	3.6000e-003	3.4500e-003	189.1293
Landscaping	0.0970	0.0368	3.1910	1.7000e-004		0.0176	0.0176		0.0176	0.0176	0.0000	5.2098	5.2098	5.0600e-003	0.0000	5.3362
Total	**2.7109**	**0.1991**	**3.2601**	**1.2100e-003**		**0.0307**	**0.0307**		**0.0307**	**0.0307**	**0.0000**	**193.2218**	**193.2218**	**8.6600e-003**	**3.4500e-003**	**194.4655**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	199.9914	0.9181	0.0231	229.8349
Unmitigated	199.9914	0.9181	0.0231	229.8349

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Apartments Low Rise	20.8493 / 13.1441	139.6421	0.6849	0.0172	161.8827
City Park	0 / 3.64593	12.9062	5.3000e-004	1.1000e-004	12.9524
Condo/Townhouse	3.90924 / 2.46452	26.1829	0.1284	3.2200e-003	30.3530
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Recreational Swimming Pool	0.0473145 / 0.0289992	0.3140	1.5500e-003	4.0000e-005	0.3644
Single Family Housing	3.12739 / 1.97162	20.9463	0.1027	2.5800e-003	24.2824
Total		**199.9914**	**0.9181**	**0.0231**	**229.8349**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Apartments Low Rise	20.8493 / 13.1441	139.6421	0.6849	0.0172	161.8827
City Park	0 / 3.64593	12.9062	5.3000e-004	1.1000e-004	12.9524
Condo/Townhouse	3.90924 / 2.46452	26.1829	0.1284	3.2200e-003	30.3530
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Recreational Swimming Pool	0.0473145 / 0.0289992	0.3140	1.5500e-003	4.0000e-005	0.3644
Single Family Housing	3.12739 / 1.97162	20.9463	0.1027	2.5800e-003	24.2824
Total		**199.9914**	**0.9181**	**0.0231**	**229.8349**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	47.8632	2.8286	0.0000	118.5792
Unmitigated	47.8632	2.8286	0.0000	118.5792

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments Low Rise	147.2	29.8803	1.7659	0.0000	74.0271
City Park	0.26	0.0528	3.1200e-003	0.0000	0.1308
Condo/Townhouse	27.6	5.6026	0.3311	0.0000	13.8801
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Recreational Swimming Pool	4.56	0.9256	0.0547	0.0000	2.2932
Single Family Housing	56.17	11.4020	0.6738	0.0000	28.2480
Total		**47.8632**	**2.8286**	**0.0000**	**118.5791**

8.2 Waste by Land Use

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments Low Rise	147.2	29.8803	1.7659	0.0000	74.0271
City Park	0.26	0.0528	3.1200e-003	0.0000	0.1308
Condo/Townhouse	27.6	5.6026	0.3311	0.0000	13.8801
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Recreational Swimming Pool	4.56	0.9256	0.0547	0.0000	2.2932
Single Family Housing	56.17	11.4020	0.6738	0.0000	28.2480
Total		**47.8632**	**2.8286**	**0.0000**	**118.5791**

9.0 Operational Offroad

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

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

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

Boilers

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

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

20th and Rancho

Los Angeles-Mojave Desert County, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Parking Lot	1,039.00	Space	9.35	415,600.00	0
City Park	3.06	Acre	3.06	133,345.00	0
Recreational Swimming Pool	0.80	1000sqft	0.02	800.00	0
Apartments Low Rise	320.00	Dwelling Unit	13.70	320,000.00	915
Condo/Townhouse	60.00	Dwelling Unit	2.90	60,000.00	172
Single Family Housing	48.00	Dwelling Unit	3.03	86,400.00	137

1.2 Other Project Characteristics

Urbanization Urban | **Wind Speed (m/s)** 2.2 | **Precipitation Freq (Days)** 33

Climate Zone 9 | **Operational Year** 2022

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 - Source: site plan, acreage included in residential component; assumed club house was 250 sf and swimming pool was 20x40

Construction Phase - Architectural coating phase updated to reflect more accurate construction schedule

Architectural Coating - CalGreen and AVAQMD Rule 1113

Vehicle Trips - City park land use used as proxy for usable open space

Woodstoves - No woodburning fireplaces or stoves onsite per client

Construction Off-road Equipment Mitigation -

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	EF_Nonresidential_Exterior	250.00	50.00
tblArchitecturalCoating	EF_Nonresidential_Interior	250.00	50.00
tblArchitecturalCoating	EF_Residential_Exterior	250.00	50.00
tblArchitecturalCoating	EF_Residential_Interior	250.00	50.00
tblConstructionPhase	NumDays	35.00	250.00
tblFireplaces	FireplaceWoodMass	3,078.40	0.00
tblFireplaces	FireplaceWoodMass	3,078.40	0.00
tblFireplaces	FireplaceWoodMass	3,078.40	0.00
tblFireplaces	NumberGas	33.00	36.30
tblFireplaces	NumberNoFireplace	6.00	6.60
tblFireplaces	NumberWood	112.00	0.00
tblFireplaces	NumberWood	21.00	0.00
tblFireplaces	NumberWood	16.80	0.00
tblLandUse	LandUseSquareFeet	133,293.60	133,345.00
tblLandUse	LotAcreage	20.00	13.70
tblLandUse	LotAcreage	3.75	2.90
tblLandUse	LotAcreage	15.58	3.03
tblVehicleTrips	ST_TR	22.75	0.00

tblVehicleTrips	SU_TR	16.74	0.00
tblVehicleTrips	WD_TR	1.89	0.00
tblWoodstoves	NumberCatalytic	16.00	0.00
tblWoodstoves	NumberCatalytic	3.00	0.00
tblWoodstoves	NumberCatalytic	2.40	0.00
tblWoodstoves	NumberNoncatalytic	16.00	0.00
tblWoodstoves	NumberNoncatalytic	3.00	0.00
tblWoodstoves	NumberNoncatalytic	2.40	0.00
tblWoodstoves	WoodstoveDayYear	82.00	0.00
tblWoodstoves	WoodstoveDayYear	82.00	0.00
tblWoodstoves	WoodstoveDayYear	82.00	0.00
tblWoodstoves	WoodstoveWoodMass	3,019.20	0.00
tblWoodstoves	WoodstoveWoodMass	3,019.20	0.00
tblWoodstoves	WoodstoveWoodMass	3,019.20	0.00

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2019	5.0320	54.5759	40.5713	0.1112	18.2141	2.3917	20.6058	9.9699	2.2003	12.1702	0.0000	11,239.9537	11,239.9537	1.9489	0.0000	11,266.0539
2020	17.9986	37.2555	43.3780	0.1215	6.0634	1.3439	7.4073	1.6292	1.2706	2.8997	0.0000	12,219.9064	12,219.9064	1.0550	0.0000	12,246.2810
2021	17.5225	33.8677	41.0611	0.1194	6.0634	1.1237	7.1871	1.6292	1.0618	2.6910	0.0000	12,016.8397	12,016.8397	1.0192	0.0000	12,042.3190
Maximum	**17.9986**	**54.5759**	**43.3780**	**0.1215**	**18.2141**	**2.3917**	**20.6058**	**9.9699**	**2.2003**	**12.1702**	**0.0000**	**12,219.9064**	**12,219.9064**	**1.9489**	**0.0000**	**12,246.2810**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2019	5.0320	54.5759	40.5713	0.1112	8.2777	2.3917	10.6694	4.5080	2.2003	6.7084	0.0000	11,239.9537	11,239.9537	1.9489	0.0000	11,266.0539
2020	17.9986	37.2555	43.3780	0.1215	6.0634	1.3439	7.4073	1.6292	1.2706	2.8997	0.0000	12,219.9064	12,219.9064	1.0550	0.0000	12,246.2810
2021	17.5225	33.8677	41.0611	0.1194	6.0634	1.1237	7.1871	1.6292	1.0618	2.6910	0.0000	12,016.8397	12,016.8397	1.0192	0.0000	12,042.3190
Maximum	**17.9986**	**54.5759**	**43.3780**	**0.1215**	**8.2777**	**2.3917**	**10.6694**	**4.5080**	**2.2003**	**6.7084**	**0.0000**	**12,219.9064**	**12,219.9064**	**1.9489**	**0.0000**	**12,246.2810**

	ROG	NOx	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	32.75	0.00	28.23	41.29	0.00	30.75	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	15.7599	4.3683	37.1401	0.0272		0.5158	0.5158		0.5158	0.5158	0.0000	5,118.6322	5,118.6322	0.1588	0.0927	5,150.2190
Energy	0.2239	1.9134	0.8142	0.0122		0.1547	0.1547		0.1547	0.1547		2,442.5787	2,442.5787	0.0468	0.0448	2,457.0937
Mobile	5.2237	24.4026	65.7847	0.2352	18.9195	0.1906	19.1101	5.0632	0.1778	5.2410		23,939.9253	23,939.9253	1.2184		23,970.3843
Total	**21.2075**	**30.6842**	**103.7391**	**0.2745**	**18.9195**	**0.8611**	**19.7806**	**5.0632**	**0.8483**	**5.9115**	**0.0000**	**31,501.1362**	**31,501.1362**	**1.4240**	**0.1375**	**31,577.6970**

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	15.7599	4.3683	37.1401	0.0272		0.5158	0.5158		0.5158	0.5158	0.0000	5,118.6322	5,118.6322	0.1588	0.0927	5,150.2190
Energy	0.2239	1.9134	0.8142	0.0122		0.1547	0.1547		0.1547	0.1547		2,442.5787	2,442.5787	0.0468	0.0448	2,457.0937
Mobile	5.2237	24.4026	65.7847	0.2352	18.9195	0.1906	19.1101	5.0632	0.1778	5.2410		23,939.9253	23,939.9253	1.2184		23,970.3843
Total	**21.2075**	**30.6842**	**103.7391**	**0.2745**	**18.9195**	**0.8611**	**19.7806**	**5.0632**	**0.8483**	**5.9115**	**0.0000**	**31,501.1362**	**31,501.1362**	**1.4240**	**0.1375**	**31,577.6970**

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

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	2/16/2019	3/15/2019	5	20	
2	Grading	Grading	3/16/2019	5/17/2019	5	45	
3	Building Construction	Building Construction	5/18/2019	4/16/2021	5	500	
4	Architectural Coating	Architectural Coating	6/22/2020	6/4/2021	5	250	
5	Paving	Paving	4/17/2021	6/4/2021	5	35	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 112.5

Acres of Paving: 9.35

Residential Indoor: 944,460; Residential Outdoor: 314,820; Non-Residential Indoor: 375; Non-Residential Outdoor: 125; Striped Parking Area: 24,936 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Grading	Excavators	2	8.00	158	0.38
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Scrapers	2	8.00	367	0.48
Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Architectural Coating	Air Compressors	1	6.00	78	0.48
Paving	Pavers	2	8.00	130	0.42
Paving	Paving Equipment	2	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation	7	18.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	522.00	136.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	104.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

3.2 Site Preparation - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					18.0663	0.0000	18.0663	9.9307	0.0000	9.9307			0.0000			0.0000
Off-Road	4.3350	45.5727	22.0630	0.0380		2.3904	2.3904		2.1991	2.1991		3,766.452 9	3,766.452 9	1.1917		3,796.244 5
Total	**4.3350**	**45.5727**	**22.0630**	**0.0380**	**18.0663**	**2.3904**	**20.4566**	**9.9307**	**2.1991**	**12.1298**		**3,766.452 9**	**3,766.452 9**	**1.1917**		**3,796.244 5**

3.2 Site Preparation - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	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	0.0719	0.0501	0.6590	1.6200e-003	0.1479	1.3100e-003	0.1492	0.0392	1.2000e-003	0.0404		161.5473	161.5473	5.6300e-003		161.6881
Total	**0.0719**	**0.0501**	**0.6590**	**1.6200e-003**	**0.1479**	**1.3100e-003**	**0.1492**	**0.0392**	**1.2000e-003**	**0.0404**		**161.5473**	**161.5473**	**5.6300e-003**		**161.6881**

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					8.1298	0.0000	8.1298	4.4688	0.0000	4.4688			0.0000			0.0000
Off-Road	4.3350	45.5727	22.0630	0.0380		2.3904	2.3904		2.1991	2.1991	0.0000	3,766.4529	3,766.4529	1.1917		3,796.2445
Total	**4.3350**	**45.5727**	**22.0630**	**0.0380**	**8.1298**	**2.3904**	**10.5202**	**4.4688**	**2.1991**	**6.6679**	**0.0000**	**3,766.4529**	**3,766.4529**	**1.1917**		**3,796.2445**

3.2 Site Preparation - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	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	0.0719	0.0501	0.6590	1.6200e-003	0.1479	1.3100e-003	0.1492	0.0392	1.2000e-003	0.0404		161.5473	161.5473	5.6300e-003		161.6881
Total	**0.0719**	**0.0501**	**0.6590**	**1.6200e-003**	**0.1479**	**1.3100e-003**	**0.1492**	**0.0392**	**1.2000e-003**	**0.0404**		**161.5473**	**161.5473**	**5.6300e-003**		**161.6881**

3.3 Grading - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					8.6733	0.0000	8.6733	3.5965	0.0000	3.5965			0.0000			0.0000
Off-Road	4.7389	54.5202	33.3768	0.0620		2.3827	2.3827		2.1920	2.1920		6,140.0195	6,140.0195	1.9426		6,188.5854
Total	**4.7389**	**54.5202**	**33.3768**	**0.0620**	**8.6733**	**2.3827**	**11.0560**	**3.5965**	**2.1920**	**5.7885**		**6,140.0195**	**6,140.0195**	**1.9426**		**6,188.5854**

3.3 Grading - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	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	0.0799	0.0557	0.7322	1.8000e-003	0.1643	1.4500e-003	0.1658	0.0436	1.3400e-003	0.0449		179.4970	179.4970	6.2600e-003		179.6534
Total	**0.0799**	**0.0557**	**0.7322**	**1.8000e-003**	**0.1643**	**1.4500e-003**	**0.1658**	**0.0436**	**1.3400e-003**	**0.0449**		**179.4970**	**179.4970**	**6.2600e-003**		**179.6534**

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					3.9030	0.0000	3.9030	1.6184	0.0000	1.6184			0.0000			0.0000
Off-Road	4.7389	54.5202	33.3768	0.0620		2.3827	2.3827		2.1920	2.1920	0.0000	6,140.0195	6,140.0195	1.9426		6,188.5854
Total	**4.7389**	**54.5202**	**33.3768**	**0.0620**	**3.9030**	**2.3827**	**6.2857**	**1.6184**	**2.1920**	**3.8105**	**0.0000**	**6,140.0195**	**6,140.0195**	**1.9426**		**6,188.5854**

3.3 Grading - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	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	0.0799	0.0557	0.7322	1.8000e-003	0.1643	1.4500e-003	0.1658	0.0436	1.3400e-003	0.0449		179.4970	179.4970	6.2600e-003		179.6534
Total	**0.0799**	**0.0557**	**0.7322**	**1.8000e-003**	**0.1643**	**1.4500e-003**	**0.1658**	**0.0436**	**1.3400e-003**	**0.0449**		**179.4970**	**179.4970**	**6.2600e-003**		**179.6534**

3.4 Building Construction - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.3612	21.0788	17.1638	0.0269		1.2899	1.2899		1.2127	1.2127		2,591.5802	2,591.5802	0.6313		2,607.3635
Total	**2.3612**	**21.0788**	**17.1638**	**0.0269**		**1.2899**	**1.2899**		**1.2127**	**1.2127**		**2,591.5802**	**2,591.5802**	**0.6313**		**2,607.3635**

3.4 Building Construction - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.5853	16.1632	4.2962	0.0372	0.9209	0.1058	1.0267	0.2651	0.1012	0.3664		3,963.502 1	3,963.502 1	0.2494		3,969.736 7
Worker	2.0855	1.4539	19.1114	0.0471	4.2881	0.0379	4.3260	1.1374	0.0349	1.1723		4,684.871 5	4,684.871 5	0.1633		4,688.953 8
Total	**2.6708**	**17.6171**	**23.4076**	**0.0842**	**5.2090**	**0.1437**	**5.3527**	**1.4025**	**0.1362**	**1.5387**		**8,648.373 6**	**8,648.373 6**	**0.4127**		**8,658.690 5**

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	2.3612	21.0788	17.1638	0.0269		1.2899	1.2899		1.2127	1.2127	0.0000	2,591.580 2	2,591.580 2	0.6313		2,607.363 5
Total	**2.3612**	**21.0788**	**17.1638**	**0.0269**		**1.2899**	**1.2899**		**1.2127**	**1.2127**	**0.0000**	**2,591.580 2**	**2,591.580 2**	**0.6313**		**2,607.363 5**

3.4 Building Construction - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.5853	16.1632	4.2962	0.0372	0.9209	0.1058	1.0267	0.2651	0.1012	0.3664		3,963.502 1	3,963.502 1	0.2494		3,969.736 7
Worker	2.0855	1.4539	19.1114	0.0471	4.2881	0.0379	4.3260	1.1374	0.0349	1.1723		4,684.871 5	4,684.871 5	0.1633		4,688.953 8
Total	**2.6708**	**17.6171**	**23.4076**	**0.0842**	**5.2090**	**0.1437**	**5.3527**	**1.4025**	**0.1362**	**1.5387**		**8,648.373 6**	**8,648.373 6**	**0.4127**		**8,658.690 5**

3.4 Building Construction - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.1198	19.1860	16.8485	0.0269		1.1171	1.1171		1.0503	1.0503		2,553.063 1	2,553.063 1	0.6229		2,568.634 5
Total	**2.1198**	**19.1860**	**16.8485**	**0.0269**		**1.1171**	**1.1171**		**1.0503**	**1.0503**		**2,553.063 1**	**2,553.063 1**	**0.6229**		**2,568.634 5**

3.4 Building Construction - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.5004	14.8320	3.8977	0.0369	0.9209	0.0718	0.9928	0.2651	0.0687	0.3338		3,937.6904	3,937.6904	0.2361		3,943.5934
Worker	1.9197	1.2955	17.3448	0.0456	4.2881	0.0367	4.3249	1.1374	0.0339	1.1713		4,542.6549	4,542.6549	0.1453		4,546.2867
Total	**2.4201**	**16.1275**	**21.2424**	**0.0825**	**5.2091**	**0.1086**	**5.3176**	**1.4025**	**0.1025**	**1.5051**		**8,480.3453**	**8,480.3453**	**0.3814**		**8,489.8801**

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	2.1198	19.1860	16.8485	0.0269		1.1171	1.1171		1.0503	1.0503	0.0000	2,553.0631	2,553.0631	0.6229		2,568.6345
Total	**2.1198**	**19.1860**	**16.8485**	**0.0269**		**1.1171**	**1.1171**		**1.0503**	**1.0503**	**0.0000**	**2,553.0631**	**2,553.0631**	**0.6229**		**2,568.6345**

3.4 Building Construction - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.5004	14.8320	3.8977	0.0369	0.9209	0.0718	0.9928	0.2651	0.0687	0.3338		3,937.6904	3,937.6904	0.2361		3,943.5934
Worker	1.9197	1.2955	17.3448	0.0456	4.2881	0.0367	4.3249	1.1374	0.0339	1.1713		4,542.6549	4,542.6549	0.1453		4,546.2867
Total	**2.4201**	**16.1275**	**21.2424**	**0.0825**	**5.2091**	**0.1086**	**5.3176**	**1.4025**	**0.1025**	**1.5051**		**8,480.3453**	**8,480.3453**	**0.3814**		**8,489.8801**

3.4 Building Construction - 2021

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	1.9009	17.4321	16.5752	0.0269		0.9586	0.9586		0.9013	0.9013		2,553.3639	2,553.3639	0.6160		2,568.7643
Total	**1.9009**	**17.4321**	**16.5752**	**0.0269**		**0.9586**	**0.9586**		**0.9013**	**0.9013**		**2,553.3639**	**2,553.3639**	**0.6160**		**2,568.7643**

3.4 Building Construction - 2021

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	0.4269	13.5116	3.5475	0.0366	0.9210	0.0284	0.9494	0.2651	0.0272	0.2923		3,907.2543	3,907.2543	0.2263		3,912.9113
Worker	1.7860	1.1650	15.9442	0.0442	4.2881	0.0355	4.3236	1.1374	0.0327	1.1701		4,398.4533	4,398.4533	0.1314		4,401.7379
Total	**2.2129**	**14.6766**	**19.4917**	**0.0807**	**5.2091**	**0.0639**	**5.2730**	**1.4026**	**0.0599**	**1.4624**		**8,305.7076**	**8,305.7076**	**0.3577**		**8,314.6492**

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	1.9009	17.4321	16.5752	0.0269		0.9586	0.9586		0.9013	0.9013	0.0000	2,553.3639	2,553.3639	0.6160		2,568.7643
Total	**1.9009**	**17.4321**	**16.5752**	**0.0269**		**0.9586**	**0.9586**		**0.9013**	**0.9013**	**0.0000**	**2,553.3639**	**2,553.3639**	**0.6160**		**2,568.7643**

3.4 Building Construction - 2021

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	0.4269	13.5116	3.5475	0.0366	0.9210	0.0284	0.9494	0.2651	0.0272	0.2923		3,907.2543	3,907.2543	0.2263		3,912.9113
Worker	1.7860	1.1650	15.9442	0.0442	4.2881	0.0355	4.3236	1.1374	0.0327	1.1701		4,398.4533	4,398.4533	0.1314		4,401.7379
Total	**2.2129**	**14.6766**	**19.4917**	**0.0807**	**5.2091**	**0.0639**	**5.2730**	**1.4026**	**0.0599**	**1.4624**		**8,305.7076**	**8,305.7076**	**0.3577**		**8,314.6492**

3.5 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	12.8339					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	**13.0761**	**1.6838**	**1.8314**	**2.9700e-003**		**0.1109**	**0.1109**		**0.1109**	**0.1109**		**281.4481**	**281.4481**	**0.0218**		**281.9928**

3.5 Architectural Coating - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	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	0.3825	0.2581	3.4557	9.0900e-003	0.8543	7.3200e-003	0.8617	0.2266	6.7400e-003	0.2334		905.0500	905.0500	0.0289		905.7736
Total	**0.3825**	**0.2581**	**3.4557**	**9.0900e-003**	**0.8543**	**7.3200e-003**	**0.8617**	**0.2266**	**6.7400e-003**	**0.2334**		**905.0500**	**905.0500**	**0.0289**		**905.7736**

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	12.8339					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	**13.0761**	**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**

3.5 Architectural Coating - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	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	0.3825	0.2581	3.4557	9.0900e-003	0.8543	7.3200e-003	0.8617	0.2266	6.7400e-003	0.2334		905.0500	905.0500	0.0289		905.7736
Total	**0.3825**	**0.2581**	**3.4557**	**9.0900e-003**	**0.8543**	**7.3200e-003**	**0.8617**	**0.2266**	**6.7400e-003**	**0.2334**		**905.0500**	**905.0500**	**0.0289**		**905.7736**

3.5 Architectural Coating - 2021

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	12.8339					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2189	1.5268	1.8176	2.9700e-003		0.0941	0.0941		0.0941	0.0941		281.4481	281.4481	0.0193		281.9309
Total	**13.0528**	**1.5268**	**1.8176**	**2.9700e-003**		**0.0941**	**0.0941**		**0.0941**	**0.0941**		**281.4481**	**281.4481**	**0.0193**		**281.9309**

3.5 Architectural Coating - 2021

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	0.3558	0.2321	3.1766	8.8000e-003	0.8543	7.0800e-003	0.8614	0.2266	6.5200e-003	0.2331		876.3202	876.3202	0.0262		876.9746
Total	**0.3558**	**0.2321**	**3.1766**	**8.8000e-003**	**0.8543**	**7.0800e-003**	**0.8614**	**0.2266**	**6.5200e-003**	**0.2331**		**876.3202**	**876.3202**	**0.0262**		**876.9746**

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	12.8339					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2189	1.5268	1.8176	2.9700e-003		0.0941	0.0941		0.0941	0.0941	0.0000	281.4481	281.4481	0.0193		281.9309
Total	**13.0528**	**1.5268**	**1.8176**	**2.9700e-003**		**0.0941**	**0.0941**		**0.0941**	**0.0941**	**0.0000**	**281.4481**	**281.4481**	**0.0193**		**281.9309**

3.5 Architectural Coating - 2021

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	0.3558	0.2321	3.1766	8.8000e-003	0.8543	7.0800e-003	0.8614	0.2266	6.5200e-003	0.2331		876.3202	876.3202	0.0262		876.9746
Total	**0.3558**	**0.2321**	**3.1766**	**8.8000e-003**	**0.8543**	**7.0800e-003**	**0.8614**	**0.2266**	**6.5200e-003**	**0.2331**		**876.3202**	**876.3202**	**0.0262**		**876.9746**

3.6 Paving - 2021

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	1.2556	12.9191	14.6532	0.0228		0.6777	0.6777		0.6235	0.6235		2,207.2109	2,207.2109	0.7139		2,225.0573
Paving	0.6999					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.9555**	**12.9191**	**14.6532**	**0.0228**		**0.6777**	**0.6777**		**0.6235**	**0.6235**		**2,207.2109**	**2,207.2109**	**0.7139**		**2,225.0573**

3.6 Paving - 2021

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	0.0513	0.0335	0.4582	1.2700e-003	0.1232	1.0200e-003	0.1242	0.0327	9.4000e-004	0.0336		126.3923	126.3923	3.7800e-003		126.4867
Total	**0.0513**	**0.0335**	**0.4582**	**1.2700e-003**	**0.1232**	**1.0200e-003**	**0.1242**	**0.0327**	**9.4000e-004**	**0.0336**		**126.3923**	**126.3923**	**3.7800e-003**		**126.4867**

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	1.2556	12.9191	14.6532	0.0228		0.6777	0.6777		0.6235	0.6235	0.0000	2,207.2109	2,207.2109	0.7139		2,225.0573
Paving	0.6999					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.9555**	**12.9191**	**14.6532**	**0.0228**		**0.6777**	**0.6777**		**0.6235**	**0.6235**	**0.0000**	**2,207.2109**	**2,207.2109**	**0.7139**		**2,225.0573**

3.6 Paving - 2021

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	0.0513	0.0335	0.4582	1.2700e-003	0.1232	1.0200e-003	0.1242	0.0327	9.4000e-004	0.0336		126.3923	126.3923	3.7800e-003		126.4867
Total	**0.0513**	**0.0335**	**0.4582**	**1.2700e-003**	**0.1232**	**1.0200e-003**	**0.1242**	**0.0327**	**9.4000e-004**	**0.0336**		**126.3923**	**126.3923**	**3.7800e-003**		**126.4867**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	5.2237	24.4026	65.7847	0.2352	18.9195	0.1906	19.1101	5.0632	0.1778	5.2410		23,939.9253	23,939.9253	1.2184		23,970.3843
Unmitigated	5.2237	24.4026	65.7847	0.2352	18.9195	0.1906	19.1101	5.0632	0.1778	5.2410		23,939.9253	23,939.9253	1.2184		23,970.3843

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Apartments Low Rise	2,108.80	2,291.20	1942.40	5,995,737	5,995,737
City Park	0.00	0.00	0.00		
Condo/Townhouse	348.60	340.20	290.40	963,044	963,044
Parking Lot	0.00	0.00	0.00		
Recreational Swimming Pool	27.06	7.28	10.88	39,616	39,616
Single Family Housing	456.96	475.68	413.76	1,287,889	1,287,889
Total	2,941.42	3,114.36	2,657.44	8,286,285	8,286,285

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Apartments Low Rise	10.80	7.30	7.50	40.20	19.20	40.60	86	11	3
City Park	9.50	7.30	7.30	33.00	48.00	19.00	66	28	6
Condo/Townhouse	10.80	7.30	7.50	40.20	19.20	40.60	86	11	3
Parking Lot	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0
Recreational Swimming Pool	9.50	7.30	7.30	33.00	48.00	19.00	52	39	9
Single Family Housing	10.80	7.30	7.50	40.20	19.20	40.60	86	11	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Apartments Low Rise	0.546501	0.044961	0.204016	0.120355	0.015740	0.006196	0.020131	0.030678	0.002515	0.002201	0.005142	0.000687	0.000876
City Park	0.546501	0.044961	0.204016	0.120355	0.015740	0.006196	0.020131	0.030678	0.002515	0.002201	0.005142	0.000687	0.000876
Condo/Townhouse	0.546501	0.044961	0.204016	0.120355	0.015740	0.006196	0.020131	0.030678	0.002515	0.002201	0.005142	0.000687	0.000876
Parking Lot	0.546501	0.044961	0.204016	0.120355	0.015740	0.006196	0.020131	0.030678	0.002515	0.002201	0.005142	0.000687	0.000876
Recreational Swimming Pool	0.546501	0.044961	0.204016	0.120355	0.015740	0.006196	0.020131	0.030678	0.002515	0.002201	0.005142	0.000687	0.000876
Single Family Housing	0.546501	0.044961	0.204016	0.120355	0.015740	0.006196	0.020131	0.030678	0.002515	0.002201	0.005142	0.000687	0.000876

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.2239	1.9134	0.8142	0.0122		0.1547	0.1547		0.1547	0.1547		2,442.578 7	2,442.578 7	0.0468	0.0448	2,457.093 7
NaturalGas Unmitigated	0.2239	1.9134	0.8142	0.0122		0.1547	0.1547		0.1547	0.1547		2,442.578 7	2,442.578 7	0.0468	0.0448	2,457.093 7

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					
Apartments Low Rise	14325.3	0.1545	1.3202	0.5618	8.4300e-003		0.1067	0.1067		0.1067	0.1067		1,685.3268	1,685.3268	0.0323	0.0309	1,695.3419
City Park	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Condo/Townhouse	2823.54	0.0305	0.2602	0.1107	1.6600e-003		0.0210	0.0210		0.0210	0.0210		332.1817	332.1817	6.3700e-003	6.0900e-003	334.1557
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Recreational Swimming Pool	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Single Family Housing	3613.1	0.0390	0.3330	0.1417	2.1300e-003		0.0269	0.0269		0.0269	0.0269		425.0702	425.0702	8.1500e-003	7.7900e-003	427.5962
Total		**0.2239**	**1.9134**	**0.8142**	**0.0122**		**0.1547**	**0.1547**		**0.1547**	**0.1547**		**2,442.5787**	**2,442.5787**	**0.0468**	**0.0448**	**2,457.0937**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Apartments Low Rise	14.3253	0.1545	1.3202	0.5618	8.4300e-003		0.1067	0.1067		0.1067	0.1067		1,685.3268	1,685.3268	0.0323	0.0309	1,695.3419
City Park	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Condo/Townhouse	2.82354	0.0305	0.2602	0.1107	1.6600e-003		0.0210	0.0210		0.0210	0.0210		332.1817	332.1817	6.3700e-003	6.0900e-003	334.1557
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Recreational Swimming Pool	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Single Family Housing	3.6131	0.0390	0.3330	0.1417	2.1300e-003		0.0269	0.0269		0.0269	0.0269		425.0702	425.0702	8.1500e-003	7.7900e-003	427.5962
Total		**0.2239**	**1.9134**	**0.8142**	**0.0122**		**0.1547**	**0.1547**		**0.1547**	**0.1547**		**2,442.5787**	**2,442.5787**	**0.0468**	**0.0448**	**2,457.0937**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	15.7599	4.3683	37.1401	0.0272		0.5158	0.5158		0.5158	0.5158	0.0000	5,118.632 2	5,118.632 2	0.1588	0.0927	5,150.219 0
Unmitigated	15.7599	4.3683	37.1401	0.0272		0.5158	0.5158		0.5158	0.5158	0.0000	5,118.632 2	5,118.632 2	0.1588	0.0927	5,150.219 0

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	4.0785					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	10.1404					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	0.4634	3.9596	1.6849	0.0253		0.3201	0.3201		0.3201	0.3201	0.0000	5,054.823 5	5,054.823 5	0.0969	0.0927	5,084.861 8
Landscaping	1.0776	0.4087	35.4552	1.8700e-003		0.1957	0.1957		0.1957	0.1957		63.8087	63.8087	0.0619		65.3572
Total	**15.7599**	**4.3683**	**37.1401**	**0.0271**		**0.5158**	**0.5158**		**0.5158**	**0.5158**	**0.0000**	**5,118.632 2**	**5,118.632 2**	**0.1588**	**0.0927**	**5,150.219 0**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	4.0785					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	10.1404					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	0.4634	3.9596	1.6849	0.0253		0.3201	0.3201		0.3201	0.3201	0.0000	5,054.8235	5,054.8235	0.0969	0.0927	5,084.8618
Landscaping	1.0776	0.4087	35.4552	1.8700e-003		0.1957	0.1957		0.1957	0.1957		63.8087	63.8087	0.0619		65.3572
Total	**15.7599**	**4.3683**	**37.1401**	**0.0271**		**0.5158**	**0.5158**		**0.5158**	**0.5158**	**0.0000**	**5,118.6322**	**5,118.6322**	**0.1588**	**0.0927**	**5,150.2190**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

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

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

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

Boilers

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

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

20th and Rancho

Los Angeles-Mojave Desert County, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Parking Lot	1,039.00	Space	9.35	415,600.00	0
City Park	3.06	Acre	3.06	133,345.00	0
Recreational Swimming Pool	0.80	1000sqft	0.02	800.00	0
Apartments Low Rise	320.00	Dwelling Unit	13.70	320,000.00	915
Condo/Townhouse	60.00	Dwelling Unit	2.90	60,000.00	172
Single Family Housing	48.00	Dwelling Unit	3.03	86,400.00	137

1.2 Other Project Characteristics

Urbanization Urban **Wind Speed (m/s)** 2.2 **Precipitation Freq (Days)** 33

Climate Zone 9 **Operational Year** 2022

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 - Source: site plan, acreage included in residential component; assumed club house was 250 sf and swimming pool was 20x40

Construction Phase - Architectural coating phase updated to reflect more accurate construction schedule

Architectural Coating - CalGreen and AVAQMD Rule 1113

Vehicle Trips - City park land use used as proxy for usable open space

Woodstoves - No woodburning fireplaces or stoves onsite per client

Construction Off-road Equipment Mitigation -

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	EF_Nonresidential_Exterior	250.00	50.00
tblArchitecturalCoating	EF_Nonresidential_Interior	250.00	50.00
tblArchitecturalCoating	EF_Residential_Exterior	250.00	50.00
tblArchitecturalCoating	EF_Residential_Interior	250.00	50.00
tblConstructionPhase	NumDays	35.00	250.00
tblFireplaces	FireplaceWoodMass	3,078.40	0.00
tblFireplaces	FireplaceWoodMass	3,078.40	0.00
tblFireplaces	FireplaceWoodMass	3,078.40	0.00
tblFireplaces	NumberGas	33.00	36.30
tblFireplaces	NumberNoFireplace	6.00	6.60
tblFireplaces	NumberWood	112.00	0.00
tblFireplaces	NumberWood	21.00	0.00
tblFireplaces	NumberWood	16.80	0.00
tblLandUse	LandUseSquareFeet	133,293.60	133,345.00
tblLandUse	LotAcreage	20.00	13.70
tblLandUse	LotAcreage	3.75	2.90
tblLandUse	LotAcreage	15.58	3.03
tblVehicleTrips	ST_TR	22.75	0.00

tblVehicleTrips	SU_TR	16.74	0.00
tblVehicleTrips	WD_TR	1.89	0.00
tblWoodstoves	NumberCatalytic	16.00	0.00
tblWoodstoves	NumberCatalytic	3.00	0.00
tblWoodstoves	NumberCatalytic	2.40	0.00
tblWoodstoves	NumberNoncatalytic	16.00	0.00
tblWoodstoves	NumberNoncatalytic	3.00	0.00
tblWoodstoves	NumberNoncatalytic	2.40	0.00
tblWoodstoves	WoodstoveDayYear	82.00	0.00
tblWoodstoves	WoodstoveDayYear	82.00	0.00
tblWoodstoves	WoodstoveDayYear	82.00	0.00
tblWoodstoves	WoodstoveWoodMass	3,019.20	0.00
tblWoodstoves	WoodstoveWoodMass	3,019.20	0.00
tblWoodstoves	WoodstoveWoodMass	3,019.20	0.00

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2019	5.2524	54.5819	39.5939	0.1075	18.2141	2.3917	20.6058	9.9699	2.2003	12.1702	0.0000	10,865.1710	10,865.1710	1.9486	0.0000	10,891.4596
2020	18.2404	37.4332	42.1995	0.1173	6.0634	1.3449	7.4083	1.6292	1.2716	2.9007	0.0000	11,800.1777	11,800.1777	1.0606	0.0000	11,826.6923
2021	17.7511	34.0017	39.9523	0.1154	6.0634	1.1246	7.1880	1.6292	1.0626	2.6918	0.0000	11,607.6838	11,607.6838	1.0249	0.0000	11,633.3054
Maximum	**18.2404**	**54.5819**	**42.1995**	**0.1173**	**18.2141**	**2.3917**	**20.6058**	**9.9699**	**2.2003**	**12.1702**	**0.0000**	**11,800.1777**	**11,800.1777**	**1.9486**	**0.0000**	**11,826.6923**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2019	5.2524	54.5819	39.5939	0.1075	8.2777	2.3917	10.6694	4.5080	2.2003	6.7084	0.0000	10,865.1710	10,865.1710	1.9486	0.0000	10,891.4596
2020	18.2404	37.4332	42.1995	0.1173	6.0634	1.3449	7.4083	1.6292	1.2716	2.9007	0.0000	11,800.1777	11,800.1777	1.0606	0.0000	11,826.6923
2021	17.7511	34.0017	39.9523	0.1154	6.0634	1.1246	7.1880	1.6292	1.0626	2.6918	0.0000	11,607.6838	11,607.6838	1.0249	0.0000	11,633.3054
Maximum	**18.2404**	**54.5819**	**42.1995**	**0.1173**	**8.2777**	**2.3917**	**10.6694**	**4.5080**	**2.2003**	**6.7084**	**0.0000**	**11,800.1777**	**11,800.1777**	**1.9486**	**0.0000**	**11,826.6923**

	ROG	NOx	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	32.75	0.00	28.23	41.29	0.00	30.75	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	15.7599	4.3683	37.1401	0.0272		0.5158	0.5158		0.5158	0.5158	0.0000	5,118.6322	5,118.6322	0.1588	0.0927	5,150.2190
Energy	0.2239	1.9134	0.8142	0.0122		0.1547	0.1547		0.1547	0.1547		2,442.5787	2,442.5787	0.0468	0.0448	2,457.0937
Mobile	5.0680	24.9096	62.8016	0.2236	18.9195	0.1917	19.1112	5.0632	0.1788	5.2420		22,776.2604	22,776.2604	1.2188		22,806.7307
Total	**21.0518**	**31.1912**	**100.7559**	**0.2630**	**18.9195**	**0.8622**	**19.7817**	**5.0632**	**0.8494**	**5.9125**	**0.0000**	**30,337.4713**	**30,337.4713**	**1.4245**	**0.1375**	**30,414.0434**

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	15.7599	4.3683	37.1401	0.0272		0.5158	0.5158		0.5158	0.5158	0.0000	5,118.6322	5,118.6322	0.1588	0.0927	5,150.2190
Energy	0.2239	1.9134	0.8142	0.0122		0.1547	0.1547		0.1547	0.1547		2,442.5787	2,442.5787	0.0468	0.0448	2,457.0937
Mobile	5.0680	24.9096	62.8016	0.2236	18.9195	0.1917	19.1112	5.0632	0.1788	5.2420		22,776.2604	22,776.2604	1.2188		22,806.7307
Total	**21.0518**	**31.1912**	**100.7559**	**0.2630**	**18.9195**	**0.8622**	**19.7817**	**5.0632**	**0.8494**	**5.9125**	**0.0000**	**30,337.4713**	**30,337.4713**	**1.4245**	**0.1375**	**30,414.0434**

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

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	2/16/2019	3/15/2019	5	20	
2	Grading	Grading	3/16/2019	5/17/2019	5	45	
3	Building Construction	Building Construction	5/18/2019	4/16/2021	5	500	
4	Architectural Coating	Architectural Coating	6/22/2020	6/4/2021	5	250	
5	Paving	Paving	4/17/2021	6/4/2021	5	35	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 112.5

Acres of Paving: 9.35

Residential Indoor: 944,460; Residential Outdoor: 314,820; Non-Residential Indoor: 375; Non-Residential Outdoor: 125; Striped Parking Area: 24,936 (Architectural Coating – sqft)

OffRoad Equipment

20th and Rancho - Los Angeles-Mojave Desert County, Winter

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Grading	Excavators	2	8.00	158	0.38
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Scrapers	2	8.00	367	0.48
Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Architectural Coating	Air Compressors	1	6.00	78	0.48
Paving	Pavers	2	8.00	130	0.42
Paving	Paving Equipment	2	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation	7	18.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	522.00	136.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	104.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

3.2 Site Preparation - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					18.0663	0.0000	18.0663	9.9307	0.0000	9.9307			0.0000			0.0000
Off-Road	4.3350	45.5727	22.0630	0.0380		2.3904	2.3904		2.1991	2.1991		3,766.452 9	3,766.452 9	1.1917		3,796.244 5
Total	**4.3350**	**45.5727**	**22.0630**	**0.0380**	**18.0663**	**2.3904**	**20.4566**	**9.9307**	**2.1991**	**12.1298**		**3,766.452 9**	**3,766.452 9**	**1.1917**		**3,796.244 5**

3.2 Site Preparation - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	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	0.0787	0.0555	0.6106	1.5300e-003	0.1479	1.3100e-003	0.1492	0.0392	1.2000e-003	0.0404		152.1586	152.1586	5.3300e-003		152.2919
Total	**0.0787**	**0.0555**	**0.6106**	**1.5300e-003**	**0.1479**	**1.3100e-003**	**0.1492**	**0.0392**	**1.2000e-003**	**0.0404**		**152.1586**	**152.1586**	**5.3300e-003**		**152.2919**

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					8.1298	0.0000	8.1298	4.4688	0.0000	4.4688			0.0000			0.0000
Off-Road	4.3350	45.5727	22.0630	0.0380		2.3904	2.3904		2.1991	2.1991	0.0000	3,766.4529	3,766.4529	1.1917		3,796.2445
Total	**4.3350**	**45.5727**	**22.0630**	**0.0380**	**8.1298**	**2.3904**	**10.5202**	**4.4688**	**2.1991**	**6.6679**	**0.0000**	**3,766.4529**	**3,766.4529**	**1.1917**		**3,796.2445**

3.2 Site Preparation - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	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	0.0787	0.0555	0.6106	1.5300e-003	0.1479	1.3100e-003	0.1492	0.0392	1.2000e-003	0.0404		152.1586	152.1586	5.3300e-003		152.2919
Total	**0.0787**	**0.0555**	**0.6106**	**1.5300e-003**	**0.1479**	**1.3100e-003**	**0.1492**	**0.0392**	**1.2000e-003**	**0.0404**		**152.1586**	**152.1586**	**5.3300e-003**		**152.2919**

3.3 Grading - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					8.6733	0.0000	8.6733	3.5965	0.0000	3.5965			0.0000			0.0000
Off-Road	4.7389	54.5202	33.3768	0.0620		2.3827	2.3827		2.1920	2.1920		6,140.0195	6,140.0195	1.9426		6,188.5854
Total	**4.7389**	**54.5202**	**33.3768**	**0.0620**	**8.6733**	**2.3827**	**11.0560**	**3.5965**	**2.1920**	**5.7885**		**6,140.0195**	**6,140.0195**	**1.9426**		**6,188.5854**

3.3 Grading - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	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	0.0874	0.0617	0.6785	1.7000e-003	0.1643	1.4500e-003	0.1658	0.0436	1.3400e-003	0.0449		169.0651	169.0651	5.9300e-003		169.2132
Total	**0.0874**	**0.0617**	**0.6785**	**1.7000e-003**	**0.1643**	**1.4500e-003**	**0.1658**	**0.0436**	**1.3400e-003**	**0.0449**		**169.0651**	**169.0651**	**5.9300e-003**		**169.2132**

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					3.9030	0.0000	3.9030	1.6184	0.0000	1.6184			0.0000			0.0000
Off-Road	4.7389	54.5202	33.3768	0.0620		2.3827	2.3827		2.1920	2.1920	0.0000	6,140.0195	6,140.0195	1.9426		6,188.5854
Total	**4.7389**	**54.5202**	**33.3768**	**0.0620**	**3.9030**	**2.3827**	**6.2857**	**1.6184**	**2.1920**	**3.8105**	**0.0000**	**6,140.0195**	**6,140.0195**	**1.9426**		**6,188.5854**

3.3 Grading - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	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	0.0874	0.0617	0.6785	1.7000e-003	0.1643	1.4500e-003	0.1658	0.0436	1.3400e-003	0.0449		169.0651	169.0651	5.9300e-003		169.2132
Total	**0.0874**	**0.0617**	**0.6785**	**1.7000e-003**	**0.1643**	**1.4500e-003**	**0.1658**	**0.0436**	**1.3400e-003**	**0.0449**		**169.0651**	**169.0651**	**5.9300e-003**		**169.2132**

3.4 Building Construction - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.3612	21.0788	17.1638	0.0269		1.2899	1.2899		1.2127	1.2127		2,591.5802	2,591.5802	0.6313		2,607.3635
Total	**2.3612**	**21.0788**	**17.1638**	**0.0269**		**1.2899**	**1.2899**		**1.2127**	**1.2127**		**2,591.5802**	**2,591.5802**	**0.6313**		**2,607.3635**

3.4 Building Construction - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.6097	16.2012	4.7221	0.0362	0.9209	0.1075	1.0284	0.2651	0.1028	0.3679		3,860.992 0	3,860.992 0	0.2656		3,867.630 7
Worker	2.2815	1.6096	17.7080	0.0443	4.2881	0.0379	4.3260	1.1374	0.0349	1.1723		4,412.598 9	4,412.598 9	0.1547		4,416.465 4
Total	**2.8912**	**17.8108**	**22.4301**	**0.0806**	**5.2090**	**0.1454**	**5.3544**	**1.4025**	**0.1377**	**1.5403**		**8,273.590 9**	**8,273.590 9**	**0.4202**		**8,284.096 1**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.3612	21.0788	17.1638	0.0269		1.2899	1.2899		1.2127	1.2127	0.0000	2,591.580 2	2,591.580 2	0.6313		2,607.363 5
Total	**2.3612**	**21.0788**	**17.1638**	**0.0269**		**1.2899**	**1.2899**		**1.2127**	**1.2127**	**0.0000**	**2,591.580 2**	**2,591.580 2**	**0.6313**		**2,607.363 5**

3.4 Building Construction - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.6097	16.2012	4.7221	0.0362	0.9209	0.1075	1.0284	0.2651	0.1028	0.3679		3,860.992 0	3,860.992 0	0.2656		3,867.630 7
Worker	2.2815	1.6096	17.7080	0.0443	4.2881	0.0379	4.3260	1.1374	0.0349	1.1723		4,412.598 9	4,412.598 9	0.1547		4,416.465 4
Total	**2.8912**	**17.8108**	**22.4301**	**0.0806**	**5.2090**	**0.1454**	**5.3544**	**1.4025**	**0.1377**	**1.5403**		**8,273.590 9**	**8,273.590 9**	**0.4202**		**8,284.096 1**

3.4 Building Construction - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.1198	19.1860	16.8485	0.0269		1.1171	1.1171		1.0503	1.0503		2,553.063 1	2,553.063 1	0.6229		2,568.634 5
Total	**2.1198**	**19.1860**	**16.8485**	**0.0269**		**1.1171**	**1.1171**		**1.0503**	**1.0503**		**2,553.063 1**	**2,553.063 1**	**0.6229**		**2,568.634 5**

3.4 Building Construction - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.5225	14.8436	4.2867	0.0359	0.9209	0.0729	0.9938	0.2651	0.0697	0.3349		3,834.6618	3,834.6618	0.2512		3,840.9429
Worker	2.1029	1.4340	16.0377	0.0430	4.2881	0.0367	4.3249	1.1374	0.0339	1.1713		4,278.5695	4,278.5695	0.1373		4,282.0028
Total	**2.6255**	**16.2776**	**20.3244**	**0.0789**	**5.2091**	**0.1096**	**5.3187**	**1.4025**	**0.1036**	**1.5061**		**8,113.2313**	**8,113.2313**	**0.3886**		**8,122.9456**

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	2.1198	19.1860	16.8485	0.0269		1.1171	1.1171		1.0503	1.0503	0.0000	2,553.0631	2,553.0631	0.6229		2,568.6345
Total	**2.1198**	**19.1860**	**16.8485**	**0.0269**		**1.1171**	**1.1171**		**1.0503**	**1.0503**	**0.0000**	**2,553.0631**	**2,553.0631**	**0.6229**		**2,568.6345**

3.4 Building Construction - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.5225	14.8436	4.2867	0.0359	0.9209	0.0729	0.9938	0.2651	0.0697	0.3349		3,834.661 8	3,834.661 8	0.2512		3,840.942 9
Worker	2.1029	1.4340	16.0377	0.0430	4.2881	0.0367	4.3249	1.1374	0.0339	1.1713		4,278.569 5	4,278.569 5	0.1373		4,282.002 8
Total	**2.6255**	**16.2776**	**20.3244**	**0.0789**	**5.2091**	**0.1096**	**5.3187**	**1.4025**	**0.1036**	**1.5061**		**8,113.231 3**	**8,113.231 3**	**0.3886**		**8,122.945 6**

3.4 Building Construction - 2021

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	1.9009	17.4321	16.5752	0.0269		0.9586	0.9586		0.9013	0.9013		2,553.363 9	2,553.363 9	0.6160		2,568.764 3
Total	**1.9009**	**17.4321**	**16.5752**	**0.0269**		**0.9586**	**0.9586**		**0.9013**	**0.9013**		**2,553.363 9**	**2,553.363 9**	**0.6160**		**2,568.764 3**

3.4 Building Construction - 2021

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	0.4476	13.4966	3.9131	0.0356	0.9210	0.0293	0.9502	0.2651	0.0280	0.2931		3,804.776 9	3,804.776 9	0.2408		3,810.795 7
Worker	1.9594	1.2893	14.7148	0.0416	4.2881	0.0355	4.3236	1.1374	0.0327	1.1701		4,142.724 6	4,142.724 6	0.1241		4,145.826 1
Total	**2.4070**	**14.7859**	**18.6279**	**0.0772**	**5.2091**	**0.0648**	**5.2739**	**1.4026**	**0.0607**	**1.4633**		**7,947.501 5**	**7,947.501 5**	**0.3648**		**7,956.621 9**

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	1.9009	17.4321	16.5752	0.0269		0.9586	0.9586		0.9013	0.9013	0.0000	2,553.363 9	2,553.363 9	0.6160		2,568.764 3
Total	**1.9009**	**17.4321**	**16.5752**	**0.0269**		**0.9586**	**0.9586**		**0.9013**	**0.9013**	**0.0000**	**2,553.363 9**	**2,553.363 9**	**0.6160**		**2,568.764 3**

3.4 Building Construction - 2021

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	0.4476	13.4966	3.9131	0.0356	0.9210	0.0293	0.9502	0.2651	0.0280	0.2931		3,804.776 9	3,804.776 9	0.2408		3,810.795 7
Worker	1.9594	1.2893	14.7148	0.0416	4.2881	0.0355	4.3236	1.1374	0.0327	1.1701		4,142.724 6	4,142.724 6	0.1241		4,145.826 1
Total	**2.4070**	**14.7859**	**18.6279**	**0.0772**	**5.2091**	**0.0648**	**5.2739**	**1.4026**	**0.0607**	**1.4633**		**7,947.501 5**	**7,947.501 5**	**0.3648**		**7,956.621 9**

3.5 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	12.8339					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	**13.0761**	**1.6838**	**1.8314**	**2.9700e-003**		**0.1109**	**0.1109**		**0.1109**	**0.1109**		**281.4481**	**281.4481**	**0.0218**		**281.9928**

3.5 Architectural Coating - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	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	0.4190	0.2857	3.1953	8.5600e-003	0.8543	7.3200e-003	0.8617	0.2266	6.7400e-003	0.2334		852.4353	852.4353	0.0274		853.1193
Total	**0.4190**	**0.2857**	**3.1953**	**8.5600e-003**	**0.8543**	**7.3200e-003**	**0.8617**	**0.2266**	**6.7400e-003**	**0.2334**		**852.4353**	**852.4353**	**0.0274**		**853.1193**

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	12.8339					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	**13.0761**	**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**

3.5 Architectural Coating - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	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	0.4190	0.2857	3.1953	8.5600e-003	0.8543	7.3200e-003	0.8617	0.2266	6.7400e-003	0.2334		852.4353	852.4353	0.0274		853.1193
Total	**0.4190**	**0.2857**	**3.1953**	**8.5600e-003**	**0.8543**	**7.3200e-003**	**0.8617**	**0.2266**	**6.7400e-003**	**0.2334**		**852.4353**	**852.4353**	**0.0274**		**853.1193**

3.5 Architectural Coating - 2021

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	12.8339					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2189	1.5268	1.8176	2.9700e-003		0.0941	0.0941		0.0941	0.0941		281.4481	281.4481	0.0193		281.9309
Total	**13.0528**	**1.5268**	**1.8176**	**2.9700e-003**		**0.0941**	**0.0941**		**0.0941**	**0.0941**		**281.4481**	**281.4481**	**0.0193**		**281.9309**

3.5 Architectural Coating - 2021

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	0.3904	0.2569	2.9317	8.2900e-003	0.8543	7.0800e-003	0.8614	0.2266	6.5200e-003	0.2331		825.3704	825.3704	0.0247		825.9883
Total	**0.3904**	**0.2569**	**2.9317**	**8.2900e-003**	**0.8543**	**7.0800e-003**	**0.8614**	**0.2266**	**6.5200e-003**	**0.2331**		**825.3704**	**825.3704**	**0.0247**		**825.9883**

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	12.8339					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2189	1.5268	1.8176	2.9700e-003		0.0941	0.0941		0.0941	0.0941	0.0000	281.4481	281.4481	0.0193		281.9309
Total	**13.0528**	**1.5268**	**1.8176**	**2.9700e-003**		**0.0941**	**0.0941**		**0.0941**	**0.0941**	**0.0000**	**281.4481**	**281.4481**	**0.0193**		**281.9309**

3.5 Architectural Coating - 2021

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	0.3904	0.2569	2.9317	8.2900e-003	0.8543	7.0800e-003	0.8614	0.2266	6.5200e-003	0.2331		825.3704	825.3704	0.0247		825.9883
Total	**0.3904**	**0.2569**	**2.9317**	**8.2900e-003**	**0.8543**	**7.0800e-003**	**0.8614**	**0.2266**	**6.5200e-003**	**0.2331**		**825.3704**	**825.3704**	**0.0247**		**825.9883**

3.6 Paving - 2021

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	1.2556	12.9191	14.6532	0.0228		0.6777	0.6777		0.6235	0.6235		2,207.2109	2,207.2109	0.7139		2,225.0573
Paving	0.6999					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.9555**	**12.9191**	**14.6532**	**0.0228**		**0.6777**	**0.6777**		**0.6235**	**0.6235**		**2,207.2109**	**2,207.2109**	**0.7139**		**2,225.0573**

3.6 Paving - 2021

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	0.0563	0.0371	0.4228	1.2000e-003	0.1232	1.0200e-003	0.1242	0.0327	9.4000e-004	0.0336		119.0438	119.0438	3.5600e-003		119.1329
Total	**0.0563**	**0.0371**	**0.4228**	**1.2000e-003**	**0.1232**	**1.0200e-003**	**0.1242**	**0.0327**	**9.4000e-004**	**0.0336**		**119.0438**	**119.0438**	**3.5600e-003**		**119.1329**

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	1.2556	12.9191	14.6532	0.0228		0.6777	0.6777		0.6235	0.6235	0.0000	2,207.2109	2,207.2109	0.7139		2,225.0573
Paving	0.6999					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.9555**	**12.9191**	**14.6532**	**0.0228**		**0.6777**	**0.6777**		**0.6235**	**0.6235**	**0.0000**	**2,207.2109**	**2,207.2109**	**0.7139**		**2,225.0573**

3.6 Paving - 2021

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	0.0563	0.0371	0.4228	1.2000e-003	0.1232	1.0200e-003	0.1242	0.0327	9.4000e-004	0.0336		119.0438	119.0438	3.5600e-003		119.1329
Total	**0.0563**	**0.0371**	**0.4228**	**1.2000e-003**	**0.1232**	**1.0200e-003**	**0.1242**	**0.0327**	**9.4000e-004**	**0.0336**		**119.0438**	**119.0438**	**3.5600e-003**		**119.1329**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	5.0680	24.9096	62.8016	0.2236	18.9195	0.1917	19.1112	5.0632	0.1788	5.2420		22,776.2604	22,776.2604	1.2188		22,806.7307
Unmitigated	5.0680	24.9096	62.8016	0.2236	18.9195	0.1917	19.1112	5.0632	0.1788	5.2420		22,776.2604	22,776.2604	1.2188		22,806.7307

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Apartments Low Rise	2,108.80	2,291.20	1942.40	5,995,737	5,995,737
City Park	0.00	0.00	0.00		
Condo/Townhouse	348.60	340.20	290.40	963,044	963,044
Parking Lot	0.00	0.00	0.00		
Recreational Swimming Pool	27.06	7.28	10.88	39,616	39,616
Single Family Housing	456.96	475.68	413.76	1,287,889	1,287,889
Total	2,941.42	3,114.36	2,657.44	8,286,285	8,286,285

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Apartments Low Rise	10.80	7.30	7.50	40.20	19.20	40.60	86	11	3
City Park	9.50	7.30	7.30	33.00	48.00	19.00	66	28	6
Condo/Townhouse	10.80	7.30	7.50	40.20	19.20	40.60	86	11	3
Parking Lot	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0
Recreational Swimming Pool	9.50	7.30	7.30	33.00	48.00	19.00	52	39	9
Single Family Housing	10.80	7.30	7.50	40.20	19.20	40.60	86	11	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Apartments Low Rise	0.546501	0.044961	0.204016	0.120355	0.015740	0.006196	0.020131	0.030678	0.002515	0.002201	0.005142	0.000687	0.000876
City Park	0.546501	0.044961	0.204016	0.120355	0.015740	0.006196	0.020131	0.030678	0.002515	0.002201	0.005142	0.000687	0.000876
Condo/Townhouse	0.546501	0.044961	0.204016	0.120355	0.015740	0.006196	0.020131	0.030678	0.002515	0.002201	0.005142	0.000687	0.000876
Parking Lot	0.546501	0.044961	0.204016	0.120355	0.015740	0.006196	0.020131	0.030678	0.002515	0.002201	0.005142	0.000687	0.000876
Recreational Swimming Pool	0.546501	0.044961	0.204016	0.120355	0.015740	0.006196	0.020131	0.030678	0.002515	0.002201	0.005142	0.000687	0.000876
Single Family Housing	0.546501	0.044961	0.204016	0.120355	0.015740	0.006196	0.020131	0.030678	0.002515	0.002201	0.005142	0.000687	0.000876

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.2239	1.9134	0.8142	0.0122		0.1547	0.1547		0.1547	0.1547		2,442.5787	2,442.5787	0.0468	0.0448	2,457.0937
NaturalGas Unmitigated	0.2239	1.9134	0.8142	0.0122		0.1547	0.1547		0.1547	0.1547		2,442.5787	2,442.5787	0.0468	0.0448	2,457.0937

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					
Apartments Low Rise	14325.3	0.1545	1.3202	0.5618	8.4300e-003		0.1067	0.1067		0.1067	0.1067		1,685.3268	1,685.3268	0.0323	0.0309	1,695.3419
City Park	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Condo/Townhouse	2823.54	0.0305	0.2602	0.1107	1.6600e-003		0.0210	0.0210		0.0210	0.0210		332.1817	332.1817	6.3700e-003	6.0900e-003	334.1557
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Recreational Swimming Pool	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Single Family Housing	3613.1	0.0390	0.3330	0.1417	2.1300e-003		0.0269	0.0269		0.0269	0.0269		425.0702	425.0702	8.1500e-003	7.7900e-003	427.5962
Total		**0.2239**	**1.9134**	**0.8142**	**0.0122**		**0.1547**	**0.1547**		**0.1547**	**0.1547**		**2,442.5787**	**2,442.5787**	**0.0468**	**0.0448**	**2,457.0937**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Apartments Low Rise	14.3253	0.1545	1.3202	0.5618	8.4300e-003		0.1067	0.1067		0.1067	0.1067		1,685.3268	1,685.3268	0.0323	0.0309	1,695.3419
City Park	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Condo/Townhouse	2.82354	0.0305	0.2602	0.1107	1.6600e-003		0.0210	0.0210		0.0210	0.0210		332.1817	332.1817	6.3700e-003	6.0900e-003	334.1557
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Recreational Swimming Pool	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Single Family Housing	3.6131	0.0390	0.3330	0.1417	2.1300e-003		0.0269	0.0269		0.0269	0.0269		425.0702	425.0702	8.1500e-003	7.7900e-003	427.5962
Total		**0.2239**	**1.9134**	**0.8142**	**0.0122**		**0.1547**	**0.1547**		**0.1547**	**0.1547**		**2,442.5787**	**2,442.5787**	**0.0468**	**0.0448**	**2,457.0937**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	15.7599	4.3683	37.1401	0.0272		0.5158	0.5158		0.5158	0.5158	0.0000	5,118.6322	5,118.6322	0.1588	0.0927	5,150.2190
Unmitigated	15.7599	4.3683	37.1401	0.0272		0.5158	0.5158		0.5158	0.5158	0.0000	5,118.6322	5,118.6322	0.1588	0.0927	5,150.2190

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	4.0785					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	10.1404					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	0.4634	3.9596	1.6849	0.0253		0.3201	0.3201		0.3201	0.3201	0.0000	5,054.8235	5,054.8235	0.0969	0.0927	5,084.8618
Landscaping	1.0776	0.4087	35.4552	1.8700e-003		0.1957	0.1957		0.1957	0.1957		63.8087	63.8087	0.0619		65.3572
Total	**15.7599**	**4.3683**	**37.1401**	**0.0271**		**0.5158**	**0.5158**		**0.5158**	**0.5158**	**0.0000**	**5,118.6322**	**5,118.6322**	**0.1588**	**0.0927**	**5,150.2190**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	4.0785					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	10.1404					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	0.4634	3.9596	1.6849	0.0253		0.3201	0.3201		0.3201	0.3201	0.0000	5,054.8235	5,054.8235	0.0969	0.0927	5,084.8618
Landscaping	1.0776	0.4087	35.4552	1.8700e-003		0.1957	0.1957		0.1957	0.1957		63.8087	63.8087	0.0619		65.3572
Total	**15.7599**	**4.3683**	**37.1401**	**0.0271**		**0.5158**	**0.5158**		**0.5158**	**0.5158**	**0.0000**	**5,118.6322**	**5,118.6322**	**0.1588**	**0.0927**	**5,150.2190**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

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

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

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

Boilers

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

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

APPENDIX: B

Biological Resource Assessment
and
Native Vegetation Preservation Plan
for
Residential Development

Palmdale, California

Amended Mar 21, 2018
October 31, 2017

Mark Hagan, Wildlife Biologist
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B.S. Degree, Wildlife Management
Humboldt State University

Biological Resource Assessment and Native Vegetation Preservation Plan for Residential Development, Palmdale, California

Mark Hagan, Wildlife Biologist, 44715 17th Street East, Lancaster, CA 93535

Abstract

Residential development has been proposed for APNs 3005-005-014, 023, 024, 025. The approximately 35 acre (14 ha) study area was located north of Rancho Vista Boulevard and east of 20th Street West, T6N, R12W, the SW1/4 of the SW1/4 of Section 16, S.B.B.M. A line transect survey was conducted on 22 and 23 October 2017 to inventory biological resources. This study was also conducted to provide an estimated density and distribution of Joshua trees (*Yucca brevifolia*) and California juniper trees (*Juniperus californica*) occurring within the proposed project area. The proposed project area was characteristic of a Joshua tree and California juniper ecotone. A total of forty-three plant species and thirty-eight wildlife species or their sign were observed during the line transect survey**.** A total of 67 Joshua trees and approximately 236 California juniper trees were counted during the line transect survey. A total of 38 Joshua trees appeared suitable for transplanting. No desert tortoises (*Gopherus agassizii*) or their sign were observed during the field survey. No burrowing owls (*Athene cunicularia*) or their sign were observed during the field surveys. California ground squirrel (*Citellus beecheyi*) burrows were observed within the study site. California ground squirrel burrows provide future potential cover sites for burrowing owls. The vegetation within the study site provides potential nesting sites for migratory birds. The proposed project area was not located within the geographic range of the Mohave ground squirrel (*Spermophilus mohavensis*). The study area did not appear suitable to support Mohave ground squirrels. Mohave ground squirrels are not expected to be present within the study area. No mitigation for this species is recommended. No other state or federally listed species are expected to occur within the proposed project area. No blue line streams were documented on the USGS Quadrangle for the study area. No ephemeral washes were observed within the study area.

Recommended Mitigation Measures

A burrowing owl survey will be accomplished within 30 days prior to construction activities to ensure burrowing owls are not present during construction activities. If burrowing owls are discovered the guidance outlined in the CDFW 2012 “Staff Report on Burrowing Owl Mitigation” will be used for addressing burrowing owl issues on the study site (California Department of Fish and Game 2012).

The vegetation within the study area offers potential nesting habitat for migratory birds. If possible, removal of vegetation should occur outside the breeding season for migratory birds. Nesting generally lasts from February to July but may extend beyond this time frame. If vegetation removal will occur during or close to the nesting season, a qualified biologist will survey all areas to be disturbed as close as possible but no more than one week prior to removal. If active bird nests are found, impacts to nests will be avoided by either delaying work or establishing initial buffer areas of a minimum of 500 feet (161 m) for active nesting raptors and 50 feet (16 m) around other active migratory bird species nests. The project biologist will determine if the buffer areas should be increased or decreased based on the nesting bird response to disturbances.

Significance: This project is not expected to result in a significant adverse impact to biological resources.

Residential development has been proposed for APNs 3005-005-014, 023, 024, 025, Palmdale, California (Figure 1). Development would include installation of access roads, utilities (water, sewer, electric, etc.), parking areas, etc. The entire project area would be graded prior to construction activities.

An environmental analysis should be conducted prior to any development project. An assessment of biological resources is an integral part of environmental analyses (Gilbert and Dodds 1987). The purpose of this study was to provide an assessment of biological resources potentially occurring within, or utilizing the proposed project area. Specific focus was on the presence/absence of rare, threatened and endangered species of plants and wildlife. This study was also conducted to provide an estimated density and distribution of Joshua trees (*Yucca brevifolia*) and California juniper trees (*Juniperus californica*) occurring within the proposed project area.

Study Area

The approximately 40 acre (16 ha) study area was located north of Rancho Vista Boulevard and east of 20th Street West, T6N, R12W, the SW1/4 of the SW1/4 of Section 16, S.B.B.M. (Figure 2 and 3). A chain link fence and a private road formed the northern boundary of the study area. A block wall formed the eastern boundary of the study area. Single-family homes existed along the eastern and northern boundaries of the study area. Rancho Vista Boulevard (Avenue P) formed the southern boundary of the study area. The western boundary of the study area was formed by 20th Street West. Single-family homes existed south of Rancho Vista Boulevard. Topography of the study area was approximately 2,700 to 2,710 feet (871 to 874 m) above sea level.

Methods

A line transect survey was conducted to inventory plant and wildlife species occurring within the proposed project area (Cooperrider et al. 1986, Davis 1990). Line transects were walked in a north-south orientation. Line transects ranged from 660 to 1,320 feet (213 to 426 m) long and spaced about 35 feet (11 m) apart (U.S. Fish & Wildlife Service 2010).

All observations of plant and animal species were recorded in field notes. Field guides were used to aid in the identification of plant and animal species (Arnett and Jacques 1981, Borror and White 1970, Burt and Grossenheider 1976, Gould 1981, Jaeger 1969, Knobel 1980, Robbins et al. 1983, Stark 2000). Observations were aided with the use of 10x50 and 10x42 binoculars. Observations of animal tracks, scat, and burrows were also utilized to determine the presence of wildlife species inhabiting the proposed project area (Cooperrider et al. 1986, Halfpenny 1986, Lowrey 2006, Murie 1974). Aerial photographs and the USGS topographic map were reviewed. Representative photographs were taken of the study site (Figures 4 and 5).

Results

A total of 36 line transects were walked on 22 and 23 October 2017 to inventory biological resources. Weather conditions on 22 and 23 October consisted of cool to warm temperatures (estimated 55 to 85 degrees F), 0% cloud cover, and a slight breeze. A sandy loam surface soil texture was characteristic throughout the study area.

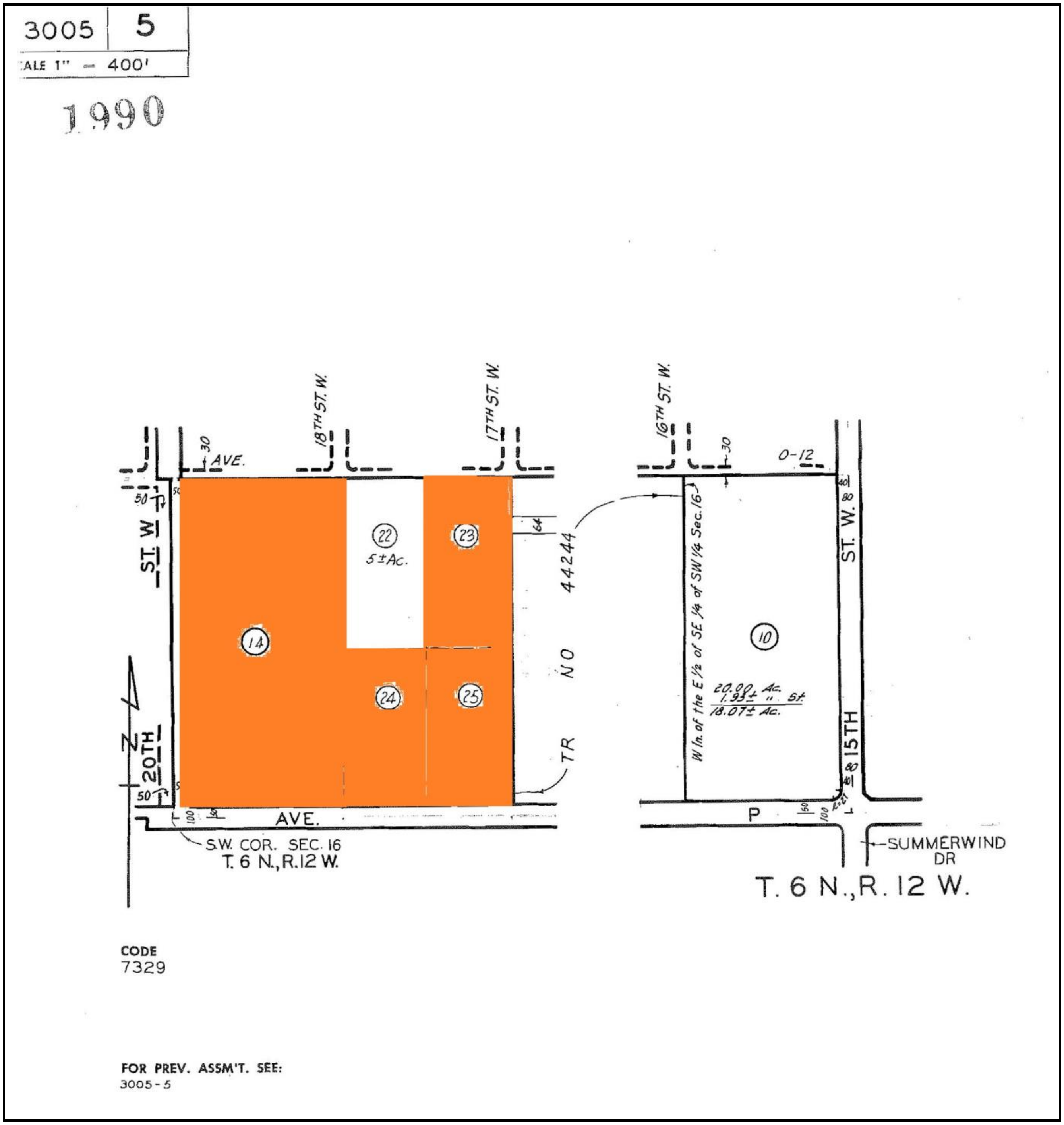

Figure 1. Location of proposed project area as depicted on APN map.

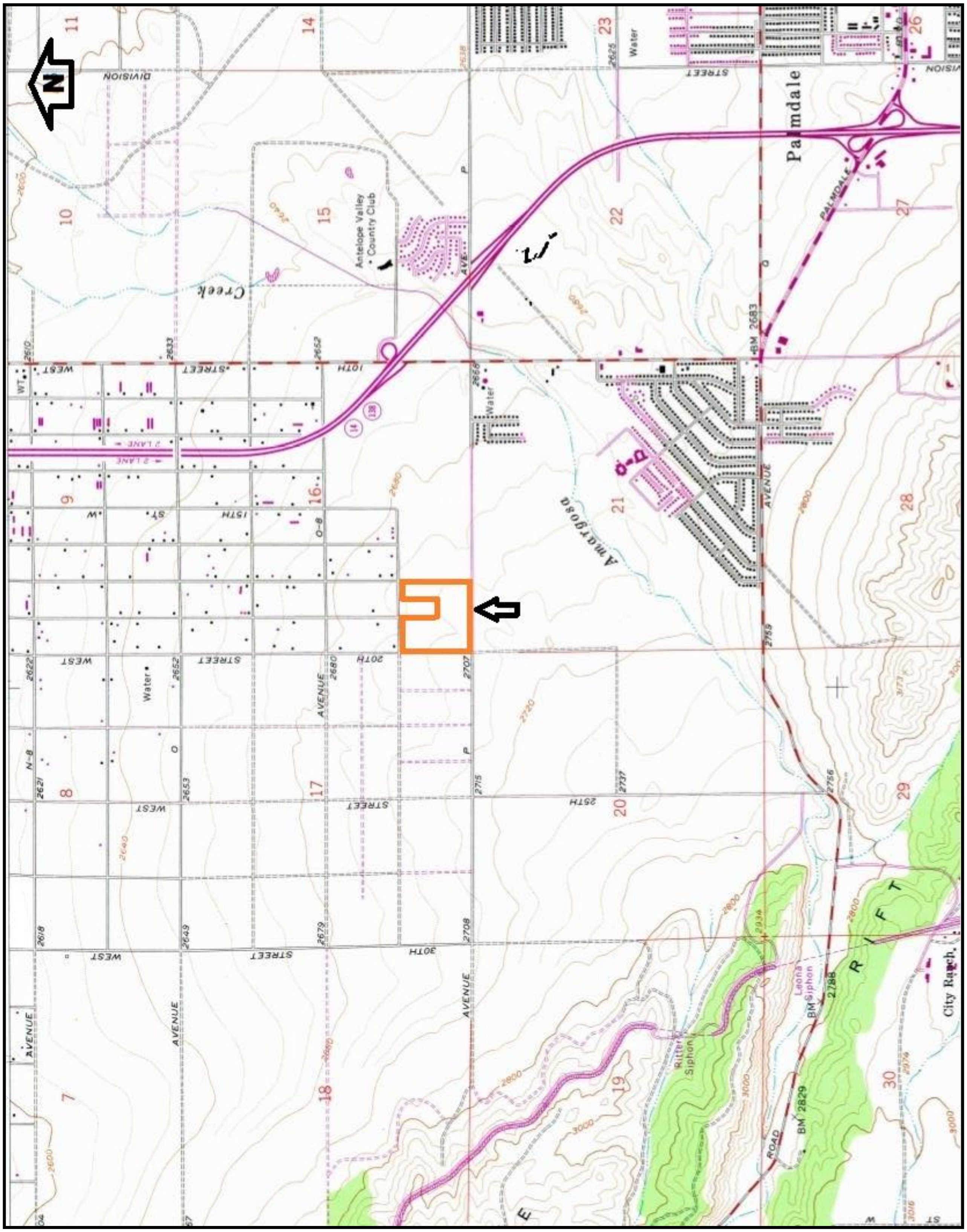

Figure 2. Approximate location of study area as depicted on excerpt from USGS Quadrangle, Palmdale, California, 7.5' 2015.

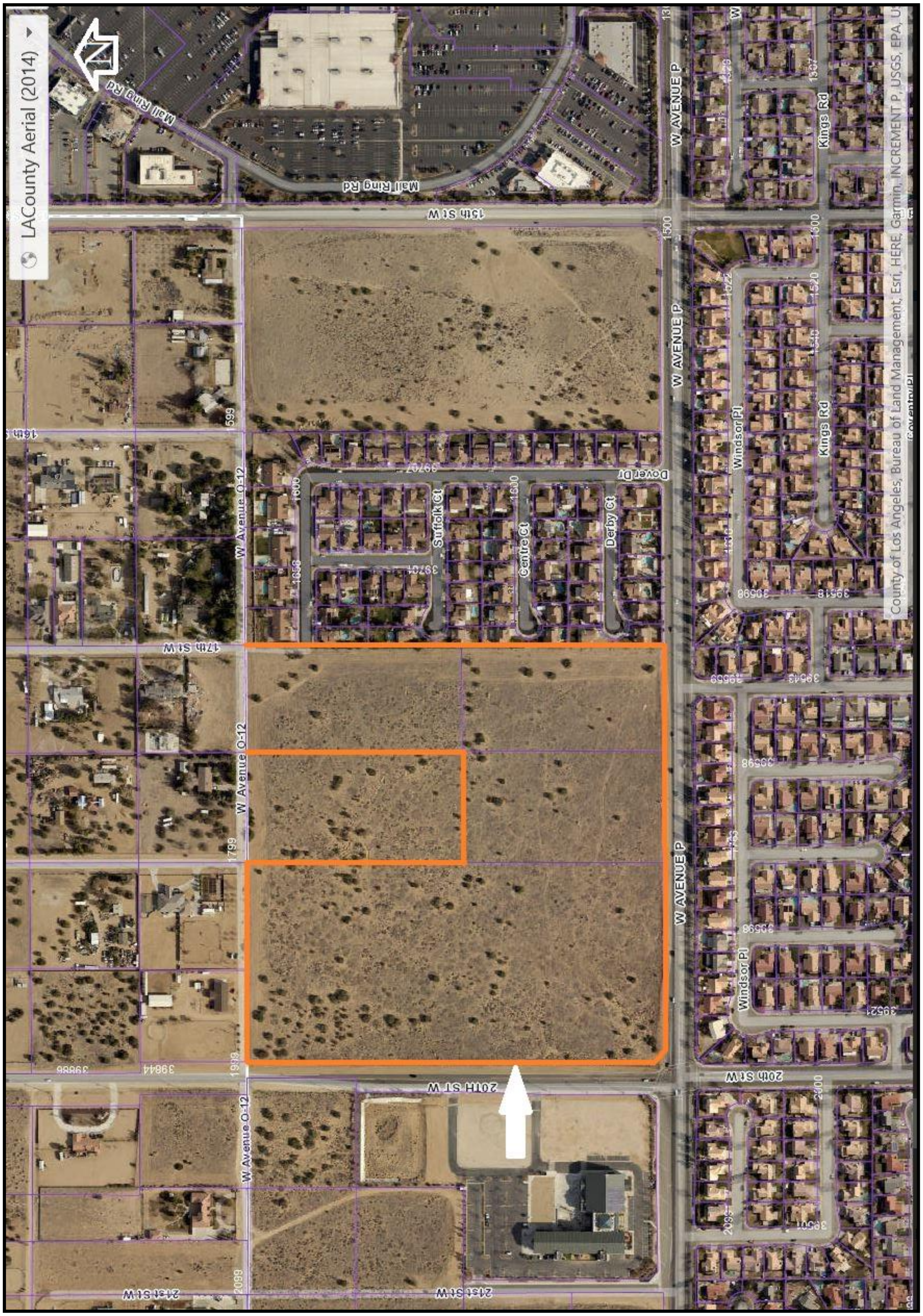

Figure 3. Aerial photo of the study site and surrounding area

Southeast corner looking north

Southwest corner looking northwest

Figure 4. Representative photographs of study site, APNs 3005-005-014, 023, 024, 025, Palmdale, California.


Southern boundary (center) looking north

Figure 5. Representative photograph of study site, APNs 3005-005-014, 023, 024, 025, Palmdale, California.

The proposed project area was characteristic of a Joshua tree and California juniper ecotone (Barbour and Major 1988). A total of forty-three plant species were observed during the line transect survey (Table 1). California juniper was the dominant perennial species within the study site. Cheat grass (*Erodium cicutarium*), Russian thistle (*Salsola iberica*), and fiddleneck (*Amsinckia tessellata*) were the dominant annual species within the study area. A total of 67 Joshua trees were observed within the study site. A total of 236 California juniper trees were observed within the study area. No sensitive plant species were observed within the study area.

A total of thirty-eight wildlife species, or their sign were observed during the line transect survey (Table 2). No desert tortoises or their sign were observed during the field survey. No burrowing owls or their sign were observed during the field survey. No Mohave ground squirrels were observed during the field survey. California ground squirrels (*Citellus beecheyi*) were observed on the study site. One inactive bird nest was observed, in a Joshua tree and no nests were seen in the California juniper trees.

Scattered litter, trash, and debris were observed within the study area. A pile of broken concrete was observed within the study area. Old asphalt was observed along the fence on the northern boundary. A graded and plowed area along the east, north, and south boundaries, and within the southeast corner of the study area were observed. Foot traffic was observed within the study area. An old can dump was observed within the western boundary of the study area. Heavy equipment tracks were observed within the study site. Evidence of fire was observed throughout the study area. A shopping cart, old vehicle car mats, and tires were observed within the study area.

Discussion

Most annual vegetation had already flowered at the time the field survey was conducted. It is probable that some annual species were not visible during the time the field survey was performed. The density of cheatgrass, russian thistle, and fiddleneck present within the study area would be expected to outcompete many other annual species. Although not observed, several wildlife species would be expected to occur within the proposed project area (Table 3).

Human impacts are expected to increase as urban development continues to occur near and adjacent to the study area. Habitat in the general area will continue to become degraded and fragmented. Burrowing animals within the proposed project area are not expected to survive construction activities. More mobile species, such as lagomorphs (rabbits and hares), coyotes (*Canis latrans*), and birds are expected to survive, but they will have less cover and foraging habitat available.

The desert vegetation provides many roosting and nesting sites for birds. Some wildlife species such as the yucca moth (Lepidoptera), cactus wren (*Campylorhynchus brunneicapillus*), and desert night lizard (*Xantusia vigilis*) are found in association with Joshua trees. Many species of birds and their active nests are protected under the Migratory Bird Treaty Act. Vegetation within the study area provides nesting habitat for migratory birds.

Table 1. List of plant species that were observed during the line transect survey of APNs 3005-005-014, 023, 024, 025, Palmdale, California.

Common Name	Scientific Name
Joshua tree	*Yucca brevifolia*
California juniper	*Juniperus californica*
Anderson thorn	*Lycium andersonii*
Peachthorn	*Lycium cooperi*
Felt thorn	*Tetradymia stenolepis*
Mormon tea	*Ephedra nevadensis*
Winter fat	*Eurotia lanata*
Silver cholla	*Opuntia echinocarpa*
Rabbit brush	*Chrysothamnus nauseosis*
Cooper goldenbush	*Haplopappus cooperi*
Goldenhead	*Acamptopappus sphaerocephalus*
Desert straw	*Stephanomeria pauciflora*
Turkey mullein	*Eremocarpus setigerus*
California buckwheat	*Eriogonum fasciculatum*
Short-flowered skeleton weed	*Eriogonum brachyanthum*
Yucca buckwheat	*Eriogonum plumatella*
Spotted buckwheat	*Eriogonum maculatum*
Skeleton weed	*Eriogonum* sp.
Comet blazing star	*Mentzelia albicaulis*
Lacy phacelia	*Phacelia tanacetifolia*
Vinegar weed	*Trichostema lanceolatum*
Autumn vinegar-weed	*Lessingia germanorum*
Indian ricegrass	*Oryzopsis hymenoides*
Desert needlegrass	*Stipa comata*
Blue mantle	*Eriastrum diffusum*
Fiddleneck	*Amsinckia tessellata*
California dodder	*Cuscuta californica*
Herb willow	*Epilobium* sp.
Rattlesnake weed	*Euphorbia albomarginata*
Schismus	*Schismus* sp.
Red stemmed filaree	*Erodium cicutarium*
Puncture vine	*Tribulus terrestris*
Horseweed	*Canyza honariensis*
Prickly lettuce	*Lactuca seriola*
Russian thistle	*Salsola iberica*
Tumble mustard	*Sisymbrium altisissiimum*
Annual burweed	*Franseria acanthicarpa*
Foxtail barley	*Hordeum leporinum*
Red brome	*Bromus rubens*
Oats	*Avena sativa*
Cheatgrass	*Bromus tectorum*
Palo Verde	*Cercidium floridum*
Ornamental tree/shrub	

Table 2. List of wildlife species, or their sign, that were observed during the line transect survey of APNs 3005-005-014, 023, 024, 025, Palmdale, California.

Common Name	Scientific Name
Rodents	Order: Rodentia
Kangaroo rat	*Dipodomys* sp.
Pocket gopher	*Thomomys bottae*
California ground squirrel	*Citellus beecheyi*
Desert cottontail	*Sylvilagus auduboni*
Coyote	*Canis latrans*
Domestic dog	*Canis familiaris*
Horse	*Equus* sp.
Red-tailed hawk	*Buteo jamaicensis*
California quail	*Callipepla californica*
Mourning dove	*Zenaida macroura*
Ring-neck dove	*Streptopelia capicola*
Rock dove	*Columba livia*
Hummingbird sp.	Family: Trochilidae
Common flicker	*Colaptes auratus*
Swallow sp.	Family: Hirundinidae
Common raven	*Corvus corax*
Black Phoebe	*Sayornis nigricans*
Flycatcher sp.	Family: Tyrannidae
Northern mockingbird	*Mimus polyglottos*
Loggerhead shrike	*Lanius ludovicianus*
European starling	*Sturnus vulgaris*
Western meadowlark	*Sturnella neglecta*
House finch	*Carpodacus mexicanus*
White crowned sparrow	*Zonotrichia leucophrys*
Harvester ants	Order: Hymenoptera
Grasshopper	Order: Orthoptera
Painted lady	Order: Lepidoptera
Butterfly, small, brown	Order: Lepidoptera
Wolf spider	Order: Araneida
Spider	Order: Araneida
Bees	Order: Hymenoptera
Termites	Order: Isoptera
Beetle, black	Order Coleoptera
Darkling beetle	*Coelocnemis californicus*
Dragonfly	Order: Odonata
Fly sp.	Order: Diptera
House fly	Order: Diptera

Table 3. List of wildlife species that may occur within the study area, APNs 3005-005-014, 023, 024, 025, Palmdale, California.

Common Name	Scientific Name
Deer mouse	*Peromyscus maniculatus*
Desert woodrat	*Neotoma lepida*
Merriam kangaroo rat	*Dipodomys merriami*
Black-tailed jackrabbit	*Lepus californicus*
Domestic cat	*Felis* sp.
Black-chinned hummingbird	*Archilochus alexandri*
Cactus wren	*Campylorhynchus brunneicapillus*
Say's phoebe	*Sayornis saya*
Horned lark	*Eremophila alpestris*
House sparrow	*Passer domesticus*
Verdin	*Auriparus flaviceps*
Desert spiny lizard	*Sceloporus magister*
Western whiptail	*Cnemidophorus tigris*
Side blotched lizard	*Uta stansburiana*
Gopher snake	*Pituophis melanoleucus*
Desert night lizard	*Xantusia vigilis*
Yucca moth	Order: Lepidoptera
Butterfly (white)	Order: Lepidoptera

The desert tortoise is a state and federally listed threatened species. No desert tortoises or their sign were observed during the field survey. Based on field observations desert tortoises are not expected to occur within the study area.

The Mohave ground squirrel is a state listed threatened species. The proposed project area was not located within the geographic range of the Mohave ground squirrel. The western limit of the geographic range of the Mohave ground squirrel is currently thought to be Highway 14. The study area appeared unsuitable to support Mohave ground squirrels. Human impacts on the site are high. The site is adjacent to development on all four sides. No mitigation for the Mohave ground squirrel is recommended.

Burrowing owls are considered a species of special concern by the California Department of Fish and Wildlife (CDFW). No burrowing owls or their sign were observed during the survey. California ground squirrel burrows provide future potential cover sites and were observed within the study area.

No other state or federally listed threatened or endangered species are expected to occur within the proposed project area (California Department of Fish and Game 2002, Smith and Berg 1988, U.S. Fish & Wildlife Service 1990).

Landscape design should incorporate the use of native plants to the maximum extent feasible. Native plants that have food and cover value to wildlife should be used in landscape design (Adams and Dove 1989). Diversity of native plants should be maximized in landscape design (Adams and Dove 1989).

Recommended Mitigation Measures

A burrowing owl survey will be accomplished within 30 days prior to construction activities to ensure burrowing owls are not present during construction activities. If burrowing owls are discovered the guidance outlined in the CDFW 2012 “Staff Report on Burrowing Owl Mitigation” will be used for addressing burrowing owl issues on the study site (California Department of Fish and Game 2012).

The vegetation within the study area offers potential nesting habitat for migratory birds. If possible, removal of vegetation should occur outside the breeding season for migratory birds. Nesting generally lasts from February to July but may extend beyond this time frame. If vegetation removal will occur during or close to the nesting season, a qualified biologist will survey all areas to be disturbed as close as possible but no more than one week prior to removal. If active bird nests are found, impacts to nests will be avoided by either delaying work or establishing initial buffer areas of a minimum of 500 feet (161 m) for active nesting raptors and 50 feet (16 m) around other active migratory bird species nests. The project biologist will determine if the buffer areas should be increased or decreased based on the nesting bird response to disturbances.

Significance: This project is not expected to result in a significant adverse impact to biological resources.

Native Vegetation Preservation Plan

For parcels containing Joshua trees (*Yucca brevifolia*) and/or California juniper trees, the City of Palmdale requires preparation of a native vegetation preservation plan. A minimum of two Joshua trees per acre should be transplanted in order to satisfy Palmdale City Ordinance requirements.

This study was conducted to provide an estimated density and distribution of Joshua trees and California juniper trees within the proposed project area. Line transects were walked to count, assess the health, and determine the size class of Joshua trees and count California juniper trees. Information on Joshua trees was used to determine the suitability of Joshua trees for transplanting. Joshua trees that grew in clumps and appeared to be growing from the same root ball were counted as a single tree. The height of the highest Joshua tree in the clump was recorded. Joshua trees occurring next to roads that showed evidence of recent use were not marked, due to potential damage to root systems and soil compaction caused by vehicles.

A total of 67 Joshua trees were counted during the line transect survey (Figure 6, Table 4). Joshua tree density was sparse within the study area (Figure 6). Approximately 236 California juniper trees were counted within the study area.

Only Joshua trees that appeared undamaged and without rodent burrows at the base, were marked for transplanting. These Joshua trees were considered to have the best chance for transplanting success. Joshua trees that are smaller than five feet in height could be transplanted by hand, but are expected to have a low survivability rate if moved by using hand tools. A total of 38 Joshua trees appeared suitable for transplanting and were temporarily marked with pink flagging tape (Figure 6, Table 4). Other Joshua trees were present that if left on-site, could continue to thrive if not moved. California junipers are not expected to survive transplanting and were not marked.

Joshua trees should be transplanted to areas not prone to future disturbance. Joshua trees can be transplanted in landscape easements, any other potential buffer areas, or in any street landscaping. A minimum of 80 Joshua trees (2/acre) should be transplanted in order to satisfy Palmdale City Ordinance requirements, however only 38 Joshua trees were considered suitable for transplanting. If the Joshua trees cannot be transplanted or retained in landscape easements, other buffer areas, or street landscaping, then the following steps will be taken in sequential order.

1. Joshua trees will be made available to the City of Palmdale.
2. Joshua trees will be offered to other development projects.
3. Joshua trees will be made available to the public.
4. Joshua trees will be “banked” at an approved location.
5. An in lieu fee will be paid.

A two year maintenance program will be established in accordance with the guidelines of the Palmdale City Ordinance. Joshua trees should be planted at least ten feet (3 m) apart and well-watered immediately. Joshua trees transplanted during fall, winter, or early spring should be adequately watered once a week for two months following transplanting. Joshua trees transplanted during late spring or summer should be adequately watered until the end of hot

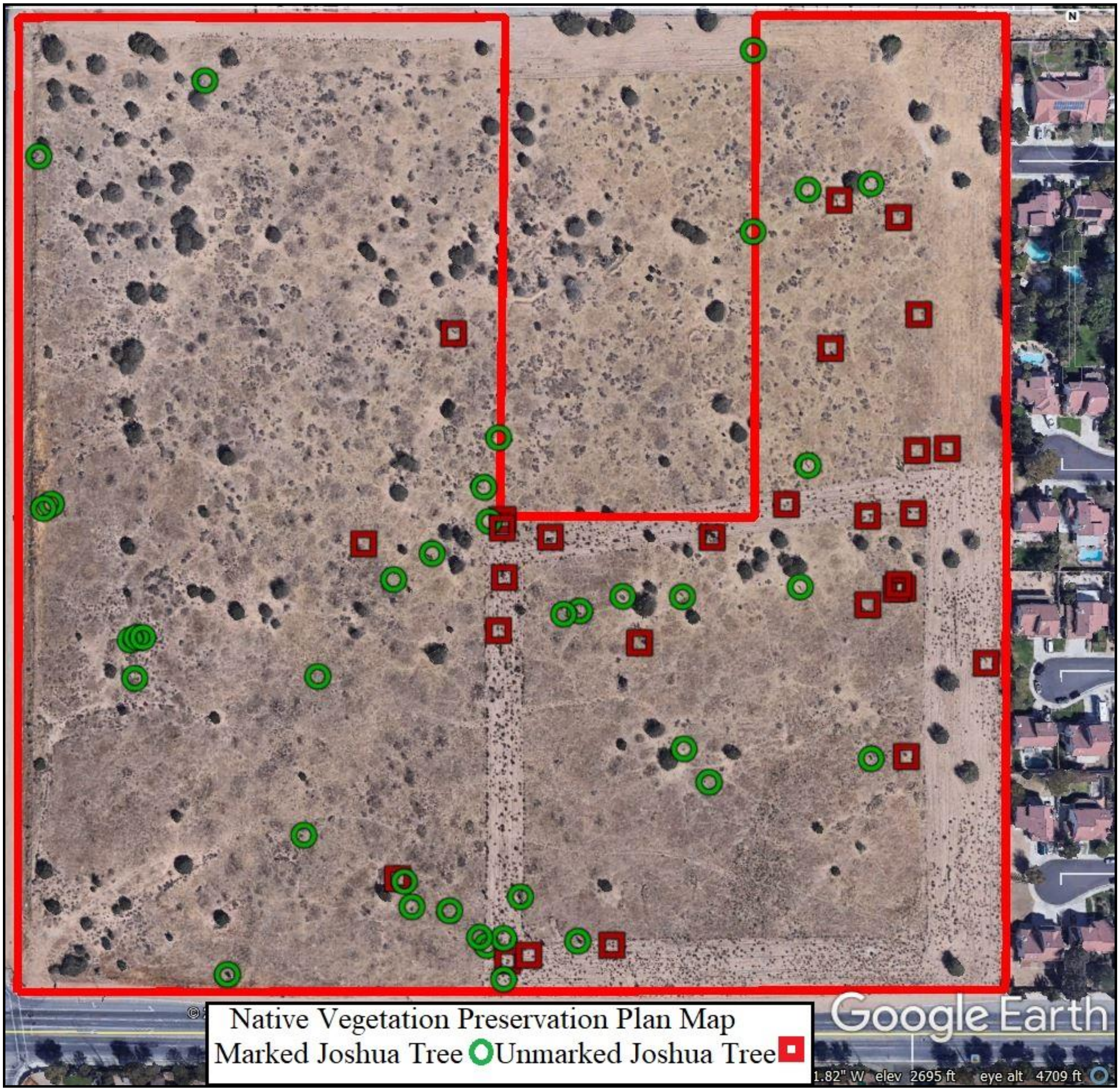

Figure 6. Approximate location of Joshua trees within the study site.

Table 4. Number of Joshua trees by size class occurring within the study area, APNs 3005-005-014, 023, 024, 025, Palmdale, California.

Size Class of Joshua trees (in feet)	Total Number of Joshua trees (35 Acres)	Number of Joshua trees marked by size class
1-3	18	10
4-6	22	11
7-9	16	14
10-12	5	1
>12	6	2
Total	67	38

weather. If sufficient rainfall or low evaporation rates occur and the soil remains moist these watering schedules should be reduced in frequency. Joshua trees should be planted in a sandy, well-drained soil. Transplanting with some of the native shrubs immediately around the Joshua tree may help in survival of individual trees. Construction activity should not occur within twenty-five feet (8 m) of transplanted Joshua trees.

The Palmdale City Planning Department will require Joshua trees to be permanently marked when transplanted to another location. The goal of marking Joshua trees is to allow the Palmdale City Planning Department to track survival of Joshua trees and have them replaced as necessary by the project proponent. Permanent marking could include metal tags, markers such as stakes in the ground, or other means. The method of permanent marking utilized should not harm the Joshua trees. The permanent marking should include information that designates the date the Joshua tree was transplanted, project site the Joshua tree came from, and point of contact name, address, and phone number. Prior to transplanting Joshua trees, the method of marking and information provided should be submitted to the Palmdale Planning Department for approval.

Two years following Joshua tree transplanting a written report should be submitted to the Palmdale City Planning Department. This report should provide the number of Joshua trees transplanted, the date(s) of transplanting, the method of transplanting, dates Joshua trees are watered, and the number of Joshua trees surviving. The Palmdale City Planning Department should be able to provide a list of persons that can assist in transplanting Joshua trees.

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APPENDIX: C

GEOTECHNICAL INVESTIGATION REPORT
FOR PROPOSED
SINGLE-FAMILY, MULTI-FAMILY AND
COMMERCIAL DEVELOPMENT
PALMDALE, LOS ANGELES COUNTY, CALIFORNIA
APN 3005-005-014, 023, 024, 025

Prepared by:
BRUIN GEOTECHNICAL SERVICES, INC.
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LANCASTER, CA 93534

November 06, 2017

J.N. 17-113

BRUIN GSI

SOIL AND MATERIAL
TESTING AND INSPECTIONS

November 06, 2017

J.N. 17-113

Mr. Phillip Terry
Cage Palmdale, LLC
1666 McCadden Place
Hollywood, CA 90028

Subject: Geotechnical Investigation Report for Proposed Residential Development located at the Northeast corner of 20th Street West and Ranch Vista Boulevard, Palmdale, California; APN 3005-005-014, 023, 024, 025

Dear Mr. Terry:

Presented herewith is the report of our Geotechnical Investigation Report for the subject project. Our work was performed in accordance with the scope of work outlined in our original proposal dated July 18, 2017

This report presents the results of our field investigation, laboratory testing and our engineering judgment, opinions, conclusions and recommendations pertaining to the proposed development.

It has been a pleasure to be of service to you on this project. Should you have any questions regarding the contents of this report, or should you require additional information, please contact the undersigned at (661) 273-9078.

Respectfully submitted,

BRUIN GEOTECHNICAL SERVICES, INC.

Ryan D. Duke, P.E.
RDD/mes

REGISTERED PROFESSIONAL ENGINEER
RYAN DANIEL DUKE
9/2018
79729
CIVIL ENGINEER
STATE OF CALIFORNIA

Distribution: 4-Client

GEOTECHNICAL INVESTIGATION REPORT

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FIGURES

Figure 1	Vicinity Map
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Appendix A	Boring Logs and Soils Classification Key
Appendix B	Laboratory Test Data
Appendix C	USGS Seismic Design Summary Report
Appendix D	Earthwork and Grading Specifications for Rough Grading

GEOTECHNICAL INVESTIGATION REPORT
PROPOSED SINGLE-FAMILY, MULTI-FAMILY AND COMMERCIAL DEVELOPMENT
APN 3005-005-014, 023, 024 & 025
PALMDALE, LOS ANGELES COUNTY, CALIFORNIA

1.0 INTRODUCTION

This report presents the results of our geotechnical investigation performed by Bruin Geotechnical Services, Inc. for the proposed residential development, based on the preliminary site plans provided by the client. This report is specific to the proposed development.

The purpose of this investigation was to evaluate the subsurface soil conditions, to evaluate in-place characteristics, and to provide geotechnical recommendations relative to earthwork and grading, design parameters for construction of the proposed structure addition and improvements (utilities, etc.) associated with the proposed development.

The scope of the authorized investigation included the following tasks:

- performing a site reconnaissance,
- conducting field subsurface exploration through soil borings and sampling
- laboratory testing program of selected soil samples
- performing engineering analyses of the data
- Preparing this Geotechnical Investigation Report.

This study also includes a review of published and unpublished literature and geotechnical maps with respect to active and potentially active faults located in proximity to the site which may have impact on the seismic design of the proposed structure.

2.0 SITE LOCATION AND DESCRIPTION

The subject site is located at the northeast corner of Rancho Vista Boulevard (Avenue P) and 20th Street West in the city of Palmdale, Los Angeles County, California. The subject site consists of approximately 35 acres. At the time of our investigation, the subject site was undeveloped and vacant of structures.

The subject site is located in a developed area, with residential developments on the north and east side property lines, a church development on the west side of 20th Street West (west property line) and residential on the south side of Ranch Vista Boulevard (south property line).

The site topography is relatively flat, with slight undulations and a general slope to the northeast with drainage by sheet flow at approximately two (2) percent across the site. The elevation of the subject site is approximately 2,700 feet above mean sea level.

The general location of the subject site is shown on Figure 1.

3.0 PROPOSED GRADING AND CONSTRUCTION

Based on our review of the preliminary site plans, it appears the proposed earthwork will be minimal, with anticipated cuts and fills of approximately 1-3 feet to achieve design grades.

Although construction details are not available at the present time, it is expected that the structures will be a single-story residential units on the northern portion of the site and two story multi-family units (apartments) on the southern portion of the site. It is also anticipated that a small commercial (retail) development may be constructed at the southwest corner of the site, including two-story structures and parking lot. We anticipate typical wood-framed construction with conventional concrete continuous and isolated foundations and slab-on-grade floors. No basements are planned. We anticipate loads of 1-3 kips per lineal foot. Exterior improvements are anticipated to include concrete flatwork, asphalt-concrete parking and off-site roadway construction. It is anticipated that the drainage will consist of sloped surfaces to drainage swales to an approved area. The proposed structures will be connected to a public sewer system and existing utilities lines from the street.

4.0 GEOTECHNICAL INVESTIGATION

The geotechnical investigation included a field exploration program and a laboratory testing program. These programs were performed in accordance with our revised proposal for Geotechnical Investigation Report dated July 18, 2017. The scope of work did not include environmental assessment or investigation for the presence or absence of hazardous substances or toxic materials in structures, soil, surface water, groundwater or air, below or around the site. The field exploration and laboratory testing programs are described below.

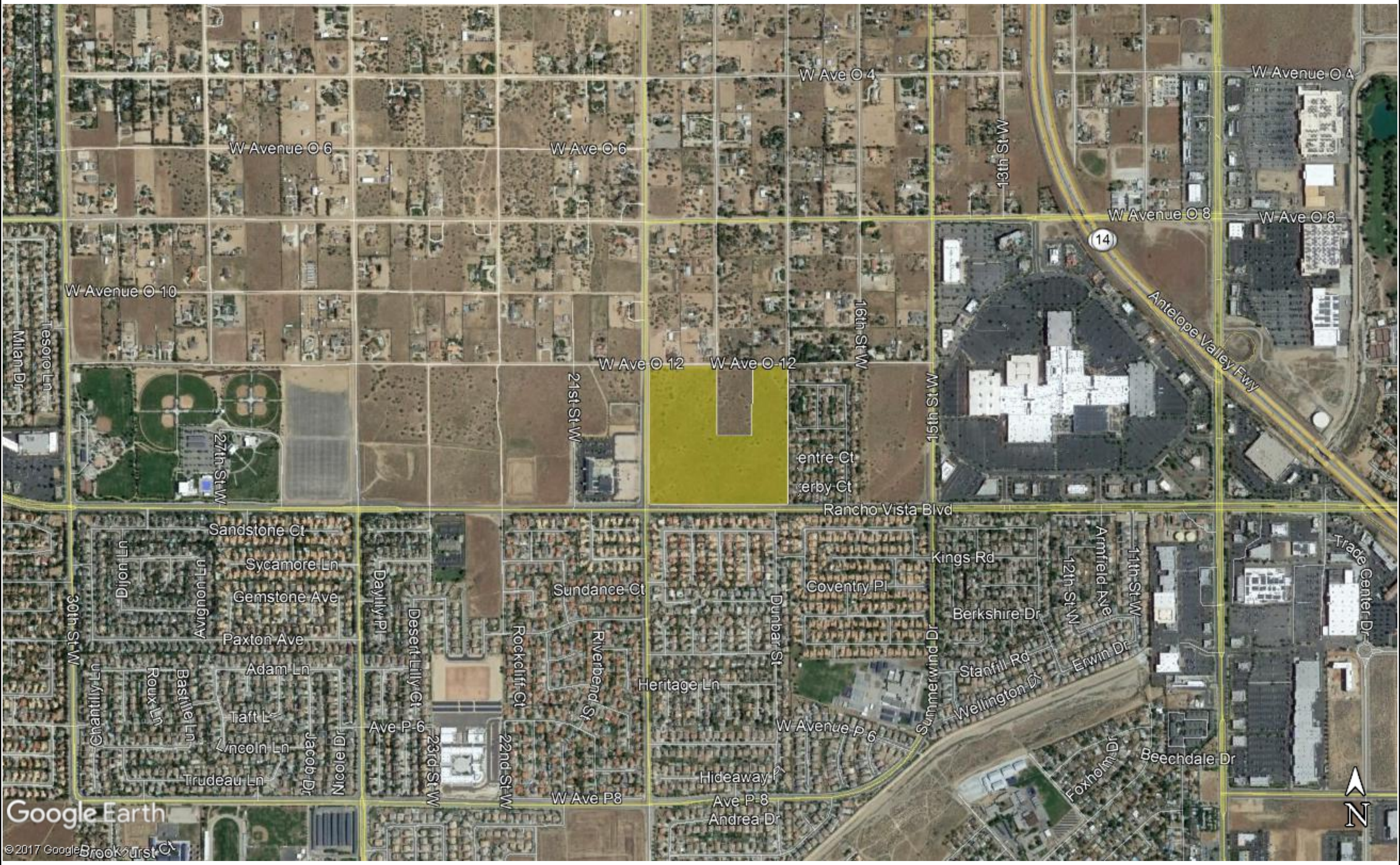
4.1 Field Exploration Program

The field exploration program was initiated on September 22, 2017, under the technical supervision of our engineer. A total of fifteen (15) exploratory borings were drilled using a CME 75 drill rig with 8” hallow stem auger. The borings were advanced to maximum depths of thirty one (31) feet below ground surface (bgs).

Figure 1

Vicinity Map

N.T.S.



Bruin GSI

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Cage Development
Proposed Residential Development
APN 3005-005-014, 023, 024, 025
Palmdale, Los Angeles County, California

Job Number:	**Date:**
17-113	9/22/17

The approximate locations of the borings within the area of the proposed construction are shown on Figure 2.

Logs of subsurface conditions encountered in the borings were prepared in the field by a representative of Bruin GSI. Soil samples were obtained at various depth intervals, consisting of relatively undisturbed brass ring samples (Modified California split-spoon sampler) and Standard Penetration Test (SPT) samples driven by a 140 pound hammer falling 30 inches. Bulk samples were also collected at various depths from 0 to 5 feet below existing ground surface. The soil samples were returned to the laboratory for analysis and testing. Final boring logs were prepared from the field logs and are presented in Appendix A.

4.2 Laboratory Testing

Selected samples collected during trenching activities were tested in the laboratory to assist in evaluating engineering properties of subsurface materials deemed within structural influence at the site.

The samples were classified in accordance with the Unified Soils Classification System and a testing program was established. The samples were tested to determine the following:

- In-situ moisture and density determination
- Consolidation potential
- Shear strength
- Expansion index
- Chemical analyses, including pH, resistivity, soluble sulfates and soluble chlorides

The following classification tests were performed:

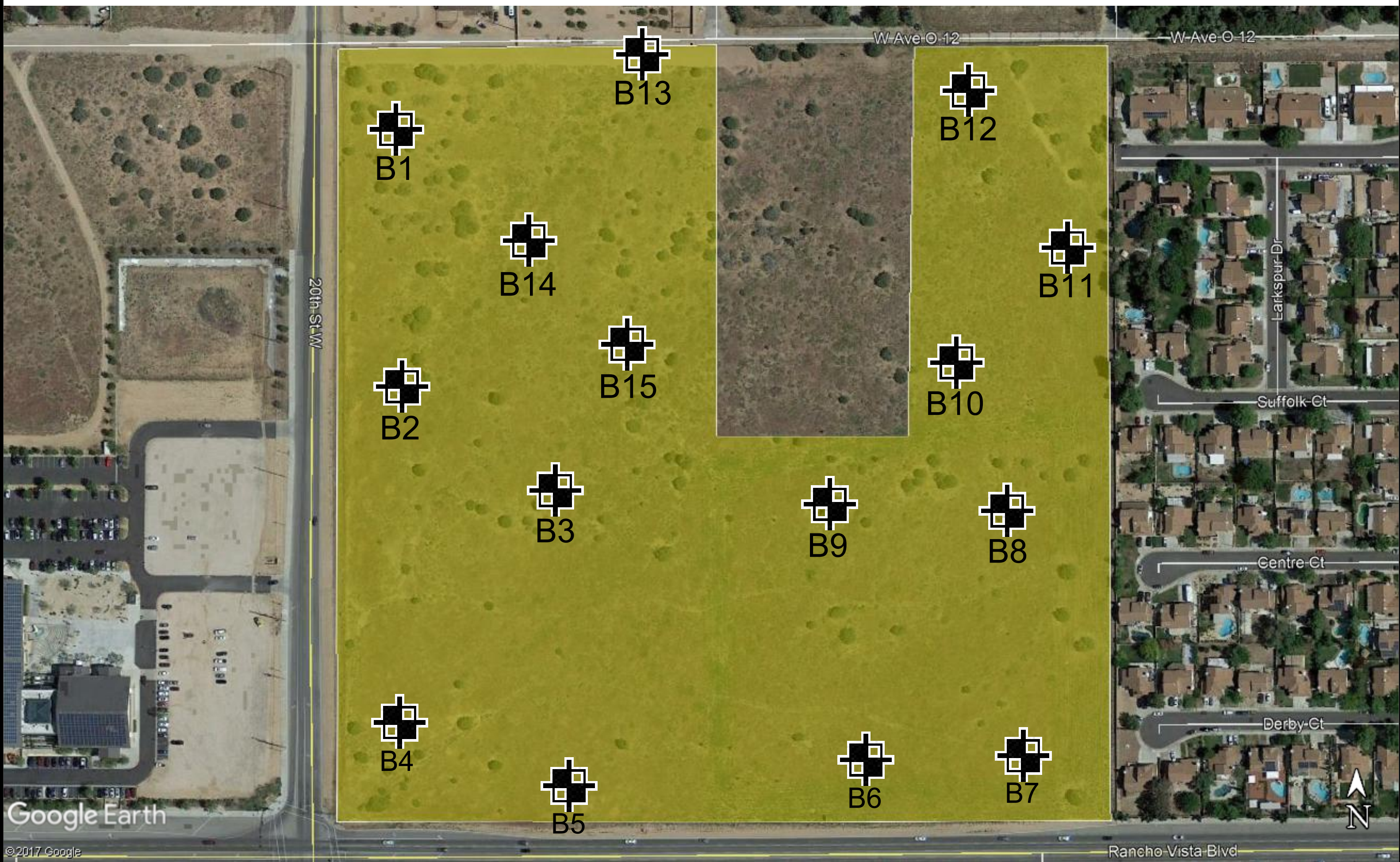
• Identification of soils	ASTM D 2488
• Expansion Index	ASTM D 4829
• Maximum density – Optimum moisture	ASTM D 1557
• Material Finer than the No. 200 Sieve	ASTM D 1140
• Sand Equivalent Value	ASTM D 2419

Tabular and graphic test results are presented in Appendix B.

Figure 2

Boring Location Map

N.T.S.



B2 = Denotes Approximate Boring Location

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5.0 CONCLUSIONS

The following conclusions for the site are based on the results of the field exploration and laboratory testing programs and represent professional opinions.

5.1 Site and Subsurface Conditions

Native alluvial materials were encountered within all of our exploratory borings. The native materials were noted to be slightly moist to moist and loose to dense. The soil strata encountered consisted of silty sand (SM) with occasional gravel to ½”. Slightly cemented soils were encountered at various locations. For more detailed descriptions of the subsurface materials refer to the boring logs in Appendix A.

5.2 Groundwater Conditions

Groundwater was not encountered in any of our exploratory borings, at least to the maximum depth explored (31 feet bgs). Bruin GSI reviewed available reports and electronic data bases to assess historic water level conditions in the vicinity of the proposed site. Sources reviewed included the historically highest groundwater contours prepared by County of Los Angeles, Department of Public Works, Water Resources Division electronic database, historically highest groundwater levels in the immediate site vicinity indicate that groundwater level at the site are over 100 feet bgs. Based on this information, groundwater is not a design factor for this project.

5.3 Soil Engineering Properties

Physical tests were performed on the relatively undisturbed samples to characterize the engineering properties of the native soils. Moisture content and dry unit weight determinations were performed on the sample to evaluate the in-situ unit weights of the different materials. Moisture contents were generally 2-5 percent, with an occasional moisture content of 8-10 percent. In-place dry densities were generally 108.0 pounds per cubic foot (PCF) to 115.0 pcf. In-place densities in the upper five feet were typically below 108.0 pcf. Occasional very dense soil (over 115.0 pcf) was encountered at various locations at depth. Moisture content and dry unit weight results are shown on the boring logs in Appendix A.

The expansion index tests indicate that the surficial soils are within the “very low” expansion category.

Sieve analyses were performed on selected samples to evaluate the percent fines of different lithologic layers. Consolidation test results reveal the upper four to five (4-5) feet of soil has a moderate tendency to hydroconsolidate.

6.0 SEISMIC HAZARDS

The project site is locate in a seismically active are typical of Southern California and likely to be subjected to a strong ground shaking due to earthquakes on nearby faults.

The San Andreas Fault zone is the largest active fault rift zone, which is several miles wide, and passes through the Antelope Valley south of the subject site, extending from the Gulf of Mexico through the western portion of the State of California to a point at Cape Mendocino in northern California. The San Andreas Fault is predicted to have an event every 100-200 years based on geologic records. The San Andreas Fault has had two major eruptions in the last 150 years: 1) in the Southern California area in 1857, and 2) in San Francisco in 1906. In each event, approximately 320 kilometers of surface rupture has taken place, as well as a horizontal displacement of approximately 9 meters. Additional faulting has occurred adjacent to the San Andreas Fault causing numerous events of various magnitudes throughout the length of the San Andreas Fault.

The project site is located in an area in which active seismic occurrences are recorded on a yearly basis. Seismic studies conducted show a major break along the San Andreas Fault could be responsible for an event of approximately 8.4 on the Richter scale. A seismic event of this magnitude could cause bedrock accelerations as large as 0.5g. Events of this magnitude are anticipated to occur approximately every 150 years. The last occurrence of this magnitude was in 1857.

No known active faults have been mapped across the subject site. The potential hazards due to active fault ground rupture are considered minimal. According to current publications by the State of California, the project site is not located within the Alquist-Priolo special studies zone.

6.1 IBC Design Parameters

The following coefficients have been estimated in accordance with the requirements of the 2012/2015 IBC, utilizing the USGS U.S. Seismic Design Maps Application:

http://earthquake.usgs.gov/designmaps/us/application.php

The following values are provided, based on the approximate latitude and longitude at the southwest corner of the subject site:

Latitude	34.5787°
Longitude	118.1090°

Spectral Response Acceleration - S_{DS}	1.587g	0.2(sec)

Spectral Response Acceleration - S_{D1}	1.110g	1.0(sec)
Mapped Spectral Acceleration - S_S	2.381g	0.2(sec)
Mapped Spectral Acceleration - S_1	1.110g	1.0(sec)

Site Classification (2013 CBC, further defined in ASCE7-10, Chapter 20) = D

The actual method of seismic design should be determined by the Structural Engineer.

Refer to Appendix C for the Design Maps Summary Report provided by the USGS website.

6.2 Liquefaction Potential

Liquefaction is a seismic phenomenon in which loose, saturated, granular (non-cohesive) soils react as a fluid when subject to high-intensity ground shaking. Research and historical data indicate loose to medium dense granular soils with a specific range of grain size distribution, saturated by a relatively shallow groundwater table are most susceptible to liquefaction.

The effects of liquefaction on level ground include settlement, sand boils and bearing capacity failures below structures.

In view of the relatively firm silty sand encountered in the borings, relative densities, and depth to groundwater (over 100 feet), our preliminary liquefaction analysis indicates the potential for on-site liquefaction or seismically induced dynamic settlement is not probable.

6.2.1 Other Liquefaction Associated Hazards

Potential hazards associated with liquefaction include lateral spreading and slow slides, foundation bearing failure, and ground surface settlement. Considering the upper 50 feet of the native soils are not likely to liquefy, these hazards are not considered to be design factors for this project.

6.3 Differential Soil Settlement

Differential soil settlement occurs when supporting soils are not uniform in density or classification and seismic shaking causes one type of soil to settle more than the other. When unaccounted for in design, such settlement can result in damage to structures, pavement and subsurface utilities. Based on the subsurface data obtained during the investigation, the on-site soils are relatively uniform, consisting of predominantly medium dense soils that should not be prone to differential settlement under earthquake loading conditions.

Recompaction of the upper site soils is intended to remedy the potential for surficial differential settlement due to structures supported on non-uniform thickness of compacted fill.

Settlement of structures founded on compacted fill will be relatively small, less than 1”. Differential settlement is anticipated to be on the order of 50 percent of the total settlement in a thirty foot span. Most settlement should take place during construction.

7.0 111 STATEMENT

Subsequent to compliance with the recommendations provided in this report and based on the site reconnaissance, subsurface exploration, and laboratory analysis, it is our opinion the proposed structures will be safe from hazards associated with faulting, landslides, slippage, and settlement. The proposed development will not adversely impact the existing geologic stability of adjacent sites.

8.0 EFFECT OF PROPOSED GRADING ON ADJACENT PROPERTIES

It is our opinion that the proposed grading and construction will not adversely affect the stability of adjoining properties provided that grading and construction are performed in compliance with the recommendations presented herein.

9.0 GEOTECHNICAL RECOMMENDATIONS

Based upon the results of our investigation, the proposed development is considered feasible from a geotechnical standpoint provided the recommendations presented herein are incorporated into the design and construction. If changes in the design of the structure are made or variations of changed conditions are encountered during construction, Bruin GSI should be contacted to evaluate their effects on these recommendations. The following geotechnical engineering recommendations for the proposed development are based on observations from the field investigation program and the laboratory test results and our experience with sites of similar conditions.

The local Department of Building and Safety should be contacted prior to start of construction to assure the project is properly permitted and inspected during construction. Any grading performed at the site shall be incompliance with the recommendations provided in this report, the local building code and the Earthwork and Grading Specifications for Rough Grading presented in Appendix D.

Field observations and testing during rough-grading operations should be provided by Bruin GSI so a decision can be formed regarding the adequacy of the site preparation, the acceptability of fill materials, and the extent to which the earthwork construction and the degree of compaction comply with the project geotechnical specifications. **Any work related to grading performed without the full knowledge of, and under the supervision of the Geotechnical Consultant, may render the recommendations of this report invalid.**

9.1 Earthwork

Prior to any grading, the site should be cleared and grubbed. All pavements, vegetation, trash and debris shall be removed from the area to be graded and should not be incorporated into engineered fill.

Any depressions resulting from removals during grubbing process (trees etc.) shall be observed by the Geotechnical Consultant. Depressions requiring backfill within structural areas will require placement of engineered fill, observed and tested by the Geotechnical Consultant.

It is our professional opinion that the grading of the site can be performed with conventional earth-moving equipment.

9.2 Remedial Grading for Building Pads

Subsequent to clearing and grubbing, the existing native soils shall be <u>excavated to a depth of fifty four (54) inches below existing grade or finish grade, whichever is lower.</u> The excavation shall extend a minimum of five (5) feet beyond the limits of the proposed foundations.

The Geotechnical Consultant shall inspect the resulting surfaces prior to scarification and fill placement. A minimum of twenty four (24) inches of compacted fill is required beneath the proposed foundations.

Subsequent to approval of the resulting surface by the Geotechnical Consultant, the resulting soil surface shall be scarified an additional six (6) inches, properly moisture conditioned or aerated to near optimum moisture content, and mechanically compacted with heavy compaction equipment to 90% relative compaction as determined by ASTM D 1557 test method. **Compaction shall be verified by testing.**

9.3 Remedial Grading for Flexible (asphalt-concrete) and Rigid (PCC) Pavement and Exterior Flatwork

Subsequent to clearing and grubbing the site, the existing native soils shall be excavated twelve (12) inches below existing grade or finish grade, whichever is lower. The exposed surface shall be scarified an additional six (6) inches. The excavation shall extend a minimum of three (3) feet beyond the limits of the proposed pavement and flatwork. The Geotechnical Consultant shall inspect the resulting surfaces prior to fill placement.

Subsequent to approval of the resulting surface by the Geotechnical Consultant, the resulting soil surface shall be properly moisture conditioned or aerated to near optimum moisture content, and mechanically compacted with heavy compaction equipment to 90% relative compaction (**95% relative compaction beneath proposed PCC pavement)** as determined by ASTM D 1557 test method. **Compaction shall be verified by testing**.

9.4 Fill Placement and Compaction Requirements

Native soils may be used as engineered fill. Materials for engineered fill should be free of organic material, debris, and other deleterious substances, and should not contain rocks greater than 6 inches in maximum dimension.

All native soil fill should be placed in 8-inch-thick maximum lifts measured loose, moisture conditioned or air dried as necessary to achieve near optimum moisture condition, and then compacted in place to a maximum relative compaction of 90 percent (95% beneath PCC pavement) as determined in accordance with Test Method ASTM D 1557.

All import soil fill (meeting the requirements of Section 9.6) should be placed in 8-inch-thick maximum lifts measured loose, moisture conditioned or air dried as necessary to near optimum moisture condition, and then compacted in place to a maximum relative compaction of 90 percent (95% beneath PCC pavement) as determined in accordance with Test Method ASTM D 1557.

<u>A representative of the project consultant should be present on-site during grading operations to verify proper placement and compaction of all fill, as well as to verify compliance with the other geotechnical recommendations presented herein.</u>

9.5 Fill Slope Construction and Stability

Provided all material is properly compacted as recommended, fill slopes may be constructed at a 2:1 (horizontal to vertical) gradient or flatter. Permanent cut slopes may be constructed at 2:1 or flatter. Fill slopes constructed as recommended at a slope ratio not exceeding 2:1 (horizontal: vertical), are expected to be both grossly and surficially stable and are expected to remain so under normal conditions.

Proper drainage should be planned so water is not allowed to flow over the tops of slopes. The slopes should be planted as soon as possible to minimize erosion and maintenance.

If slopes are planned steeper than 2:1, the Geotechnical Consultant shall be notified for slope stability determinations.

9.6 Imported Soils

If imported soils are required to complete the planned grading, these soils shall be free of organic matter and deleterious substances, meeting the following criteria:

- 100% passing a 2-inch sieve
- 60% to 100% passing the #4 sieve
- no more than 20% passing a #200 sieve
- expansion index less than 20
- liquid limit less than 35
- plasticity index less than 12
- R-value greater than 40
- Low corrosion potential
  - Soluble Sulfates less than 1,500 ppm
  - Soluble Chlorides less than 150 ppm
  - Minimum Resistivity greater than 8,000 ohm-cm

Prospective import soils should be observed, tested and pre-approved by this firm prior to importing the soils to the site. Final approval of the import soil will be given once the material is on site either in place or adequate quantities to finish the grading.

9.7 Native Soil Shrinkage

A shrinkage factor of fifteen to twenty (15-20) percent may be utilized for earthwork quantity calculations. This estimate is based on the limited data collected from the subsurface exploration and laboratory test data with an average degree of compaction of 92 percent and may vary depending on contractor methods.

During compaction, an additional 0.1-foot subsidence of the underlying soil is estimated. Losses from site clearing and grubbing operations mat effect quantity calculations and should be taken into account. Actual shrinkage of the soil may vary.

We recommend monitoring the rough grading excavations by survey with comparison to grading contractor earthwork yardage estimates to determine a closer estimate of actual shrinkage so adjustments (if necessary) may be made during grading.

9.8 Grading Observations and Testing

The grading of the site shall be observed and tested by the Geotechnical Consultant to verify compliance with the recommendations. Any grading performed without full knowledge of the Geotechnical Consultant may render the recommendations of this report invalid.

10.0 POST-GRADING AND DESIGN CONSIDERATIONS

10.1 Pad Drainage

A surface drainage system consisting of a combination of sloped concrete flatwork, swales and sheet flow gradients in landscape areas, and roof gutters and downspouts should be designed for the site. The roof gutters and downspouts should also be tied directly into the proposed area drain system. Drainage from structures should be designed at minimum 2% gradient to approved areas. The purpose of this drainage system will be to reduce water infiltration into the subgrade soils and to direct surface waters away from building foundations, walls and slope areas.

Concrete flatwork surfaces and paved sloped surfaces should be inclined at a minimum gradient of 1 percent away from the building foundations and similar structures. A minimum 12-inch-high berm should be maintained along the top of the descending slope to prevent any water from flowing over the slope.

The owner is advised that all irrigation and drainage devices should be properly maintained throughout the lifetime of the development.

10.2 Foundation Design Recommendations

The proposed structure shall be constructed on a conventional concrete foundation system. Provided the recommendations in this report are incorporated into site development, foundation for load bearing walls and interior columns constructed on compacted certified fill may be designed as follows:

10.2.1 Allowable Bearing Capacity

Continuous Foundations Design Values: An allowable "net" bearing capacity of 1,500 p.s.f. can be utilized for dead and sustained live loads. This value includes a minimum safety factor of three, and may be increased by 1/3 for total loads, including seismic forces.

Continuous foundations for single-story and two-story structures should be a minimum of twelve inches in width and fifteen and eighteen inches in thickness, respectively. Reinforcement shall consist of a minimum of two #4 bars, one top and one bottom. Actual depth, width, and reinforcement requirements for continuous foundations will be dependent on applicable sections of the governing building code and requirements of the structural engineer.

The allowable bearing capacity for continuous foundations may be increased by 200 psf for each additional six inches of foundation depth and 200 psf for each additional one foot of foundation width. The allowable bearing capacity should not exceed 2,100 p.s.f. for continuous foundations to keep estimated settlements within allowable limits.

Isolated (Column) Foundations Design Values: An allowable "net" bearing capacity of 1,800 p.s.f. can be utilized for dead and sustained live loads. This value includes a minimum safety factor of three, and may be increased by 1/3 for total loads, including seismic forces.

Isolated foundations should be a minimum of twenty four inches square inches and eighteen inches thick. Actual depth, width, and reinforcement requirements for continuous foundations will be dependent on applicable sections of the governing building code and requirements of the structural engineer.

The allowable bearing capacity for continuous foundations may be increased by 200 psf for each additional six inches of foundation depth and 200 psf for each additional one foot of foundation width. The allowable bearing capacity should not exceed 2,100 p.s.f. for continuous foundations to keep estimated settlements within allowable limits.

10.2.2 Lateral Load Resistance

Lateral load resistance for the spread footings will be developed by passive soil pressure against sides of footings below grade and by friction acting at the base of the concrete footings bearing on compacted fill. An allowable passive pressure of 275 psf per foot of depth may be used for design purposes. An allowable coefficient of friction 0.27 may be used for dead and sustained live load forces to compute the frictional resistance of the footings constructed directly on compacted fill. Safety factors of 2.0 and 1.5 have been incorporated in development of allowable passive and frictional resistance values, respectively. Under seismic and wind loading conditions, the passive pressure and frictional resistance may be increased by one-third.

10.2.3 Footing Reinforcement

Reinforcement for footings should be designed by the structural engineer based on the anticipated loading conditions and expansion index of the supporting soil. Preliminary expansion index for the native soil is categorized as "very low" as determined by ASTM D 4829. Footings should be reinforced with a minimum of two No. 4 bars, one top and one bottom.

Based on the preliminary chemical analysis performed on a sample of the native soil, foundation concrete shall consist of type II cement with a minimum compressive strength of 2,500 psi as indicated in the ACI 318 Table 4.3.1. A higher compressive strength may be required by the structural engineer. Additional soil chemical analysis during grading is recommended.

10.2.4 Footing Observations

All footing trenches should be observed by a representative of the project geotechnical consultant to verify that they have been excavated into competent soils prior to placement of forms, reinforcement or concrete. The excavations should be trimmed neat, level and square. All loose, sloughed or moisture-softened soils and/or any construction debris should be removed prior to placing of concrete. **Excavated soils derived from footing and/or utility trenches should not be placed in building slab-on-grade areas or exterior concrete flatwork areas unless the soils are compacted to at least 90 percent of maximum dry density.**

10.2.5 Foundation Setbacks

Footings of structures (including retaining walls) located above a slope having a total height of 10 feet or less should have a minimum setback of 5 feet, measured from the outside edge of the footing bottom along a horizontal line to the face of the slope. For footings above slopes having a total height greater than 10 feet, the setback should be, at minimum, equal to one third of the total height of the slope but need not exceed 40 feet. Refer to the IBC Table 1805.3.1.

10.3 RETAINING WALLS AND WALLS BELOW GRADE

The project may include shallow retaining walls or walls below grade supporting soil materials. These walls are anticipated to be shallow (i.e., approximately 10 feet or less in height). Design lateral earth pressures, backfill criteria, and drainage recommendations for walls below grade are presented.

10.3.1 Lateral Earth Pressures

	*	Driving Earth Pressure*	Resisting Earth Pressure*
Equivalent fluid pressure (PSF) per foot of soil height	Well-drained soil	40	275**
	Well-drained soil (2:1 backfill)	63	
	At-rest (restrained wall)	60^	

^For design purposes, a wall is considered restrained if it prevented from movement greater than 0.002H (H= height of wall in feet) at the top of the wall.

**The upper one foot of soil should be subtracted from the depth Z, unless confined by pavement or slab. This is an ultimate value.

Note: The pressures recommended above are based on the assumption that the backfill will be compacted to 90% relative compaction.

Friction acting along the base of the foundation may provide resistance to lateral loading. The coefficient of friction is estimated to be 0.27 for native soils compacted to 90% relative compaction, and may be used with dead loads. This value may be increase by 1/3 for total loads, including seismic forces. Frictional and passive resistance may be combined without reduction.

The above values are for retaining walls that have been supplied with a proper subdrain system. All walls should be designed to support any adjacent structural surcharge loads imposed by other nearby walls or footings in addition to the above recommended active and at-rest earth pressures.

10.3.2 Wall Backfill

Backfill behind shallow retaining walls or walls below grade should consist of non-expansive granular materials. Wall backfill should not contain organic material, rubble, debris, and rocks or cemented fragments larger than 3 inches in greatest dimension. In the case where no shoring was used, the granular backfill should extend outward from the base of the wall to ground surface at a 1:1 (horizontal: vertical) slope.

Backfill should be placed in lifts not exceeding 8 inches in thickness measured loose, moisture conditioned to above optimum moisture content and mechanically compacted with hand-operated equipment to minimum 90 percent of the maximum dry density as determined by ASTM D 1557. Walls below grade that are not free to deflect should be properly braced prior to placement and compaction of backfill.

10.3.3 Drainage and Waterproofing

Walls designed for drained earth pressures shall have adequate drainage provided behind the walls. Subdrains at the base of the walls shall be incorporated into design. Wall backdrains shall be designed by a registered Civil Engineer

11.0 CORROSION AND CHEMICAL ATTACK

Soluble sulfate, pH, resistivity and chloride concentration test results are presented in Appendix B. The Resistivity (CTM 643) test results on a bulk soil sample from the site indicated that on-site soils are not corrosive when in contact with ferrous material (10,500 ohm-cm).

Corrosion test results also indicate that the surficial soils at the site have negligible sulfate attack potential (123 ppm) on concrete, according to the ACI 318 Table 4.3.1. Type II cement should be used in all concrete that may be in contact with the on-site soils. The minimum concrete compressive strength should be determined by the structural engineer.

Chemical test results performed on a bulk soil sample obtained during the field investigation are presented in Appendix C.

12.0 UTILITY TRENCH BACKFILL

The attention of contractors, particularly the underground contractors, should be drawn to the State of California Construction Safety Orders for “Excavations, Trenches, and

Earthwork." Trenches or excavations greater than five (5) feet in depth should be shored or sloped back in accordance with OSHA Regulations prior to entry.

Soil backfill around foundations or behind walls below grade should be placed in lifts not exceeding eight (8) inches measured loose, moisture conditioned to near optimum moisture content and mechanically compacted to 90% relative compaction as determined by ASTM D 1557 test method. No flooding or jetting will be allowed.

Trench backfill shall be moisture conditioned to near optimum moisture content, placed in lifts not exceeding eight (8) inches measured loose, and mechanically compacted to 90% relative compaction as determined by ASTM D 1557 test method. **No flooding or jetting will be allowed**

Backfill of public utilities within road right-of-ways or on the subject site should be placed in strict conformance with the requirements of the governing agency.

For purposes of this section of the report, "bedding" is defined as material placed in a trench up to one (1) foot above a utility pipe, and "backfill" is all material placed in the trench above the bedding. Unless concrete bedding is required around utility pipes, free-draining sand should be used as bedding. Sand proposed for use as bedding should be tested in our laboratory to verify its suitability and measure its compaction characteristics. **Sand bedding should be compacted by mechanical means to achieve at least 90% relative compaction based on ASTM D 1557.**

Backfill operations should be observed and tested by the Geotechnical Consultant to monitor compliance with these recommendations.

All utility trench backfill should be compacted to a minimum relative compaction of 90 percent. Trench backfill materials should be placed in lifts no greater than approximately 8 inches in thickness measured loose, watered or air-dried as necessary to achieve near optimum moisture conditions, and then mechanically compacted in place to a minimum relative compaction of 90 percent. A representative of the project geotechnical consultant should probe and test the backfills to verify adequate compaction.

Where utility trenches enter the footprint of the building, they should be backfilled through their entire depths with on-site fill materials, sand-cement slurry, or concrete rather than with any sand or gravel shading. This "Plug" of less- or non-permeable materials will mitigate the potential for water to migrate though the backfilled trenches from outside of the building to the areas beneath the foundations and floor slabs.

13.0 INTERIOR CONCRETE SLAB-ON-GRADE

13.1 Moisture Barrier

Slab-on-grade shall be underlain by a 10 mil. vapor barrier. The vapor barrier shall be lapped a minimum of three feet and all laps shall be sealed. Two (2) inches of clean sand shall be placed over the vapor barrier for protection and to aid in curing the concrete. The sand shall be moistened prior to concrete placement.

13.2 Thickness and Joint Spacing

Concrete slab-on-grade should be at least 4 inches thick and provided with construction joints or expansion joints every 10 feet or less. The slab-on-grade should have a minimum compressive strength of 2,500 psi at 28 days.

13.3 Reinforcement

Reinforcement should be provided with No. 3 bars spaced 18 inches on centers, both ways. The reinforcement should be positioned near the middle of the slabs by means of concrete chairs or brick.

13.4 Subgrade Preparation

As further measure to minimize cracking of concrete flatwork, the subgrade soils below concrete flatwork areas should first be compacted to a minimum relative compaction of **90 percent** and then thoroughly moistened to achieve a moisture content that is near optimum moisture content. **A representative of the project geotechnical consultant should observe and verify the density and moisture content of the soils, and the depth or moisture penetration prior to pouring concrete.**

14.0 EXTERIOR CONCRETE FLATWORK

14.1 Thickness and Joint Spacing

To reduce the potential of unsightly cracking, concrete sidewalks, patio-type slabs should be at least 4 inches thick and provided with construction joints or expansion joints every 10 feet or less. The slab-on-grade in heavy traffic areas (garbage trucks, etc.) should be a minimum of five (5) inches thick and have a minimum compressive strength of 3,500 psi at 28 days.

14.2 Reinforcement

Consideration should be given to reinforcing all concrete patio-type slabs and sidewalks greater than 5 feet in width with No. 3 bars spaced 18 inches on centers, both ways. The reinforcement should be positioned near the middle of the slabs by means of concrete chairs or brick.

14.3 Subgrade Preparation

As further measure to minimize cracking of concrete flatwork, the subgrade soils below concrete flatwork areas should first be compacted to a minimum relative compaction of 90 percent (**95 percent in traffic areas)** and then thoroughly moistened to achieve a moisture content that is near optimum moisture content. Pre-wetting of the soils will promote uniform curing of the concrete and minimize the development of shrinkage cracks. **A representative of the project geotechnical consultant should observe and verify the density and moisture content of the soils, and the depth or moisture penetration prior to pouring concrete.**

15.0 PRELIMINARY FLEXIBLE PAVEMENT DESIGN

Asphalt concrete pavements shall be designed per the Caltrans Highway Design Manual based on R-Value and Traffic Index. An assumed R-value of the native soil of 35 was utilized for the preliminary structural pavement section. During grading as soils are mixed, soil samples should be tested for R-Value determination.

For pavement design, the preliminary flexible pavement layer thickness is as follows:

RECOMMENDED ASPHALT PAVEMENT SECTION LAYER THICKNESS

Pavement Material	Recommended Thickness (TI = 6.0)
Asphalt Concrete	4”
Class II Aggregate Base	8”
Compacted Subgrade Soils	18”

Asphalt concrete should conform to Sections 203 and 302 of the latest edition of the Standard Specifications for Public Works Construction (“Greenbook”).

Class II aggregate base should conform to Section 26 of the Caltrans Standard Specifications, latest edition. The aggregate base should be compacted to at least 95 percent of the maximum dry density as determined by ASTM Method D 1557.

16.0 CONSTRUCTION CONSIDERATIONS

Based on our field exploration program, earthwork can be performed with conventional construction equipment.

16.1 Temporary Dewatering

Groundwater was not encountered in any of our borings to the maximum depth of our explorations. Based on the anticipated excavation depths, the need for temporary dewatering is considered low.

16.2 Construction Slopes

Excavations during construction should be conducted so that slope failure and excessive ground movement will not occur. The short-term stability of excavation depends on many factors, including slope angle, engineering characteristics of the subsoils, height of the excavation and length of time the excavation remains unsupported and exposed to equipment vibrations, rainfall and desiccation.

Where spacing permits, and providing that adjacent facilities are adequately supported, open excavations may be considered. In general, unsupported slopes for temporary construction excavations should not be expected to stand at an inclination steeper than 1:1 (horizontal: vertical). The temporary excavation side walls may be cut vertically to a height of 3 feet and then laid back at a 1:1 slope ratio above a height of 3 feet.

Surcharge loads should be kept away from the top of temporary excavations a horizontal distance equal to at least one-half the depth of excavation. Surface drainage should be controlled along the top of temporary excavations to preclude wetting of the soils and erosion of the excavation faces. Even with the implementation of the above recommendations, sloughing of the surface of the temporary excavations may still occur, and workmen should be adequately protected from such sloughing.

16.3 Temporary Shoring

If shoring is considered, Bruin GSI should be notified in order to provide appropriate design parameters.

17.0 ADDITIONAL SERVICES

Final project plans and specifications should be reviewed prior to construction to confirm that the full intent of the recommendations presented herein have been applied to design and construction. This report is based on the assumption that an adequate testing and inspection program along with client consultation will be performed during final design and construction phases to verify compliance with the recommendations of this report.

Retaining Bruin GSI as the geotechnical consultant to provide additional services from preliminary design through project completion will assure continuity of services.

Additional services include:

- Consultation during design stages of the project.
- Review, stamp and signature of the grading and building plans.
- Observation and testing during rough grading, fine grading and trench backfill as well as placement of engineered fill.
- Consultation as required during construction.

Cost estimates can be prepared if requested. Please contact our office.

18.0 LIMITATIONS AND UNIFORMITY OF CONDITIONS

This report is based on the development plans provided to our office. If structure design changes or structure locations changes occur, the conclusion and recommendations in this report may not be considered valid unless the changes are reviewed and the conclusions of this report are modified or approved by the Geotechnical Consultant.

The subsurface conditions and characteristics described herein have been projected from individual borings or test pits placed across the subject property. Actual variations in the subsurface conditions and characteristics may occur.

If conditions encountered during construction differ from those described in this report, this office should be notified so as to consider the necessity for modifications. No responsibility for construction compliance with the design concepts, specifications, or recommendations is assumed unless on-site construction review is performed during the course of construction, which pertains to the specific recommendations contained herein.

It is recommended that Bruin GSI be provided the opportunity for a general review of final design and specifications in order that earthwork and foundation recommendations may be properly interpreted and implemented in the design specifications. If Bruin GSI is not accorded the privilege of making this recommended review, Bruin GSI can assume no responsibility for misinterpretation of the recommendations contained in this report.

This report has been prepared in accordance with generally accepted practice and standards in this community at this time. No warranties, either expressed or implied, are made as to the professional advice provided under the terms of the agreement and included in this report. This report has been prepared for the exclusive use of Gage Palmdale, LLC and their authorized agents. Unauthorized reproduction of any portion of this report without expressed written permission is prohibited.

If parties other than Bruin GSI are engaged to provide construction geotechnical services, they must be notified that they will be required to assume complete responsibility for the geotechnical phase of the project by concurring with the findings and recommendations in this report or providing alternate recommendations.

19.0 CLOSURE

The conclusions, recommendations, and opinions presented herein are: (1) based upon our evaluation and interpretations of the limited data obtained from our field and laboratory programs; (2) based upon an interpolation of soil conditions between and beyond the borings; (3) are subject to confirmation of the actual conditions encountered during construction; and, (4) are based upon the assumption that sufficient observation and testing will be provided during the grading, infrastructure installation and building phases of site development.

APPENDIX A

Boring Logs and Classification Key

Project: **Cage Development** Project Location: **20th St. West & Ave. P** Project Number: **17-113**	**Bruin Geotechnical Services** 44732 Yucca Avenue Lancaster, CA 93534 (661) 273-9078	Log of Boring 1 **Sheet 1 of 1**

Date(s) Drilled **9/22/17 & 10/20/17**	Logged By **DBM**	Checked By **MS**
Drilling Method **Hollow Stem Auger**	Drill Bit Size/Type **8"**	Total Depth of Borehole **16"**
Drill Rig Type **CME 75**	Drilling Contractor **GP Drilling**	Approximate Surface Elevation **2,701**
Groundwater Level and Date Measured **No Groundwater**	Sampling Method(s) **SPT**	Hammer Data **140# 30" drop**
Borehole Backfill **Native/ Cuttings**	Location **Lat: 34.6050 Long: -118.1650**	

Depth (feet)	Sample Type	USCS	Graphic Log	MATERIAL DESCRIPTION	Sampling Resistance, blows/ft	Dry Unit Weight, pcf	Water Content, %	REMARKS AND OTHER TESTS
0		SM						
		SM		Moderate brown silty fine to medium sand w/ coarse sand & occ. #4-1/2" gravel. Med.dense, moist	10-22-47		6.4	
5		SM		Yellowish brown silty fine to medium sand w/ coarse sand & occ. #4 gravel (Cemented). Med.dense, moist	20-50/6"		6.4	
		SM		Light yellowish brown silty fine to medium sand w/ occ. coarse sand-#4 gravel. Med.dense, moist	12-15-18		2.0	
10		SP-SM		Yellowish brown slightly silty fine to coarse sand w/ occ. #4-1/2" gravel. Med.dense, moist	10-15-18		2.1	
15		SM		Yellowish brown slightly silty fine to coarse sand w/ #4 gravel & occ. 3/8" gravel. Loose, moist	10-15-17		2.2	
20								
25								
30								

Project: **Cage Development** Project Location: **20th St. West & Ave. P** Project Number: **17-113**	**Bruin Geotechnical Services** 44732 Yucca Avenue Lancaster, CA 93534 (661) 273-9078	Log of Boring 2 **Sheet 1 of 1**

Date(s) Drilled **9/22/17 & 10/20/17**	Logged By **DBM**	Checked By **MS**
Drilling Method **Hollow Stem Auger**	Drill Bit Size/Type **8"**	Total Depth of Borehole **11"**
Drill Rig Type **CME 75**	Drilling Contractor **GP Drilling**	Approximate Surface Elevation **2,702**
Groundwater Level and Date Measured **No Groundwater**	Sampling Method(s) **Modified California**	Hammer Data **140# 30" drop**
Borehole Backfill **Native/ Cuttings**	Location **Lat: 34.6038 Long: -118.1650**	

Depth (feet)	Sample Type	USCS	Graphic Log	MATERIAL DESCRIPTION	Sampling Resistance, blows/ft	Dry Unit Weight, pcf	Water Content, %	REMARKS AND OTHER TESTS
0		SM						
3	■	SM		Yellowish brown very silty fine to medium sand w/ coarse sand (Cemented). Dense, moist	35-50/5"	131.8	4.0	
5	■	SM		Yellowish brown very silty fine to medium sand w/ coarse sand & occ. #4-1/2" gravel (Cemented). Dense, moist	50/6"	114.0	5.9	
8	■	SM		Yellowish brown silty fine to coarse sand w/ #4 gravel (Cemented). Very dense, moist	50/5"	121.9	5.5	
10	■	SM		Yellowish rown silty fine to coarse sand w/ #4 gravel & occ. 3/8" gravel (Cemented). Very dense, moist	50/6"	101.3	5.7	
15								
20								
25								
30								

Project: **Cage Development** Project Location: **20th St. West & Ave. P** Project Number: **17-113**	**Bruin Geotechnical Services** 44732 Yucca Avenue Lancaster, CA 93534 (661) 273-9078	Log of Boring 3 **Sheet 1 of 2**

Date(s) Drilled **9/22/17 & 10/20/17**	Logged By **DBM**	Checked By **MS**
Drilling Method **Hollow Stem Auger**	Drill Bit Size/Type **8"**	Total Depth of Borehole **31"**
Drill Rig Type **CME 75**	Drilling Contractor **GP Drilling**	Approximate Surface Elevation **2,701**
Groundwater Level and Date Measured **No Groundwater**	Sampling Method(s)	Hammer Data **140# 30" drop**
Borehole Backfill **Native/ Cuttings**	Location **Lat: 34.6036 Long: -118.1639**	

Depth (feet)	Sample Type	USCS	Graphic Log	MATERIAL DESCRIPTION	Sampling Resistance, blows/ft	Dry Unit Weight, pcf	Water Content, %	REMARKS AND OTHER TESTS
0		SM						
2	■	SM		Yellowish brown very silty fine to medium sand w/ coarse sand & occ. #4 gravel (Cemented). Dense, moist	32-50/6"	114.6	4.4	
5	■	SM		Yellowish brown very silty fine to medium sand w/ coarse sand & occ. #4 gravel (Cemented). Dense, moist	30-50/6"	115.1	6.9	
10	■	SP		Moderate brown fine to medium sand w/ coarse sand & occ. #4 gravel. Med.dense, moist	18-30	104.8	2.0	
15	■	SM		Moderate brown silty fine to coarse sand w/ occ. #4-3/8" gravel & clay binder. Very dense, very moist	20-50/6"	133.6	9.2	
20	■	SM		Dark yellowish brown slightly silty fine to coarse sand w/ #4 gravel, occ. 1/2" gravel & decomposing bedrock. Weathered, moist	10-18	104.0	4.1	
25								
30								

Project: **Cage Development** Project Location: **20th St. West & Ave. P** Project Number: **17-113**	**Bruin Geotechnical Services** 44732 Yucca Avenue Lancaster, CA 93534 (661) 273-9078	Log of Boring 3 **Sheet 2 of 2**

Depth (feet)	Sample Type	USCS	Graphic Log	MATERIAL DESCRIPTION	Sampling Resistance, blows/ft	Dry Unit Weight, pcf	Water Content, %	REMARKS AND OTHER TESTS
30		SM		Moderate brown silty fine to coarse sand w/ occ. #4-1/2" gravel. Med.dense, very moist	28-50/5"	127.0	7.1	
35								
40								
45								
50								
55								
60								
65								

Project: **Cage Development** Project Location: **20th St. West & Ave. P** Project Number: **17-113**	**Bruin Geotechnical Services** 44732 Yucca Avenue Lancaster, CA 93534 (661) 273-9078	Log of Boring 4 **Sheet 1 of 1**
Date(s) Drilled **9/22/17 & 10/20/17**	Logged By **DBM/AM**	Checked By **MS**
Drilling Method **Hollow Stem Auger**	Drill Bit Size/Type **8"**	Total Depth of Borehole **16"**
Drill Rig Type **CME 75**	Drilling Contractor **GP Drilling**	Approximate Surface Elevation **2,710**
Groundwater Level and Date Measured **No Groundwater**	Sampling Method(s) **SPT**	Hammer Data **140# 30" drop**
Borehole Backfill **Native/ Cuttings**	Location **Lat: 34.6025 Long: -118.1649**	

Depth (feet)	Sample Type	USCS	Graphic Log	MATERIAL DESCRIPTION	Sampling Resistance, blows/ft	Dry Unit Weight, pcf	Water Content, %	REMARKS AND OTHER TESTS
0		SM						
3		SM		Moderate brown silty fine to medium sand w/ occ. coarse sand & #4 gravel. Very dense, moist	25-50/6"		4.7	
5								
6		SM		Moderate brown silty fine to medium sand w/ occ. coarse sand. Med.dense, moist	12-15-17		8.2	
9		SM		Moderate brown slightly silty fine to medium sand w/ coarse sand & occ. #4-1/2" gravel. Med.dense, moist	15-18-18		6.1	
10								
15		SM		Moderate brown slightly silty fine t ocoarse sand w/ #4 gravel. Loose, moist	9-14-9		3.9	
20								
25								
30								

Project: **Cage Development** Project Location: **20th St. West & Ave. P** Project Number: **17-113**	**Bruin Geotechnical Services** 44732 Yucca Avenue Lancaster, CA 93534 (661) 273-9078	Log of Boring 5 **Sheet 1 of 1**

Date(s) Drilled **9/22/17 & 10/20/17**	Logged By **DBM/AM**	Checked By **MS**
Drilling Method **Hollow Stem Auger**	Drill Bit Size/Type **8"**	Total Depth of Borehole **21"**
Drill Rig Type **CME 75**	Drilling Contractor **GP Drilling**	Approximate Surface Elevation **2,710**
Groundwater Level and Date Measured **No Groundwater**	Sampling Method(s) **Modified California**	Hammer Data **140# 30" drop**
Borehole Backfill **Native/ Cuttings**	Location **Lat: 34.6021 Long: -118.1636**	

Depth (feet)	Sample Type	USCS	Graphic Log	MATERIAL DESCRIPTION	Sampling Resistance, blows/ft	Dry Unit Weight, pcf	Water Content, %	REMARKS AND OTHER TESTS
0		SM						
	■	SM		Light brown very silty fine to medium sand w/ occ. coarse sand w/ #4 gravel. Loose, dry	10-17	107.2	1.9	
5	■	SM		Moderate brown silty fine to medium sand w/ coarse sand & occ. #4 gravel. Med.dense, moist	17-22	111.2	3.9	
	■	SP		Yellowish brown fine to medium sand w/ coarse sand & occ. #4-3/8" gravel. Dense, moist	10-13	110.3	2.0	
10	■	SP		Moderate brown fine to coarse sand w/ #4-1/2" gravel. Dense, moist	9-13	108.9	1.7	
15	■	SP		Moderate brown fine to coarse sand w/ #4-1/2" gravel. Dense, moist	9-15	109.0	2.4	
20	■	SM		Reddish brown slightly silty fine to coarse sand w/ occ. #4-1/2" gravel. Med.dense, moist	24-29	115.4	4.9	
25								
30								

Project: **Cage Development** Project Location: **20th St. West & Ave. P** Project Number: **17-113**	**Bruin Geotechnical Services** 44732 Yucca Avenue Lancaster, CA 93534 (661) 273-9078	Log of Boring 6 **Sheet 1 of 1**

Date(s) Drilled **9/22/17 & 10/20/17**	Logged By **DBM/AM**	Checked By **MS**
Drilling Method **Hollow Stem Auger**	Drill Bit Size/Type **8"**	Total Depth of Borehole **16"**
Drill Rig Type **CME 75**	Drilling Contractor **GP Drilling**	Approximate Surface Elevation **2,709**
Groundwater Level and Date Measured **No Groundwater**	Sampling Method(s) **Bulk, SPT**	Hammer Data **140# 30" drop**
Borehole Backfill **Native/ Cuttings**	Location **Lat: 34.6021 Long: -118.1622**	

Depth (feet)	Sample Type	USCS	Graphic Log	MATERIAL DESCRIPTION	Sampling Resistance, blows/ft	Dry Unit Weight, pcf	Water Content, %	REMARKS AND OTHER TESTS
0		SM						
		SM		Moderate brown silty fine sand w/ medium to coarse sand & occ. #4-1/2" gravel. Dense, dry	11-12-15		2.1	
5		SM		Moderate brown silty fine to medium sand w/ coarse sand & occ. #4 gravel. Dense, moist	10-15-10		2.7	
10		SM-ML		Dark yellowish brown very silty fine to medium sand w/ occ. coarse sand & #4 gravel. Loose, very moist	7-8-8		11.6	
15		SM		Moderate brown silty fine to medium sand w/ occ. coarse sand-1/2" gravel. Loose, moist	5-8-12		4.4	
20								
25								
30								

Project: **Cage Development** Project Location: **20th St. West & Ave. P** Project Number: **17-113**	**Bruin Geotechnical Services** 44732 Yucca Avenue Lancaster, CA 93534 (661) 273-9078	Log of Boring 7 **Sheet 1 of 1**

Date(s) Drilled **9/22/17 & 10/20/17**	Logged By **DBM/AM**	Checked By **MS**
Drilling Method **Hollow Stem Auger**	Drill Bit Size/Type **8"**	Total Depth of Borehole **11"**
Drill Rig Type **CME 75**	Drilling Contractor **GP Drilling**	Approximate Surface Elevation **2,705**
Groundwater Level and Date Measured **No Groundwater**	Sampling Method(s) **Modified California**	Hammer Data **140# 30" drop**
Borehole Backfill **Native/ Cuttings**	Location **Lat: 34.6021 Long: -118.1615**	

Depth (feet)	Sample Type	USCS	Graphic Log	MATERIAL DESCRIPTION	Sampling Resistance, blows/ft	Dry Unit Weight, pcf	Water Content, %	REMARKS AND OTHER TESTS
0		SM						
		SM		Light brown very silty fine to medium sand w/ coarse sand. Loose, dry	10-16	107.2	1.6	
5		SM		Moderate brown silty fine to medium sand w/ occ. coarse sand & #4 gravel. Very dense, dry	50/6"	108.6	2.9	
		SM		Moderate brown silty fine to coarse sand w/ #4 gravel. Dense, moist	8-16	110.6	2.5	
10		SM		Moderate brown silty fine to coarse sand w/ occ. #4 gravel (Slightly Cemented). Dense, moist	17-19	109.3	3.5	
15								
20								
25								
30								

Project: **Cage Development** Project Location: **20th St. West & Ave. P** Project Number: **17-113**	**Bruin Geotechnical Services** 44732 Yucca Avenue Lancaster, CA 93534 (661) 273-9078	Log of Boring 8 **Sheet 1 of 1**

Date(s) Drilled **9/22/17 & 10/20/17**	Logged By **DBM/AM**	Checked By **MS**
Drilling Method **Hollow Stem Auger**	Drill Bit Size/Type **8"**	Total Depth of Borehole **16"**
Drill Rig Type **CME 75**	Drilling Contractor **GP Drilling**	Approximate Surface Elevation **2,705**
Groundwater Level and Date Measured **No Groundwater**	Sampling Method(s) **SPT**	Hammer Data **140# 30" drop**
Borehole Backfill **Native/ Cuttings**	Location **Lat: 34.6030 Long: -118.1614**	

Depth (feet)	Sample Type	USCS	Graphic Log	MATERIAL DESCRIPTION	Sampling Resistance, blows/ft	Dry Unit Weight, pcf	Water Content, %	REMARKS AND OTHER TESTS
0		SM						
3		SM		Yellowish brown silty fine to medium sand w/ coarse sand & occ. #4 gravel. Med.dense, moist	5-7-9		2.5	
6		SM		Yellowish brown silty fine to medium sand w/ coarse sand & occ. #4 gravel. Med.dense, moist	5-6-11		2.3	
9		SM-ML		Yellowish brown very silty fine sand w/ medium sand & occ. #4 gravel. Very dense, very moist	18-40-37		10.3	
12		SM		Moderate brown slightly silty fine to medium sand w/ occ. coarse sand & #4 gravel. Loose, moist	8-10-10		4.1	
15		SM		Moderate brown slightly silty fine to medium sand. Med.dense, moist	8-10-13		4.2	

Depth scale: 0, 5, 10, 15, 20, 25, 30

Project: **Cage Development** Project Location: **20th St. West & Ave. P** Project Number: **17-113**	**Bruin Geotechnical Services** 44732 Yucca Avenue Lancaster, CA 93534 (661) 273-9078	Log of Boring 9 **Sheet 1 of 1**

Date(s) Drilled **9/22/17 & 10/20/17**	Logged By **DBM/AM**	Checked By **MS**
Drilling Method **Hollow Stem Auger**	Drill Bit Size/Type **8"**	Total Depth of Borehole **21"**
Drill Rig Type **CME 75**	Drilling Contractor **GP Drilling**	Approximate Surface Elevation **2,705**
Groundwater Level and Date Measured **No Groundwater**	Sampling Method(s) **Modified California**	Hammer Data **140# 30" drop**
Borehole Backfill **Native/ Cuttings**	Location **Lat: 34.6033 Long: -118.1624**	

Depth (feet)	Sample Type	USCS	Graphic Log	MATERIAL DESCRIPTION	Sampling Resistance, blows/ft	Dry Unit Weight, pcf	Water Content, %	REMARKS AND OTHER TESTS
0		SM						
3	■	SM		Moderate brown silty fine to medium sand w/ coarse sand & occ. #4 gravel. Med.dense, moist	5-17	104.7	2.1	
6	■	SM		Moderate brown silty fine to medium sand w/ coarse sand & occ. #4 gravel. Med.dense, moist	13-17	116.8	2.5	
10	■	SP-SM		Moderate brown slightly silty fine to coarse sand w/ occ. #4-3/8" gravel. Med.dense, moist	12-11	108.4	2.3	
15	■	SM		Moderate brown silty fine to coarse sand w/ occ. #4 gravel (Slightly Cemented). Very dense, moist	24-50/5"	110.5	4.1	
20	■	SM		Reddish brown slightly silty fine to coarse sand w/ #4-3/8" gravel & occ. 1/2" gravel. Med.dense, moist	23-31	114.5	4.0	

Depth scale: 0, 5, 10, 15, 20, 25, 30

Project: **Cage Development** Project Location: **20th St. West & Ave. P** Project Number: **17-113**	**Bruin Geotechnical Services** 44732 Yucca Avenue Lancaster, CA 93534 (661) 273-9078	Log of Boring 10 **Sheet 1 of 1**

Date(s) Drilled **9/22/17 & 10/20/17**	Logged By **DBM/AM**	Checked By **MS**
Drilling Method **Hollow Stem Auger**	Drill Bit Size/Type **8"**	Total Depth of Borehole **11"**
Drill Rig Type **CME 75**	Drilling Contractor **GP Drilling**	Approximate Surface Elevation **2,703**
Groundwater Level and Date Measured **No Groundwater**	Sampling Method(s) **SPT**	Hammer Data **140# 30" drop**
Borehole Backfill **Native/ Cuttings**	Location **Lat: 34.6042 Long: -118.1619**	

Depth (feet)	Sample Type	USCS	Graphic Log	MATERIAL DESCRIPTION	Sampling Resistance, blows/ft	Dry Unit Weight, pcf	Water Content, %	REMARKS AND OTHER TESTS
0		SM						
		SM		Moderate brown silty fine to coarse sand w/ occ. #4 gravel. Med.dense, moist	6-8-10		2.5	
5		SM		Moderate brown silty fine to coarse sand w/ occ. #4 gravel. Med.dense, moist	10-12-11		2.5	
		SM		Moderate brown silty fine to coarse sand w/ #4 gravel & occ. 1/2" gravel. Med.dense, moist	7-6-6		2.8	
10		SM		Moderate brown silty fine to coarse sand w/ #4 gravel & occ. 1/2" gravel. Med.dense, moist	6-6-7		3.0	
15								
20								
25								
30								

Project: **Cage Development** Project Location: **20th St. West & Ave. P** Project Number: **17-113**	**Bruin Geotechnical Services** 44732 Yucca Avenue Lancaster, CA 93534 (661) 273-9078	Log of Boring 11 **Sheet 1 of 1**

Date(s) Drilled **9/22/17 & 10/20/17**	Logged By **DBM/AM**	Checked By **MS**
Drilling Method **Hollow Stem Auger**	Drill Bit Size/Type **8"**	Total Depth of Borehole **16"**
Drill Rig Type **CME 75**	Drilling Contractor **GP Drilling**	Approximate Surface Elevation **2,700**
Groundwater Level and Date Measured **No Groundwater**	Sampling Method(s) **Modified California**	Hammer Data **140# 30" drop**
Borehole Backfill **Native/ Cuttings**	Location **Lat: 34.6046 Long: -118.1612**	

Depth (feet)	Sample Type	USCS	Graphic Log	MATERIAL DESCRIPTION	Sampling Resistance, blows/ft	Dry Unit Weight, pcf	Water Content, %	REMARKS AND OTHER TESTS
0		SM						
	■	SM		Moderate borwn silty fine to medium sand w/ coarse sand & occ. #4 gravel. Med.dense, dry	20-26	111.3	1.7	
5	■	SM		Moderate borwn silty fine to medium sand w/ coarse sand & occ. #4-1/2" gravel. Med.dense, dry	30-37	117.6	2.9	
	■	SM		Moderate borwn fine to medium sand w/ coarse sand. Med.dense, moist	18-19	109.2	3.0	
10	■	SM		Yellowish brown slightly silty fine to coarse sand w/ #4-1/2" gravel. Loose, moist	14-17	113.0	3.9	
15	■	SM		Moderate brown silty fine to medium sand w/ coarse sand & occ. #4-3/8" gravel. Med.dense, moist	13-15	118.1	6.3	
20								
25								
30								

Project: **Cage Development** Project Location: **20th St. West & Ave. P** Project Number: **17-113**	**Bruin Geotechnical Services** 44732 Yucca Avenue Lancaster, CA 93534 (661) 273-9078	Log of Boring 12 **Sheet 1 of 1**
Date(s) Drilled **9/22/17 & 10/20/17**	Logged By **DBM/AM**	Checked By **MS**
Drilling Method **Hollow Stem Auger**	Drill Bit Size/Type **8"**	Total Depth of Borehole **16"**
Drill Rig Type **CME 75**	Drilling Contractor **GP Drilling**	Approximate Surface Elevation **2,700**
Groundwater Level and Date Measured **No Groundwater**	Sampling Method(s) **Bulk**	Hammer Data **140# 30" drop**
Borehole Backfill **Native/ Cuttings**	Location **Lat: 34.6051 Long: -118.1619**	

Depth (feet)	Sample Type	USCS	Graphic Log	MATERIAL DESCRIPTION	Sampling Resistance, blows/ft	Dry Unit Weight, pcf	Water Content, %	REMARKS AND OTHER TESTS
0		SM						
		SM		Yellowish brown silty fine to medium sand w/ coarse sand & occ. #4 gravel. Med.dense, dry	6-11-10		1.2	
		SM		Moderate brown silty fine to medium sand w/ coarse sand & occ. #4 gravel. Med.dense, moist	7-7-10		3.6	
5								
		SM		Moderate brown silty fine to medium sand w/ coarse sand & occ. #4 gravel. Med.dense, moist	6-7-8		2.6	
10		SM		Moderate brown silty fine to medium sand w/ coarse sand & occ. #4 gravel. Med.dense, moist	8-7-7		2.2	
15		SM		Moderate brown silty fine to medium sand w/ occ. coarse sand & 1/2" gravel. Med.dense, moist	16-20-20		6.0	
20								
25								
30								

Project: **Cage Development** Project Location: **20th St. West & Ave. P** Project Number: **17-113**	**Bruin Geotechnical Services** 44732 Yucca Avenue Lancaster, CA 93534 (661) 273-9078	Log of Boring 13 **Sheet 1 of 1**

Date(s) Drilled **9/22/17 & 10/20/17**	Logged By **DBM/AM**	Checked By **MS**
Drilling Method **Hollow Stem Auger**	Drill Bit Size/Type **8"**	Total Depth of Borehole **11"**
Drill Rig Type **CME 75**	Drilling Contractor **GP Drilling**	Approximate Surface Elevation **2,694**
Groundwater Level and Date Measured **No Groundwater**	Sampling Method(s) **SPT**	Hammer Data **140# 30" drop**
Borehole Backfill **Native/ Cuttings**	Location **Lat: 34.6051 Long: -118.1636**	

Depth (feet)	Sample Type	USCS	Graphic Log	MATERIAL DESCRIPTION	Sampling Resistance, blows/ft	Dry Unit Weight, pcf	Water Content, %	REMARKS AND OTHER TESTS
0		SM						
		SM		Yellowish brown fine to coarse sand w/ occ. #4 gravel. Med.dense, moist	7-7-10		2.7	
5		SM		Yellowish brown fine to coarse sand w/ occ. #4 gravel. Med.dense, moist	10-17-27		3.3	
		SM		Moderate brown silty fine to coarse sand w/ #4-1/2" gravel. Med.dense, moist	13-15-26		4.1	
10		SM		Moderate brown slightly silty fine to coarse sand w/ occ. #4-1/2" gravel. Med.dense, moist	16-22-28		3.6	
15								
20								
25								
30								

Project: **Cage Development** Project Location: **20th St. West & Ave. P** Project Number: **17-113**	**Bruin Geotechnical Services** 44732 Yucca Avenue Lancaster, CA 93534 (661) 273-9078	Log of Boring 14 **Sheet 1 of 1**

Date(s) Drilled **9/22/17 & 10/20/17**	Logged By **DBM/AM**	Checked By **MS**
Drilling Method **Hollow Stem Auger**	Drill Bit Size/Type **8"**	Total Depth of Borehole **21"**
Drill Rig Type **CME 75**	Drilling Contractor **GP Drilling**	Approximate Surface Elevation **2,700**
Groundwater Level and Date Measured **No Groundwater**	Sampling Method(s) **SPT**	Hammer Data **140# 30" drop**
Borehole Backfill **Native/ Cuttings**	Location **Lat: 34.6042 Long: -118.1642**	

Depth (feet)	Sample Type	USCS	Graphic Log	MATERIAL DESCRIPTION	Sampling Resistance, blows/ft	Dry Unit Weight, pcf	Water Content, %	REMARKS AND OTHER TESTS
0		SM		Moderate brown very silty fine to medium sand w/ coarse sand & occ. #4 gravel. Loose, moist				
5		SM		Moderate brown very silty fine to medium sand w/ coarse sand & occ. #4 gravel. Med.dense, moist	5-8-13		3.4	
10		SM		Yellowish brown silty fine to coarse sand w/ #4-3/8" gravel & occ. 1" gravel. Med.dense, moist	10-12-20		3.8	
15		SM		Yellowish brown slightly silty fine to coarse sand w/ #4-1/2" gravel & occ. 1" gravel. Med.dense, moist	8-14-18		5.5	
20		SM		Yellowish brown slightly silty fine to coarse sand w/ #4-1/2" gravel, occ. 1" gravel, & clay binder. Med.dense, very moist	5-9-12		8.9	
25								
30								

Project: **Cage Development** Project Location: **20th St. West & Ave. P** Project Number: **17-113**	**Bruin Geotechnical Services** 44732 Yucca Avenue Lancaster, CA 93534 (661) 273-9078	Log of Boring 15 **Sheet 1 of 1**

Date(s) Drilled **9/22/17 & 10/20/17**	Logged By **DBM/AM**	Checked By **MS**
Drilling Method **Hollow Stem Auger**	Drill Bit Size/Type **8"**	Total Depth of Borehole **21"**
Drill Rig Type **CME 75**	Drilling Contractor **GP Drilling**	Approximate Surface Elevation **2,700**
Groundwater Level and Date Measured **No Groundwater**	Sampling Method(s) **Modified California**	Hammer Data **140# 30" drop**
Borehole Backfill **Native/ Cuttings**	Location **Lat: 34.6038 Long: -118.1638**	

Depth (feet)	Sample Type	USCS	Graphic Log	MATERIAL DESCRIPTION	Sampling Resistance, blows/ft	Dry Unit Weight, pcf	Water Content, %	REMARKS AND OTHER TESTS
0		SM						
		SM		Yellowish brown slity fine to coarse sand w/ occ. #4-1/2" gravel. Med.dense, moist	14-18	107.7	3.1	
5		SM		Moderate brown silty fine to coarse sand w/ #4-1/2" gravel & occ. 1" gravel. Med.dense, moist	24-34	117.8	5.5	
10		SM		Moderate brown silty fine to coarse sand w/ #4-1/2" gravel & occ. 1" gravel. Med.dense, moist	25-36	119.3	4.7	
15		SM		Yellowish brown silty fine to coarse sand w/ occ. #4-1/2" gravel & clay binder. Med.dense, moist	21-31	110.4	7.1	
20		SM		Yellowish brown silty fine to coarse sand w/ occ. #4-1/2" gravel & clay binder. Med.dense, moist	30-42	107.1	3.4	
25								
30								

Project: **Cage Development** Project Location: **20th St. West & Ave. P** Project Number: **17-113**	**Bruin Geotechnical Services** 44732 Yucca Avenue Lancaster, CA 93534 (661) 273-9078	Key to Log of Boring **Sheet 1 of 1**

Depth (feet)	Sample Type	USCS	Graphic Log	MATERIAL DESCRIPTION	Sampling Resistance, blows/ft	Dry Unit Weight, pcf	Water Content, %	REMARKS AND OTHER TESTS
1	2	3	4	5	6	7	8	9

COLUMN DESCRIPTIONS

1 Depth (feet): Depth in feet below the ground surface.
2 Sample Type: Type of soil sample collected at the depth interval shown.
3 USCS: USCS symbol of the subsurface material.
4 Graphic Log: Graphic depiction of the subsurface material encountered.
5 MATERIAL DESCRIPTION: Description of material encountered. May include consistency, moisture, color, and other descriptive text.
6 Sampling Resistance, blows/ft: Number of blows to advance driven sampler one foot (or distance shown) beyond seating interval using the hammer identified on the boring log.
7 Dry Unit Weight, pcf: Dry weight per unit volume of soil sample measured in laboratory, in pounds per cubic foot.
8 Water Content, %: Water content of the soil sample, expressed as percentage of dry weight of sample.
9 REMARKS AND OTHER TESTS: Comments and observations regarding drilling or sampling made by driller or field personnel.

FIELD AND LABORATORY TEST ABBREVIATIONS

CHEM: Chemical tests to assess corrosivity
COMP: Compaction test
CONS: One-dimensional consolidation test
LL: Liquid Limit, percent
PI: Plasticity Index, percent
SA: Sieve analysis (percent passing No. 200 Sieve)
UC: Unconfined compressive strength test, Qu, in ksf
WA: Wash sieve (percent passing No. 200 Sieve)

MATERIAL GRAPHIC SYMBOLS

Silty SAND (SM)

TYPICAL SAMPLER GRAPHIC SYMBOLS

Shelby Tube (Thin-walled, fixed head)
Auger sampler
Bulk Sample
3-inch-OD California w/ brass rings
CME Sampler
Grab Sample
2.5-inch-OD Modified California w/ brass liners
Pitcher Sample
2-inch-OD unlined split spoon (SPT)
Shelby Tube (Thin-walled, fixed head)

OTHER GRAPHIC SYMBOLS

Water level (at time of drilling, ATD)
Water level (after waiting)
Minor change in material properties within a stratum
Inferred/gradational contact between strata
? Queried contact between strata

GENERAL NOTES

1: Soil classifications are based on the Unified Soil Classification System. Descriptions and stratum lines are interpretive, and actual lithologic changes may be gradual. Field descriptions may have been modified to reflect results of lab tests.
2: Descriptions on these logs apply only at the specific boring locations and at the time the borings were advanced. They are not warranted to be representative of subsurface conditions at other locations or times.

APPENDIX B

Laboratory Test Data

SUMMARY OF LABORATORY TEST RESULTS

SIEVE ANALYSIS

Percent passing individual sieves

Sample I.D.	3/4"	1/2"	3/8"	#4	#10	#40	#100	#200
B1@2’	100	98	94	90	86	63	43	37
B1@7’		100	100	98	91	57	24	17
B1@10’	100	94	93	90	82	48	16	11
B2@5’	100	99	98	98	96	86	58	38
B2@10’		100	99	97	91	55	27	23
B3@2’		100	100	99	97	83	56	46
B3@15’		100	99	98	92	59	33	28
B3@30’	100	99	99	97	92	64	34	26
B4@3’		100	100	99	98	80	29	21
B4@9’	100	96	96	91	81	44	19	14
B5@5’		100	100	99	94	71	35	27
B5@8’		100	99	99	91	38	11	7
B5@15’	100	89	88	81	71	37	8	5
B6@5’	100	99	99	95	87	58	32	25
B6@15’	100	99	99	98	95	70	32	24
B7@5’		100	100	99	97	75	51	36
B8@6’		100	100	98	87	34	27	22
B8@12’		100	100	99	99	75	23	14
B9@3’		100	100	98	91	63	33	23
B9@10’		100	99	96	83	31	14	11
B10@4’		100	100	98	87	54	27	20
B10@7’		100	99	94	81	40	16	12
B11@4’	100	99	99	96	87	58	29	21
B11@15’		100	99	98	92	63	33	25
B12@4’	100	99	99	96	86	54	28	21
B12@15’	100	99	98	95	88	66	37	32
B13@10’		100	99	96	80	36	17	11
B14@5’	100	99	98	94	84	48	36	24
B14@20’	100	98	97	93	86	65	42	36

B15@6’	99	98	96	92	73	55	31	15

SAND EQUIVALENT

Sample I.D.	Sand Equivalent
B1 @ 4’	15
B1 @ 15’	40
B2@8’	15
B3@5’	8
B3@20’	57
B4@6’	11
B5@2’	25
B5@10’	79
B7@2’	19
B7@7’	48
B8@9’	0.8
B9@6’	54
B10@2’	19
B10@10’	27
B11@7’	26
B12@8’	54
B13@5’	36
B14@10’	47
B14@20’	18
B15@9’	27

Bruin Geotechncial Services Inc.

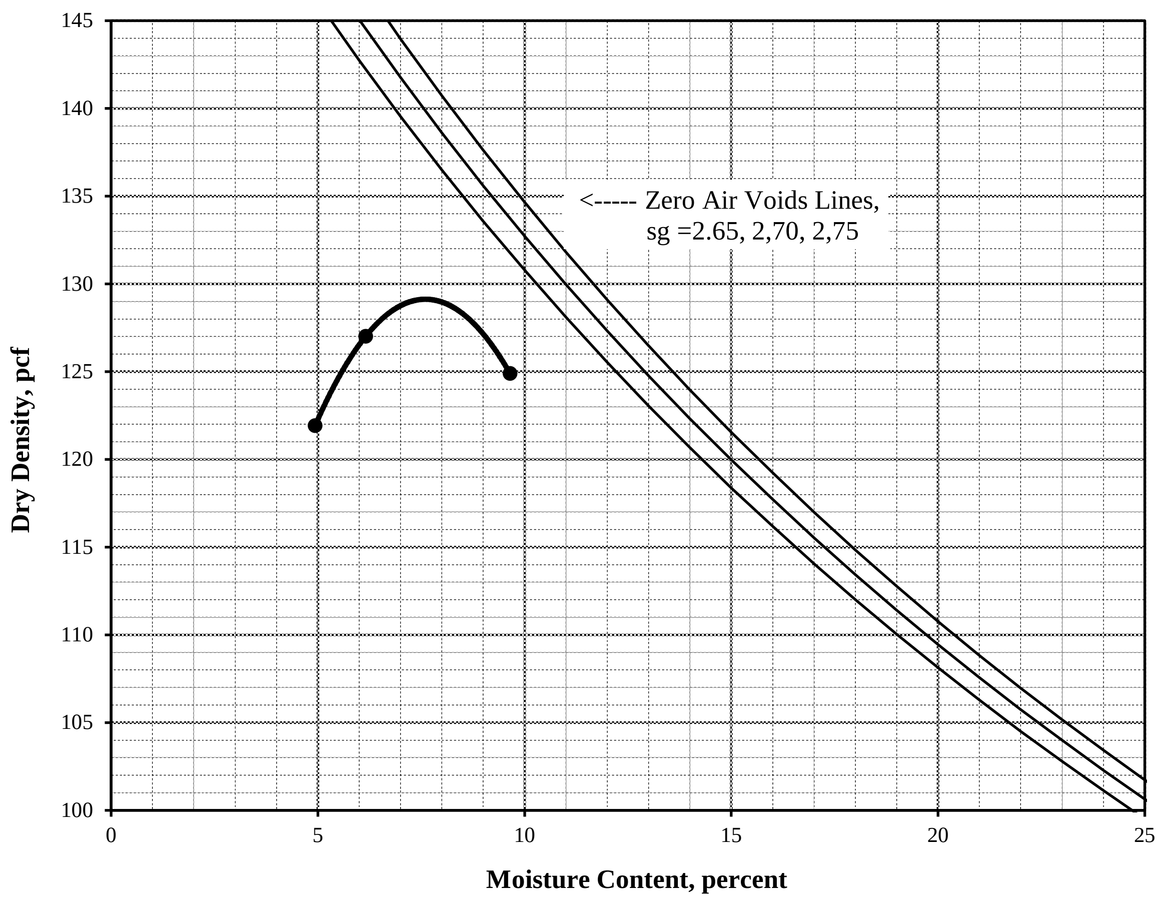
44732 Yucca Avenue
Lancaster, CA 93534
661-273-9078

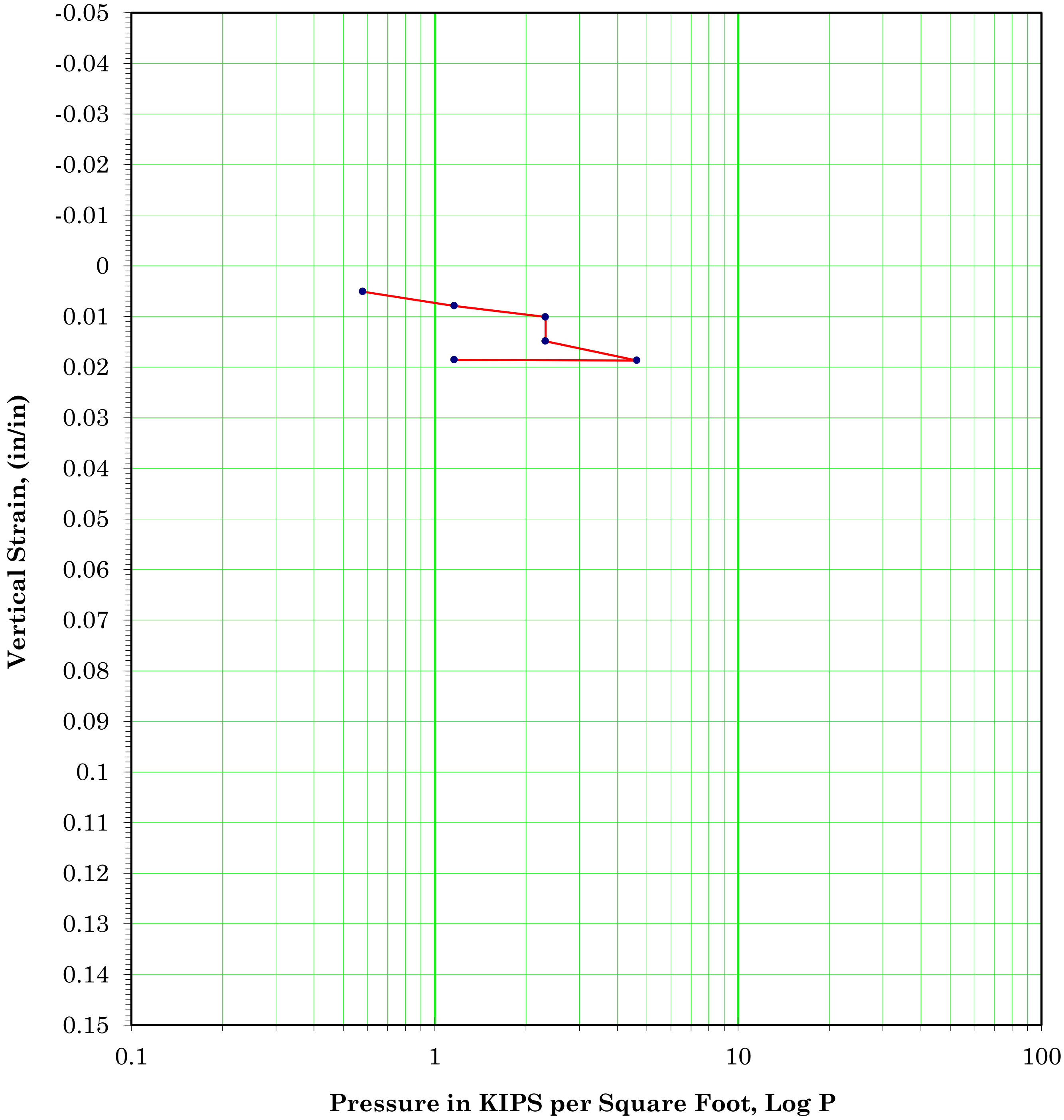
Maximum Density/Optimum Moisture Proctor ASTM D698/D1557

Project Number: 17-113 — November 14, 2017
Project Name: Cage — ASTM D-1557 C
Lab ID Number: 1 — Rammer Type: 10#
Sample Location: B12 0'-5'
Description: Moderate brown silty sand w/ fine to coarse sand

Maximum Density: **129 pcf**
Optimum Moisture: **7.5%**

Sieve Size	% Retained
3/4"	
3/8"	
#4	5.4





Sample Location: B2 @ 5'

Material: silty sand (SM)

Initial Dry Density: 114.0 PCF

Moisture Content: 5.6%

Percent Hydroconsolidation: 0.5%

* Test Method: ASTM D-2435

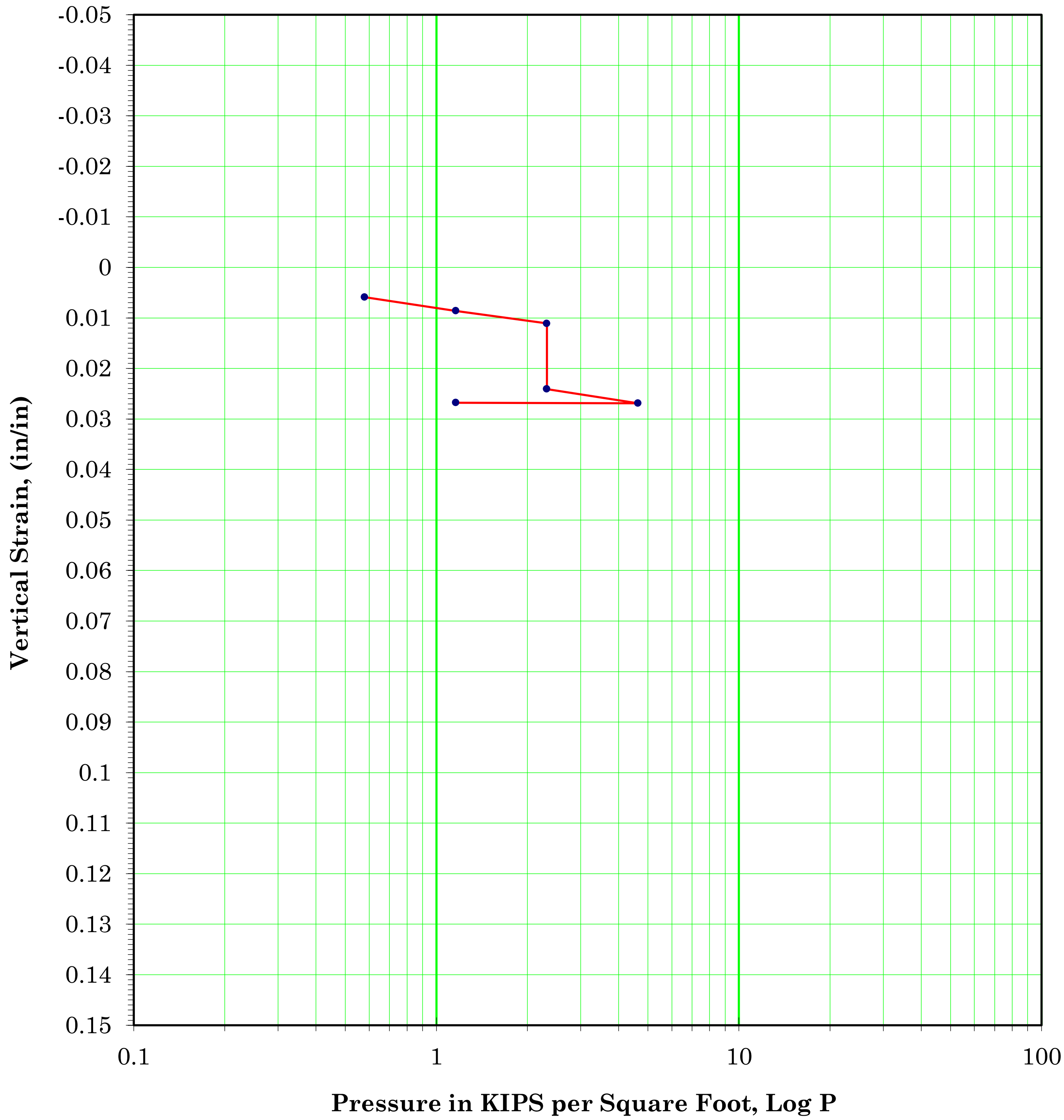
Consolidation Test

Cage

20th West and Ranch Vista

B G S I

8/20/2015	**17-113**



Consolidation Test

Cage

20th West and Ranch Vista

BGSI

Sample Location: B3 @ 10'

Material: poorly-graded sand (SP)

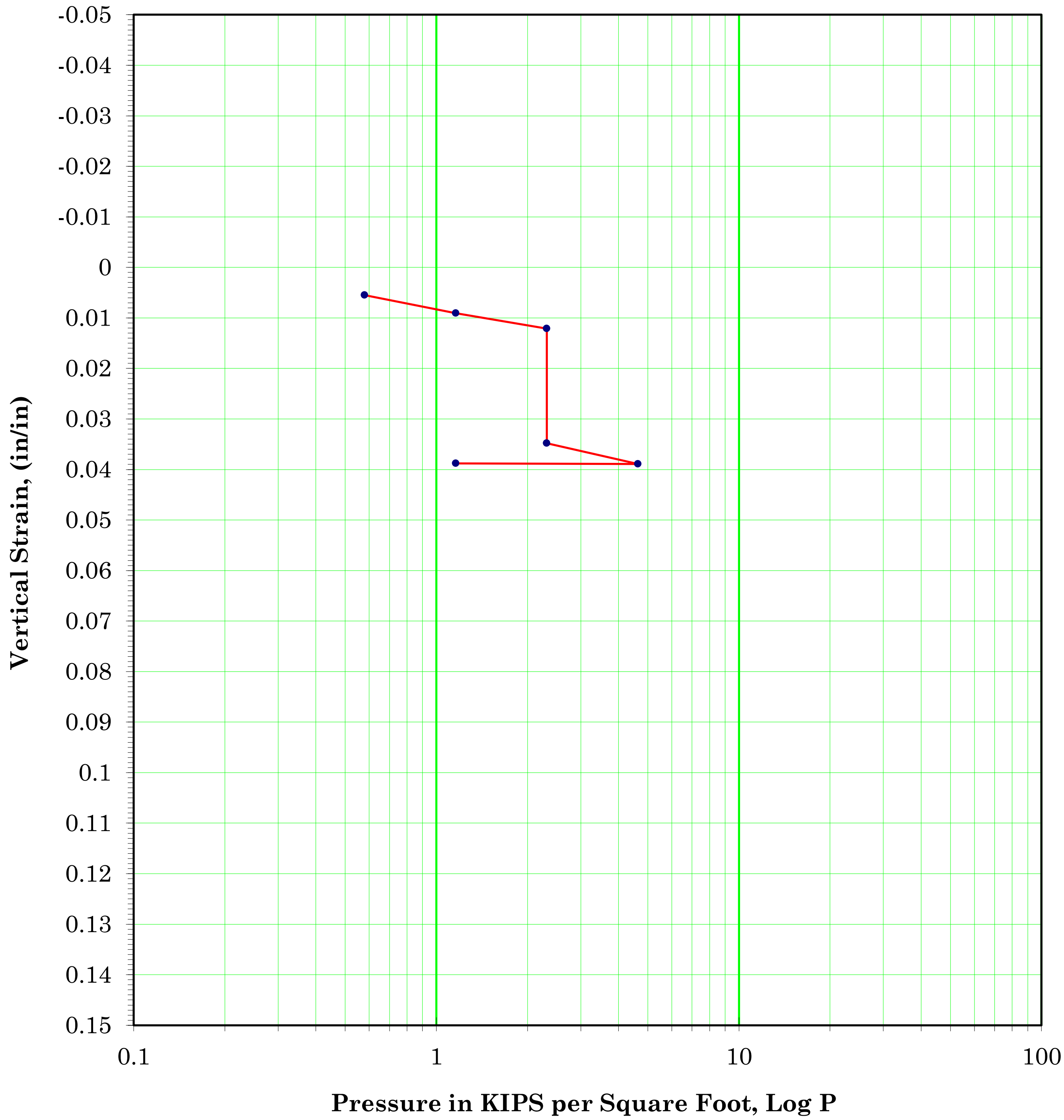
Initial Dry Density: 104.8 PCF

Moisture Content: 2.0%

Percent Hydroconsolidation: 1.3%

* Test Method: ASTM D-2435

8/20/2015	**17-113**



Sample Location: B5 @ 2'

Material: silty sand (SM)

Initial Dry Density: 107.2 PCF

Moisture Content: 1.9%

Percent Hydroconsolidation: 2.3%

* Test Method: ASTM D-2435

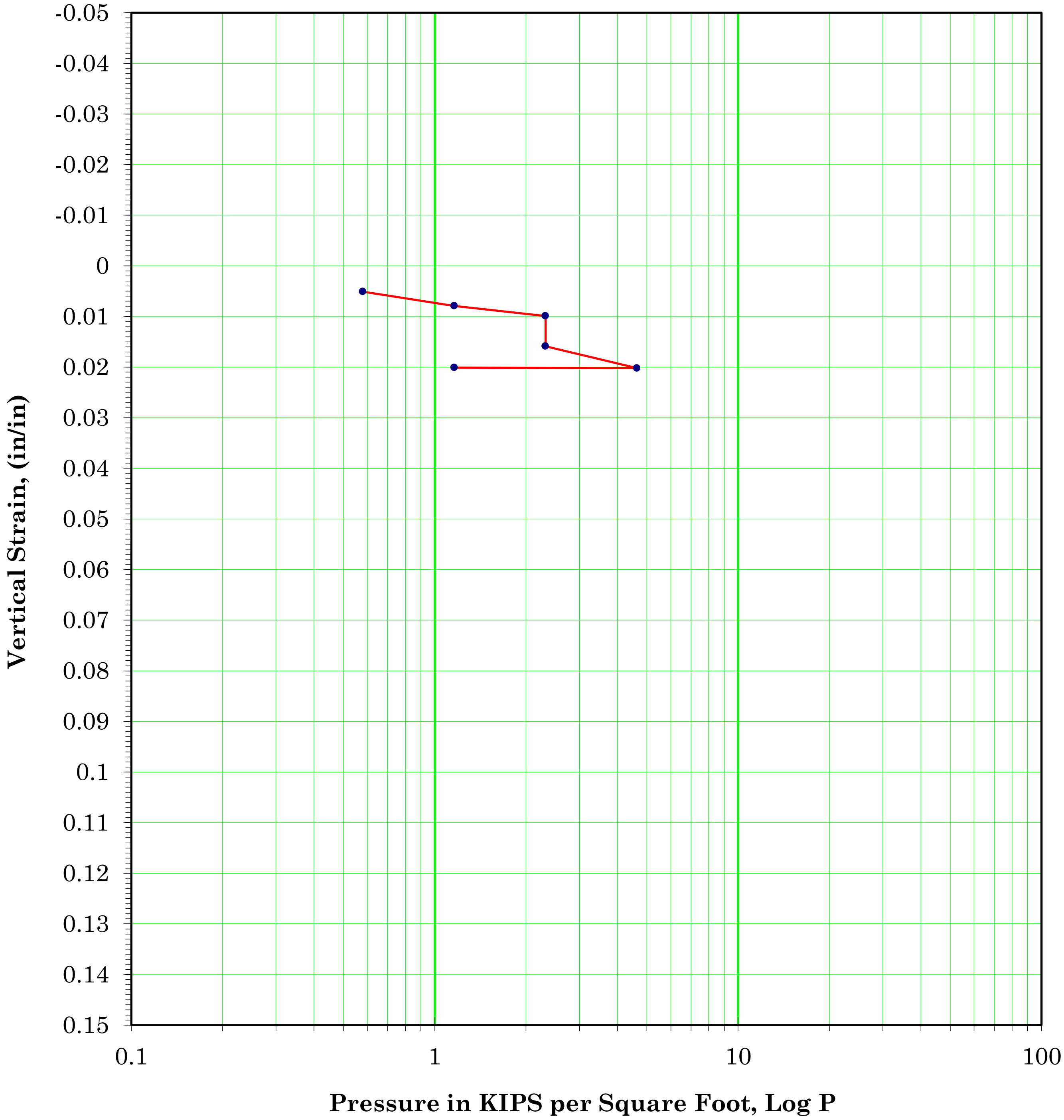
Consolidation Test

Cage

20th West and Ranch Vista

B G S I

8/20/2015	**17-113**



Sample Location: B5 @ 10'

Material: poorly-graded sand (SP)

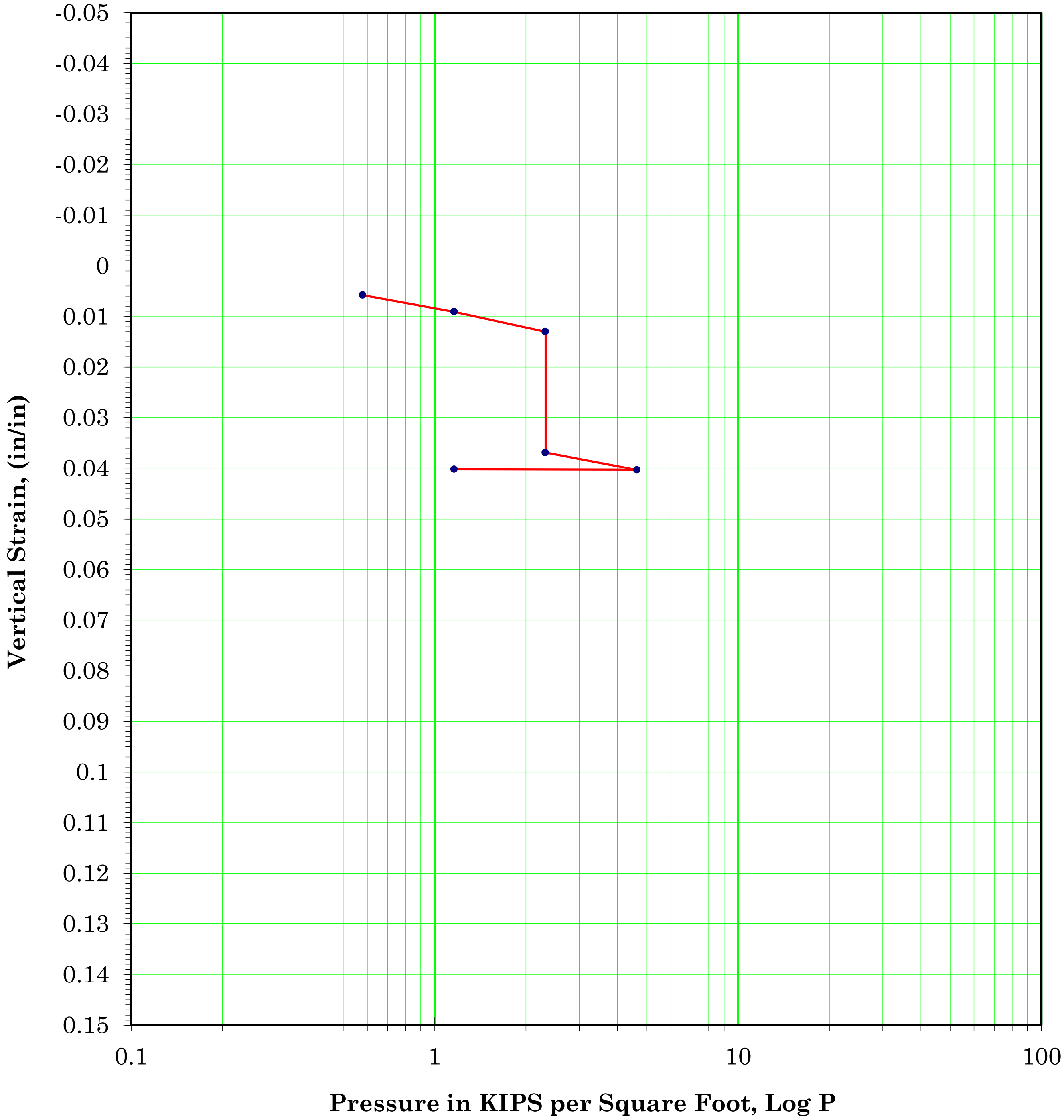
Initial Dry Density: 108.9 PCF

Moisture Content: 1.7%

Percent Hydroconsolidation: 0.6%

* Test Method: ASTM D-2435

Consolidation Test	
Cage 20th West and Ranch Vista	
BGSI	
8/20/2015	17-113



Sample Location: B7 @ 2'

Material: silty sand (SM)

Initial Dry Density: 107.2 PCF

Moisture Content: 1.6%

Percent Hydroconsolidation: 2.4%

* Test Method: ASTM D-2435

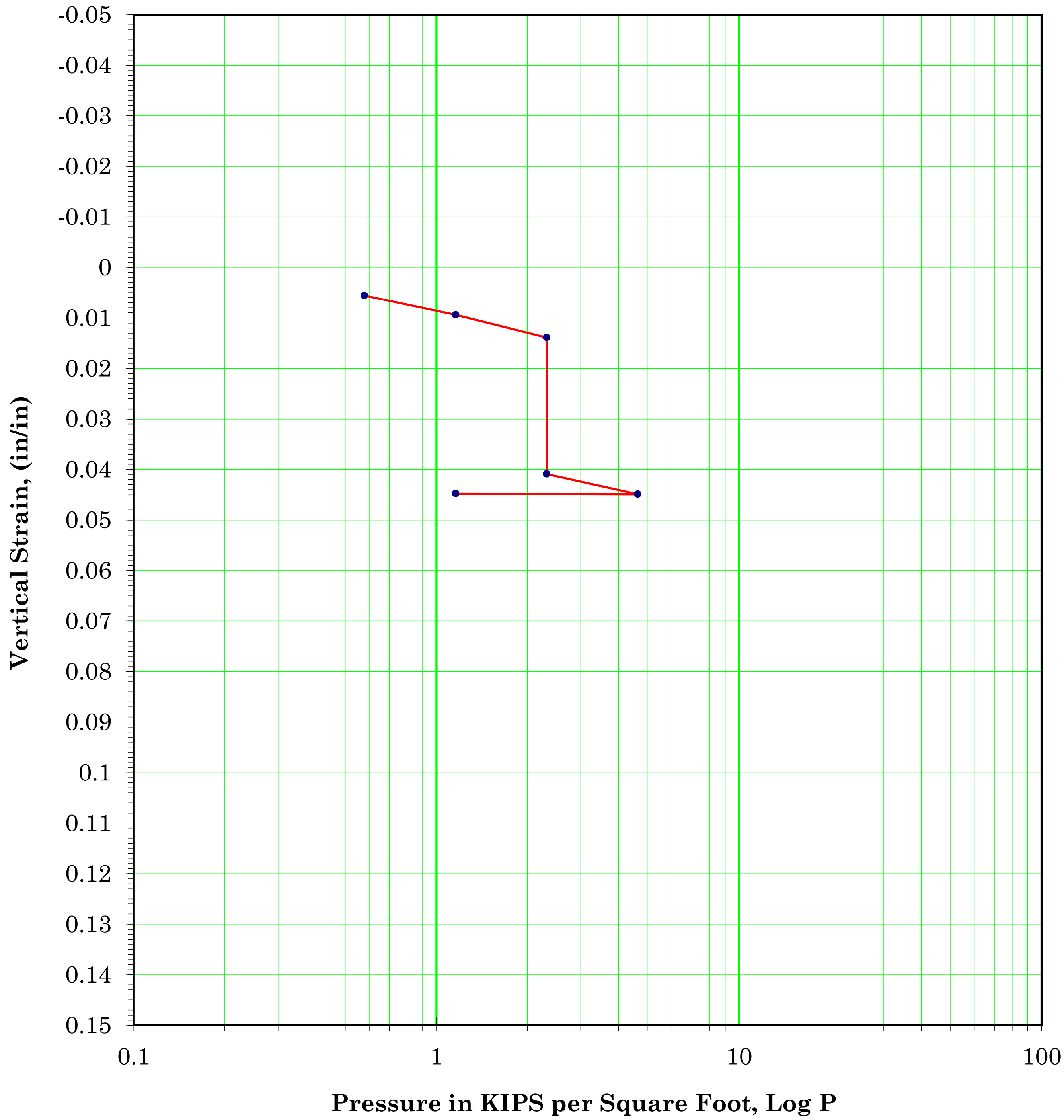
Consolidation Test

Cage

20th West and Ranch Vista

B G S I

8/20/2015	**17-113**



Consolidation Test	
Cage 20th West and Ranch Vista	
BGSI	
8/20/2015	17-113

Sample Location: B9 @ 3'

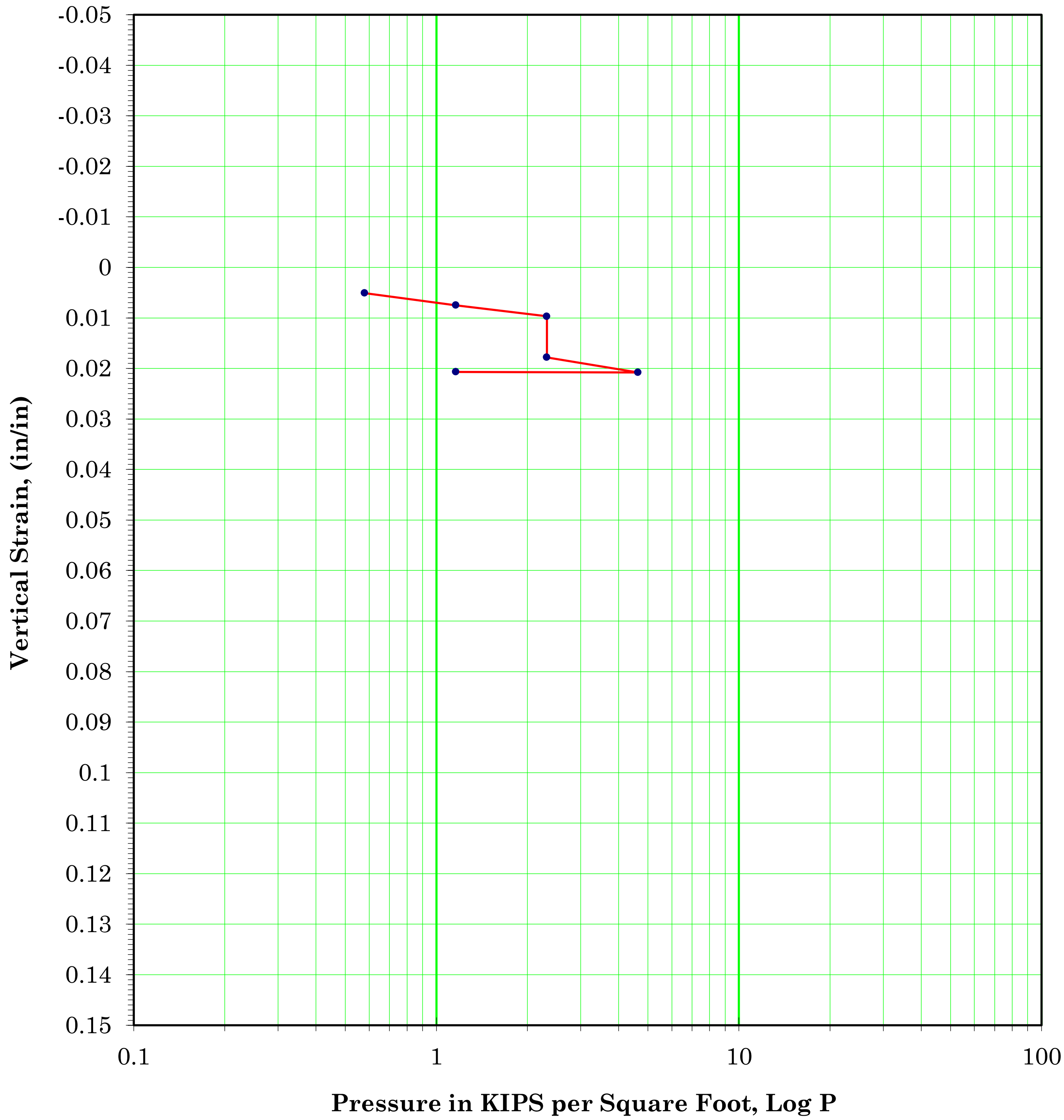
Material: silty sand (SM)

Initial Dry Density: 104.7 PCF

Moisture Content: 2.1%

Percent Hydroconsolidation: 2.7%

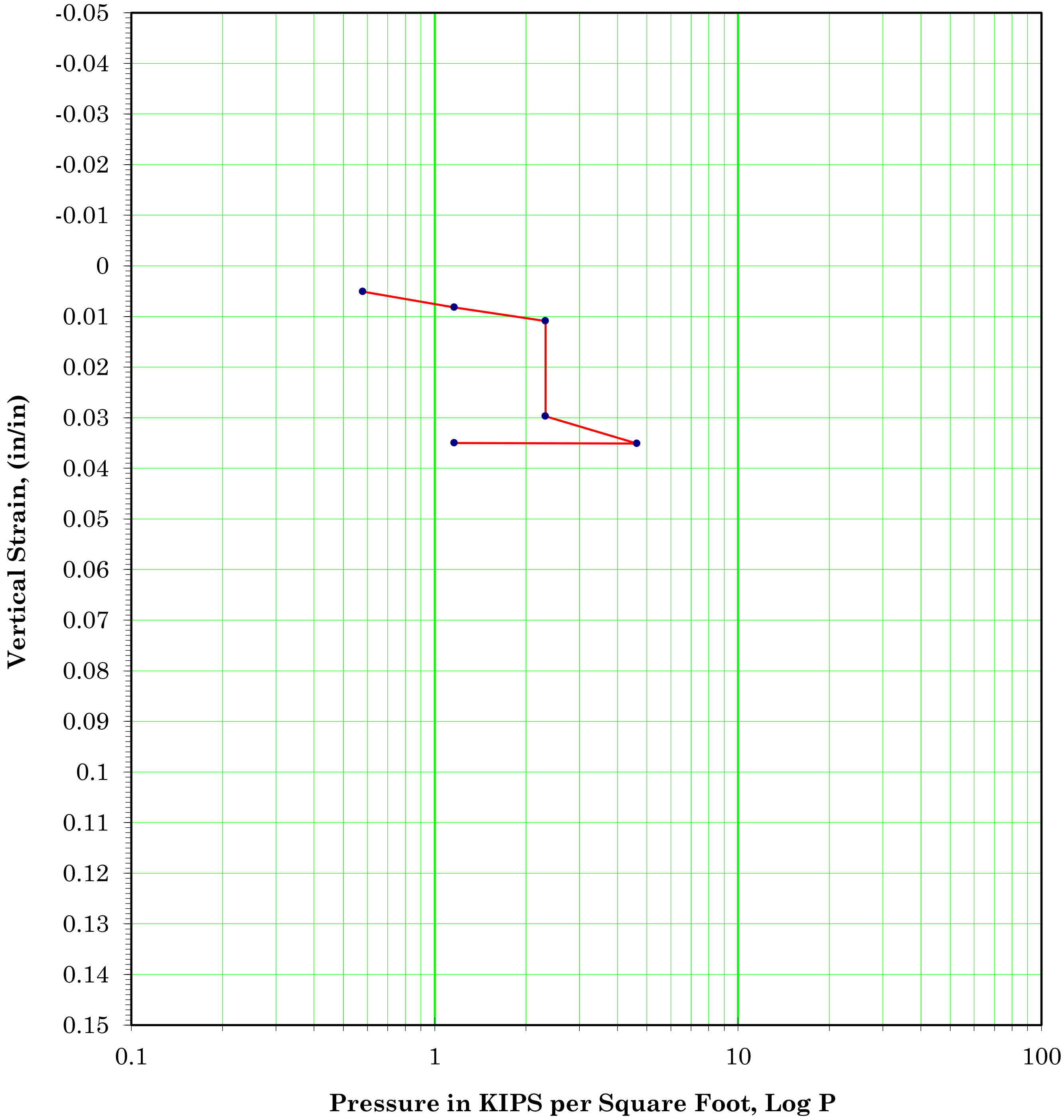
* Test Method: ASTM D-2435



Sample Location: B9 @ 15'
Material: silty sand (SM)
Initial Dry Density: 110.5 PCF
Moisture Content: 4.1%
Percent Hydroconsolidation: 0.8%

Consolidation Test	
Cage 20th West and Ranch Vista	
BGSI	
8/20/2015	17-113

* Test Method: ASTM D-2435



Consolidation Test

Cage

20th West and Ranch Vista

Sample Location: B11 @ 7'

Material: silty sand (SM)

Initial Dry Density: 109.2 PCF

Moisture Content: 3.0%

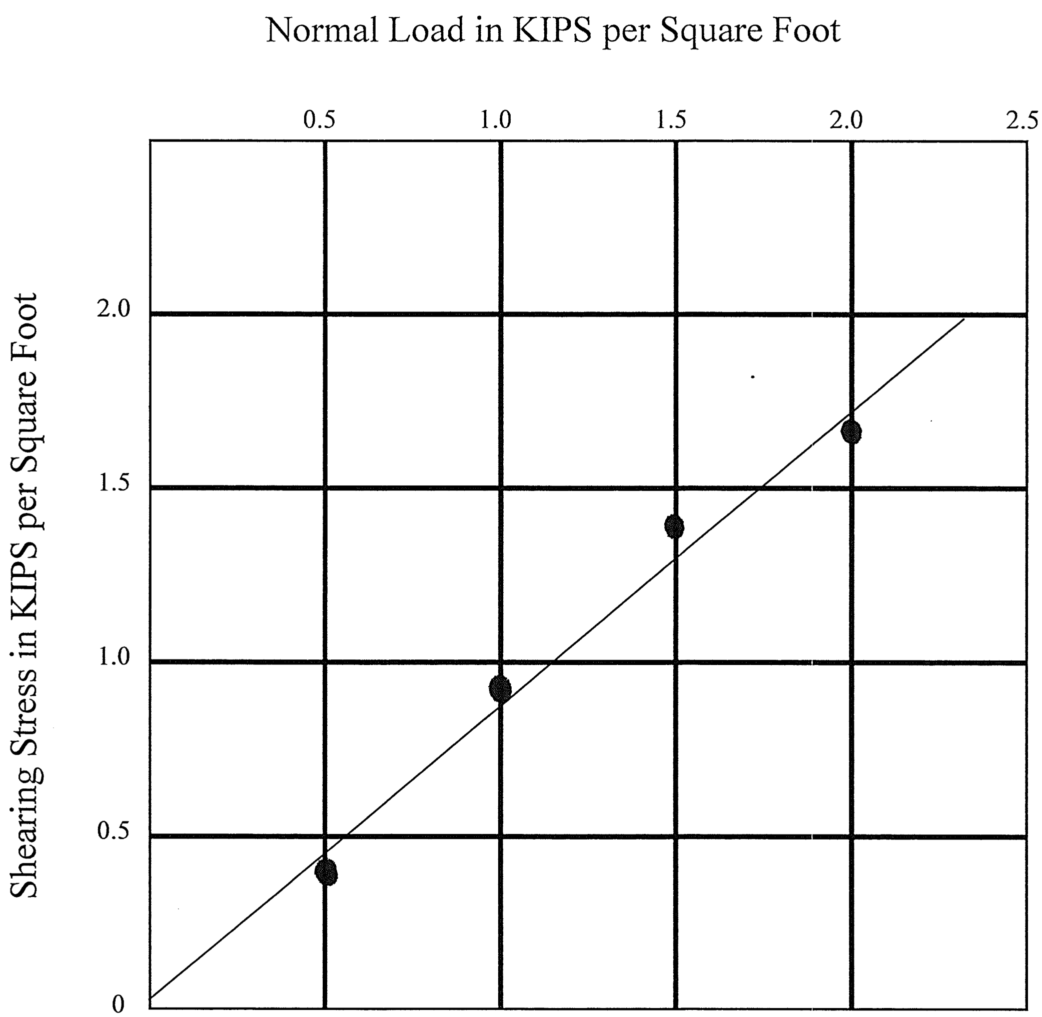
Percent Hydroconsolidation: 1.9%

B G S I

8/20/2015	**17-113**

* Test Method: ASTM D-2435

Direct Shear Data



Sample	Symbol	Depth (feet)	Dry Density (PCF)	Angle of Friction (degrees)	Cohesion (PSF)
B12	●	0-5'	116.1	39	30

*Remolded to 90% Rel. Comp. per ASTM D 1557 Test Method

ANAHEIM TEST LAB, INC

3008 ORANGE AVENUE
SANTA ANA, CALIFORNIA 92707
PHONE (714) 549-7267

BRUIN GEOTECHNICAL SERVICES, INC.
44732 Yucca Avenue
Lancaster, CA 93534

DATE: 11/08/17

P.O. NO.: TRANSMITTAL

LAB NO.: C-1159

SPECIFICATION: CA-417/422/643

MATERIAL: Soil

PROJECT#: 17-113
Cage Development
20th St. West & Ave P
Palmdale, CA

ANALYTICAL REPORT

CORROSION SERIES
SUMMARY OF DATA

	pH	SOLUBLE SULFATES per CA. 417 ppm	SOLUBLE CHLORIDES per CA. 422 ppm	MIN. RESISTIVITY per CA. 643 ohm-cm
B-3 @ 0-5'	6.9	123	54	10,500

RESPECTFULLY SUBMITTED

WES BRIDGER CHEMIST

APPENDIX C

USGS Seismic Design Summary Report

Design Maps Summary Report

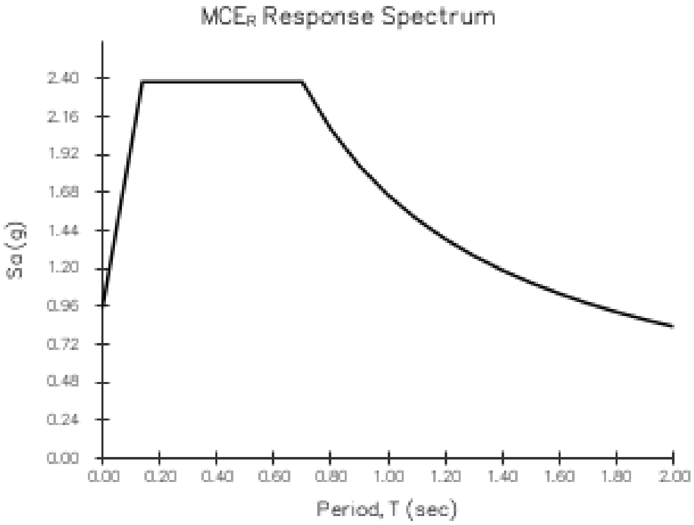
User–Specified Input

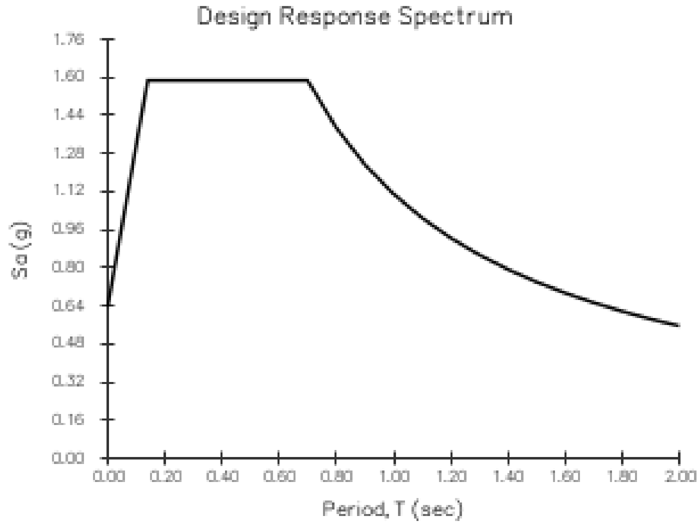
Report Title	Cage Palmdale, LLC Mon November 13, 2017 21:21:18 UTC
Building Code Reference Document	2012/2015 International Building Code (which utilizes USGS hazard data available in 2008)
Site Coordinates	34.6018°N, 118.1652°W
Site Soil Classification	Site Class D – “Stiff Soil”
Risk Category	I/II/III

USGS–Provided Output

$S_S =$ 2.381 g	$S_{MS} =$ 2.381 g	$S_{DS} =$ 1.587 g
$S_1 =$ 1.110 g	$S_{M1} =$ 1.665 g	$S_{D1} =$ 1.110 g

For information on how the SS and S1 values above have been calculated from probabilistic (risk-targeted) and deterministic ground motions in the direction of maximum horizontal response, please return to the application and select the “2009 NEHRP” building code reference document.





Although this information is a product of the U.S. Geological Survey, we provide no warranty, expressed or implied, as to the accuracy of the data contained therein. This tool is not a substitute for technical subject-matter knowledge.

Design Maps Detailed Report

2012/2015 International Building Code (34.6018°N, 118.1652°W)

Site Class D – “Stiff Soil”, Risk Category I/II/III

Section 1613.3.1 — Mapped acceleration parameters

Note: Ground motion values provided below are for the direction of maximum horizontal spectral response acceleration. They have been converted from corresponding geometric mean ground motions computed by the USGS by applying factors of 1.1 (to obtain S_S) and 1.3 (to obtain S_1). Maps in the 2012/2015 International Building Code are provided for Site Class B. Adjustments for other Site Classes are made, as needed, in Section 1613.3.3.

From Figure 1613.3.1(1) [1]	S_S = 2.381 g
From Figure 1613.3.1(2) [2]	S_1 = 1.110 g

Section 1613.3.2 — Site class definitions

The authority having jurisdiction (not the USGS), site-specific geotechnical data, and/or the default has classified the site as Site Class D, based on the site soil properties in accordance with Section 1613.

2010 ASCE-7 Standard – Table 20.3-1
SITE CLASS DEFINITIONS

Site Class	$\bar{v}_s$	$\bar{N}$ or $\bar{N}_{ch}$	$\bar{s}_u$
A. Hard Rock	>5,000 ft/s	N/A	N/A
B. Rock	2,500 to 5,000 ft/s	N/A	N/A
C. Very dense soil and soft rock	1,200 to 2,500 ft/s	>50	>2,000 psf
D. Stiff Soil	600 to 1,200 ft/s	15 to 50	1,000 to 2,000 psf
E. Soft clay soil	<600 ft/s	<15	<1,000 psf
	Any profile with more than 10 ft of soil having the characteristics: • Plasticity index *PI* > 20, • Moisture content *w* ≥ 40%, and • Undrained shear strength $\bar{s}_u$ < 500 psf		
F. Soils requiring site response analysis in accordance with Section 21.1	See Section 20.3.1		

For SI: 1ft/s = 0.3048 m/s 1lb/ft² = 0.0479 kN/m²

Section 1613.3.3 — Site coefficients and adjusted maximum considered earthquake spectral response acceleration parameters

TABLE 1613.3.3(1)
VALUES OF SITE COEFFICIENT F_a

Site Class	Mapped Spectral Response Acceleration at Short Period				
	$S_S \leq 0.25$	$S_S = 0.50$	$S_S = 0.75$	$S_S = 1.00$	$S_S \geq 1.25$
A	0.8	0.8	0.8	0.8	0.8
B	1.0	1.0	1.0	1.0	1.0
C	1.2	1.2	1.1	1.0	1.0
D	1.6	1.4	1.2	1.1	1.0
E	2.5	1.7	1.2	0.9	0.9
F	See Section 11.4.7 of ASCE 7				

Note: Use straight–line interpolation for intermediate values of S_S

For Site Class = D and S_S = 2.381 g, F_a = 1.000

TABLE 1613.3.3(2)
VALUES OF SITE COEFFICIENT F_v

Site Class	Mapped Spectral Response Acceleration at 1–s Period				
	$S_1 \leq 0.10$	$S_1 = 0.20$	$S_1 = 0.30$	$S_1 = 0.40$	$S_1 \geq 0.50$
A	0.8	0.8	0.8	0.8	0.8
B	1.0	1.0	1.0	1.0	1.0
C	1.7	1.6	1.5	1.4	1.3
D	2.4	2.0	1.8	1.6	1.5
E	3.5	3.2	2.8	2.4	2.4
F	See Section 11.4.7 of ASCE 7				

Note: Use straight–line interpolation for intermediate values of S_1

For Site Class = D and S_1 = 1.110 g, F_v = 1.500

Equation (16-37): $S_{MS} = F_aS_S = 1.000 \times 2.381 = 2.381$ g

Equation (16-38): $S_{M1} = F_vS_1 = 1.500 \times 1.110 = 1.665$ g

Section 1613.3.4 — Design spectral response acceleration parameters

Equation (16-39): $S_{DS} = ⅔\ S_{MS} = ⅔ \times 2.381 = 1.587$ g

Equation (16-40): $S_{D1} = ⅔\ S_{M1} = ⅔ \times 1.665 = 1.110$ g

Section 1613.3.5 — Determination of seismic design category

TABLE 1613.3.5(1)
SEISMIC DESIGN CATEGORY BASED ON SHORT-PERIOD (0.2 second) RESPONSE ACCELERATION

VALUE OF S_{DS}	RISK CATEGORY		
	I or II	III	IV
$S_{DS} < 0.167g$	A	A	A
$0.167g \le S_{DS} < 0.33g$	B	B	C
$0.33g \le S_{DS} < 0.50g$	C	C	D
$0.50g \le S_{DS}$	D	D	D

For Risk Category = I and S_{DS} = 1.587 g, Seismic Design Category = D

TABLE 1613.3.5(2)
SEISMIC DESIGN CATEGORY BASED ON 1-SECOND PERIOD RESPONSE ACCELERATION

VALUE OF S_{D1}	RISK CATEGORY		
	I or II	III	IV
$S_{D1} < 0.067g$	A	A	A
$0.067g \le S_{D1} < 0.133g$	B	B	C
$0.133g \le S_{D1} < 0.20g$	C	C	D
$0.20g \le S_{D1}$	D	D	D

For Risk Category = I and S_{D1} = 1.110 g, Seismic Design Category = D

Note: When S_1 is greater than or equal to 0.75g, the Seismic Design Category is **E** for buildings in Risk Categories I, II, and III, and **F** for those in Risk Category IV, irrespective of the above.

Seismic Design Category ≡ "the more severe design category in accordance with Table 1613.3.5(1) or 1613.3.5(2)" = E

Note: See Section 1613.3.5.1 for alternative approaches to calculating Seismic Design Category.

References

1. *Figure 1613.3.1(1)*: https://earthquake.usgs.gov/hazards/designmaps/downloads/pdfs/IBC-2012-Fig1613p3p1(1).pdf
2. *Figure 1613.3.1(2)*: https://earthquake.usgs.gov/hazards/designmaps/downloads/pdfs/IBC-2012-Fig1613p3p1(2).pdf

APPENDIX D

General Earthwork and Grading Guidelines

Earthwork and Grading Specifications for Rough Grading

1.0 General

1.1 **Intent:** These General Earthwork and Grading Specifications are for the grading and earthwork shown on the approved grading plan(s) and/or indicated in the geotechnical report(s). These Specifications are a part of the recommendations contained in the geotechnical report(s). In case of conflict, the specific recommendations in the geotechnical report shall supersede these more general Specifications. Observations of the earthwork by the project Geotechnical Consultant during the course of grading may result in new or revised recommendations that could supersede these specifications or the recommendations in the geotechnical report(s).

1.2 **The Geotechnical Consultant of Record:** Prior to commencement of work, the owner shall employ a qualified Geotechnical Consultant of Record (Geotechnical Consultant). The Geotechnical Consultant shall be responsible for reviewing the approved geotechnical report(s) and accepting the adequacy of the preliminary geotechnical findings, conclusions, and recommendations prior to the commencement of the grading.

Prior to commencement of grading, the Geotechnical Consultant shall review the "work plan" prepared by the Earthwork Contractor (Contractor) and schedule sufficient personnel to perform the appropriate level of observations, mapping, and compaction testing.

During the grading and earthwork operations, the Geotechnical Consultant shall observe, map, and document the subsurface exposures to verify the geotechnical design assumptions. If the observed conditions are found to be significantly different than the interpreted assumptions during the design phase, the Geotechnical Consultant shall inform the owner, recommend appropriate changes in design to accommodate the observed conditions, and notify the review agency where required.

The Geotechnical Consultant shall observe the moisture-conditioning and processing of the subgrade and fill materials and perform relative compaction testing of fill to confirm that the attained level of compaction is being accomplished as specified. The Geotechnical Consultant shall provide the test results to the owner and the Contractor on a routine and frequent basis.

1.3 **The Earthwork Contractor:** The Earthwork Contractor (Contractor) shall be qualified, experienced, and knowledgeable in earthwork logistics, preparation and processing of ground to receive fill, moisture-conditioning and processing of fill, and compacting fill. The Contractor shall review and accept plans, geotechnical report(s), and these Specifications prior to commencement of grading. The Contractor shall be solely responsible for performing the grading in accordance with the project plans and specifications. The Contractor shall prepare and submit to the owner and the Geotechnical Consultant a work plan that indicates the sequence of earthwork grading, the number of "equipment" of work and the estimated quantities of daily earthwork contemplated for the site prior to commencement of grading. The Contractor shall inform the owner and the Geotechnical Consultant of changes in work schedules and updates to the work plan at least 24 hours in advance of such changes so that appropriate personnel will be available for observation and testing. The Contractor shall not assume that the Geotechnical Consultant is aware of all grading operations.

The Contractor shall have the sole responsibility to provide adequate equipment and methods to accomplish the earthwork in accordance with the applicable grading codes and agency ordinances, these Specifications, and the recommendations in the approved geotechnical report(s) and grading plan(s). If, in the opinion of the Geotechnical Consultants, unsatisfactory conditions, such as unsuitable soil, improper moisture-condition, inadequate compaction, insufficient buttress key size, adverse weather, etc., are resulting in a quality of work less than required in the specifications, the Geotechnical Consultant shall reject the work and may recommend to the owner that construction be stopped until the conditions are rectified. It is the contractor's sole responsibility to provide proper fill compaction.

2.0 Preparation of Areas to be Filled

2.1 **Clearing and Grubbing:** Vegetation, such as brush, grass, roots, and other deleterious material shall be sufficiently removed and properly disposed of in a method acceptable to the owner, governing agencies, and the Geotechnical Consultant.

The Geotechnical Consultant shall evaluate the extent of these removals depending on specific site conditions. Earth fill material shall not contain more than 1 percent of organic materials (by volume). No fill lift shall contain more than 10 percent of organic matter. Nesting of the organic materials shall not be allowed.

If potentially hazardous materials are encountered, the Contractor shall stop work in the affected area, and a hazardous material specialist shall be informed immediately for proper evaluation and handling of these materials prior to continuing to work in that area.

As presently defined by the State of California, most refined petroleum products (gasoline, diesel fuel, motor oil, grease, coolant, etc.) have chemical constituents that are considered to be hazardous waste. As such, the indiscriminant dumping or spillage of these fluids onto the ground may constitute a misdemeanor, punishable by fines and/or imprisonment, and shall not be allowed. The contractor is responsible for all hazardous waste relating to his work. The Geotechnical Consultant does not have expertise in this area. If hazardous waste is a concern, then the Client should acquire the services of a qualified environmental assessor.

2.2 **Processing:** Existing ground that has been declared satisfactory for support of fill by the Geotechnical Consultant shall be scarified to a minimum depth of 6 inches. Existing ground that is not satisfactory shall be overexcavated as specified in the following section. Scarification shall continue until soils are broken down and free from oversize material and the working surface is reasonably uniform, flat, and free from uneven features that would inhibit uniform compaction.

2.3 **Overexcavation:** In addition to removals and overexcavations recommended in the approved geotechnical report(s) and the grading pan, soft, loose, dry, saturated, spongy, organic-rich, highly fractured or otherwise unsuitable ground shall be overexcavated to competent ground as evaluated by the Geotechnical Consultant during grading.

2.4 **Benching:** Where fills are to be places on ground with slopes steeper than 5:1 (horizontal to vertical units), the ground shall be stepped or benched. The lowest bench or key shall be a minimum of 15 feet wide and at least 2 feet deep, into competent material as evaluated by the Geotechnical Consultant. Other benches shall be excavated a minimum height of 4 feet into competent material or as otherwise recommended by the Geotechnical Consultant. Fill placed on ground sloping flatter that 5:1 shall also be benched or otherwise overexcavated to provide a flat subgrade for the fill.

2.5 **Evaluation/Acceptance of Fill Areas:** All areas to receive fill, including removal and processed areas, key bottoms, and benches, shall be observes, mapped, elevations recorded, and/or tested prior to being accepted by the Geotechnical Consultant as suitable to receive fill. The Contractor shall obtain a written acceptance from the Geotechnical Consultant prior to fill placement. A licensed surveyor shall provide the survey control for determining elevations of processed areas, keys, and benches.

3.0 Fill Material

3.1 **General:** Material to be used as fill shall be essentially free of organic matter and other deleterious substances evaluated and accepted by the Geotechnical Consultant prior to placement. Soils of poor quality, such as those with unacceptable gradation, high expansion potential, or low strength shall be placed in areas acceptable to the Geotechnical Consultant or mixed with other soils to achieve satisfactory fill material.

3.2 **Oversize:** Oversize material defined as rock, or other irreducible material with a maximum dimension greater than 8 inches, shall not be buried or placed in fill unless location, materials, and placement methods are specifically accepted by the Geotechnical Consultant. Placement operations shall be such that nesting of oversized material does not occur and such that oversize material is completely surrounded by compacted or densified fill. Oversize material shall not be placed within 10 vertical feet of finish grade or within 2 feet of future utilities or underground construction.

3.3 **Import:** If importing of fill material is required for grading, proposed import material shall meet the requirements of the geotechnical report(s). The potential import source shall be given to the Geotechnical Consultant at least 48 hours (2 working days) before importing begins so the suitability can be determined and appropriate tests performed.

4.0 Fill Placement and Compaction

4.1 **Fill Layers:** Approved fill material shall be placed in areas prepared to receive fill in near-horizontal layers not exceeding 8 inches in loose thickness. The Geotechnical Consultant may accept thicker layers if testing indicates that grading procedures can adequately compact the thicker layers. Each layer shall be spread evenly and mixed thoroughly to attain relative uniformity of material and moisture throughout.

4.2 **Fill Moisture Conditioning:** Fill soils shall be watered, dried back, blended, and/or mixed, as necessary to attain relatively uniform moisture content within 2% of optimum. Maximum density and optimum soil moisture content tests shall be performed in accordance with the American Society of Testing and Materials (ASTM Test Method D1557-91).

4.3 **Compaction of Fill:** After each layer has been moisture-conditioned, mixed, and evenly spread, it shall be uniformly compacted to not less than 90 percent of maximum dry density (ASTM Test Method D1557-91). Compaction equipment shall be adequately sized and be either specifically designed for soil compaction or of proven reliability to efficiently achieve the specified level of compaction with uniformity.

4.4 **Compaction of Fill Slopes:** In addition to normal compaction procedures specified above, compaction of slopes, shall be accomplished by backrolling of slopes with sheepfoot rollers at increments of 3 to 4 feet in fill elevation, or by other methods producing satisfactory results acceptable to the Geotechnical Consultant. Upon completion of grading, relative compaction of the fill, out to the slope face, shall be at least 90 percent of maximum density per ASTM Test Method D1557-91.

4.5 **Compaction Testing:** Field tests for moisture content and relative compaction of the fill soils shall be performed by the Geotechnical Consultant. Location and frequency of tests shall be at the Consultant's discretion based on field conditions encountered. Compaction test locations will not necessarily be selected on a random basis. Test locations shall be selected to verify adequacy of compaction levels in areas that are judged to be prone to inadequate compaction (such as close to slope faces and at the fill/bedrock benches).

4.6 **Frequency of Compaction Testing:** Tests shall be taken at intervals not exceeding 2 feet in vertical rise and/or 1,000 cubic yards of compacted fill soils embankment. In addition, as a guideline, at least one test shall be taken on slope faces for each 5,000 square feet of slope face and/or each 10 feet of vertical height of slope. The Contractor shall assure that fill construction is such that the testing schedule can be accomplished by the Geotechnical Consultant. The Contractor shall stop or slow down the earthwork construction if these minimum standards are not met.

4.7 **Compaction Test Locations:** The Geotechnical Consultant shall document the approximate elevation and horizontal coordinates of each test location. The Contractor shall coordinate with the project surveyor to assure that sufficient grade stakes are established so that the Geotechnical Consultant can determine the test locations with sufficient accuracy. At a minimum, two grade stakes within a horizontal distance of 100 feet and vertically less then 5 feet apart from potential test locations shall be provided.

5.0 Subdrain Installation

Subdrain systems shall be installed in accordance with the approved geotechnical repot(s), the grading plan, and the Standard Details. The Geotechnical Consultant may recommend additional subdrains and/or changes in subdrain extent, location, grade, or material depending on conditions encountered during grading. All subdrains shall be surveyed by a land survey/civil engineer for line and grade after installation and prior to burial. Sufficient time should be allowed by the Contractor for these surveys.

6.0 Excavation

Excavations, as well we over-excavation for remedial purposes, shall be evaluated by the Geotechnical Consultant during grading. Remedial removal depths shown on geotechnical plans are estimates only. The actual extent of removal shall be determined by the Geotechnical Consultant based on the field evaluation of exposed conditions during grading. Where fill-over-cut slopes are to be graded, the cut portion of the slope shall be made, evaluated, and accepted by the Geotechnical Consultant prior to placement of materials for construction of the fill portion of the slope, unless otherwise recommended by the Geotechnical Consultant.

7.0 Trench Backfills

7.1 The Contractor shall follow all OHSA and Cal/OSHA requirements for safety of trench excavations.

7.2 All bedding and backfill of utility trenches shall be done in accordance with the applicable provisions of Standard Specifications of Public Works Construction. Bedding Material shall have a Sand Equivalent greater then 30 (SE>30). The bedding shall be placed to 1 foot over the top of the conduit and densified by jetting. Backfill shall be placed and densified to a minimum of 90 percent of maximum from 1 foot above the top of the conduit to the surface.

7.3 The jetting of the bedding around the conduits shall be observed by the Geotechnical Consultant.

7.4 The Geotechnical Consultant shall test the trench backfill for relative compaction. At least one test should be made for every 300 feet of trench and 2 feet of fill.

7.5 Lift thickness of trench backfill shall not exceed those allowed in the Standard Specifications of Public Works Construction unless the Contractor can demonstrate to the Geotechnical Consultant that the fill lift can be compacted to the minimum relative compaction by his alternative equipment and method.

APPENDIX: D

APN 3005-005-014, 024, 025, 023

20th Street West and Rancho Vista Blvd
Palmdale, CA 93550

CONCEPTUAL HYDROLOGY STUDY

Prepared For:

Cage Palmdale LLC
1666 McCadden Place
Hollywood, CA 90028

REGISTERED PROFESSIONAL ENGINEER
RYAN DUKE
C079729
Exp. 9-30-20
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Prepared By:

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Lancaster, California 93534
Phone 661-992-8199

Date: November 20, 2019

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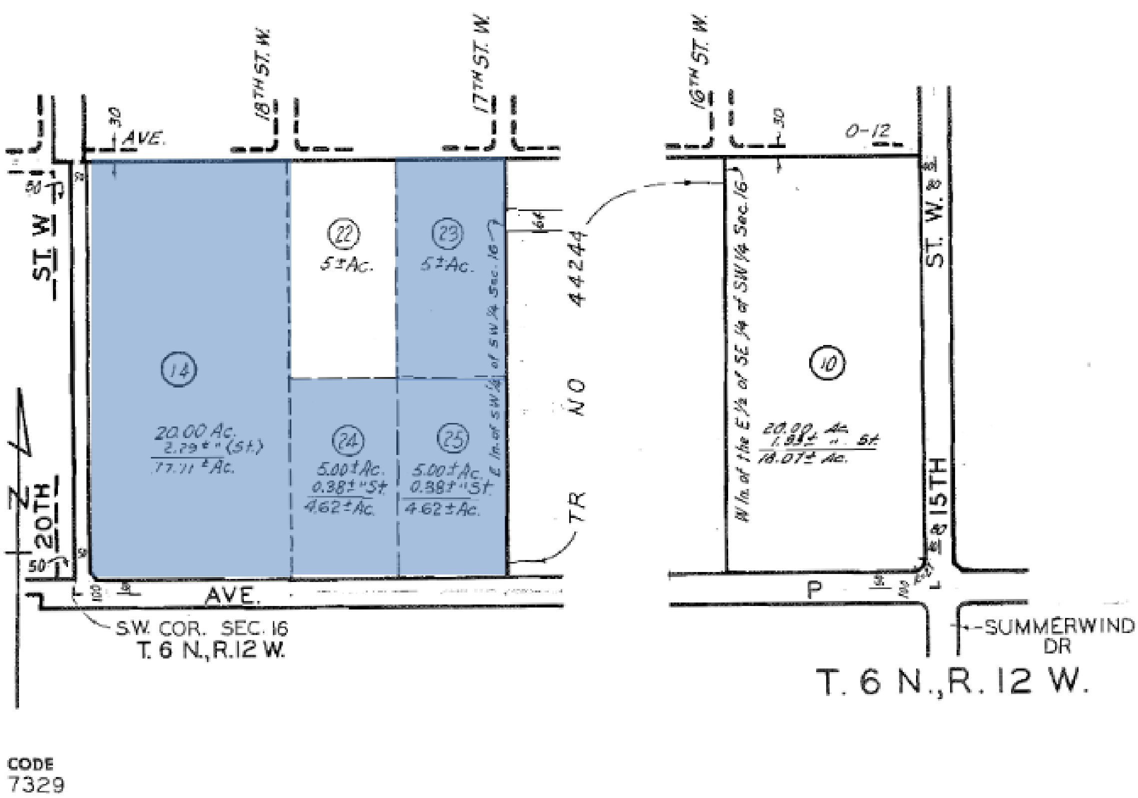
Introduction

The purpose of this report is to address the on-site drainage conditions within the subject property located at 20th Street West and Rancho Vista Blvd. The results of this report will size the on-site detention basins and corresponding underground storm drain utilities to safely convey storm water generated from the project site.

Project Location

The project site is located at the North-East intersection of 20th street west and Rancho Vista Blvd. The subject property is approximately 35 acres and is currently undeveloped native desert with street improvements along the westerly and southerly boundary lines, and a residential community along the northerly and easterly boundary lines.



Existing Conditions

The current on-site drainage conditions consist of 2 primary areas. They are roughly described as the Westerly half, and the Easterly Half. The drainage from the site flows from South to North with the upper limits being the existing roadway (Rancho Vista Blvd). The site does not accept off-site storm water run-off from Rancho Vista Blvd, as there is an existing graded swale along the northerly half of the roadway (see below). This graded swale drains from West to East where it ties into the existing curb and gutter adjacent to the housing tract East of the project site.

Along the Westerly portion of the project site, a similar graded swale exists along the easterly half of 20th Street West, which protects the site from additional off-site storm water runoff.

The drainage conditions for this site can be characterized as draining from South to North at an approximate slope of 1.5%. The terrain in this area has some swales and knolls that divide the site into the two halves (westerly and easterly). This rolling terrain creates two valleys that concentrate the on-site storm water runoff into two primary streams. The point at which these two streams intersect the Northerly property line, will be the proposed location of two on-site retention/detention basins.

There are existing single-family homes constructed North of the subject property, mostly consisting of rural large lots greater than 1 acre. There are no paved streets or city maintained storm drain infrastructure for the site to drain into, therefore the proposed basin over flow will need to drain back into the existing drainage coarse after mitigating the delta Q from the hydrologic analysis. The two main streams roughly align to 17th Street West and 18th Street West. Therefore, the proposed basin overflow locations should be aligned to the existing swales at these two locations.

Proposed Improvements

Overall Site Storm Water Mitigation:

The proposed improvements will complement the existing drainage patterns and will flow towards the unimproved street, Avenue O-12, where two proposed retention/detention basins will collect the storm water runoff from the surface and storm drained flows. The site will consist of residential dwelling units with both multi-family buildings as well as a single-family home component. There will be many open space (pervious) areas that will help to mitigate the delta Q for the site. These open space areas will be primarily centered around the multi-family component where larger building footprints and parking lots will increase the square footage of impervious surfaces.

Westerly Storm Water Basin:

The proposed run-off mitigation improvements along the westerly portion of the project site, will be as previously mentioned, storm water basins near Avenue O-12. The westerly basin, located approximately 600 feet East of 20th Street West along Avenue Q-12, will be sized to handle half of the multi-family component and most of the single family home component. It shall be constructed to the volume required to mitigate the delta Q, (see calculations). To control the required volume of this basin, small intermediate linear/landscape depressions, upstream from this basin, can be used to collect storm water runoff and percolate prior to entering the proposed storm drain system. These depressions will account for portions of the required volume storage and will help to decrease the overall size of the main basin along Avenue O-12 the Northerly boundary.

Easterly Storm Water Basin:

This proposed easterly storm water basin will collect mainly multi-family home storm water run-off and will also be located along Avenue O-12 at the easterly property line. This basin will collect water primarily from a proposed storm drain system that will be located within the future drive aisle for this housing development. This basin will be constructed as a retention/detention basin as well, with the outlet being onto Avenue Q-12, back to the existing drainage path.

Hydraulic Analysis:

The hydraulic analysis broke the site into 2 main streams that are directly associated with the proposed developments conceptual layout. At the end of each stream is a proposed detention / retention basin that will mitigate the delta Q for the improved site.

Hydrologic Criteria:

- ISOYHET Rainfall: 4.0 in
- STORM EVENT: 25 – Year
- Soil Type: 124 & 134

The results of the analysis:

Westerly Portion: (Pre-Developed)

- Flowrate (Q): 3.12
- Acres: 19.1
- Volume (ac-ft): 0.998

Westerly Portion: (Post-Developed)

Delta V: 0.32 ac-feet

- Flowrate (Q): 5.00
- Acres: 9.6
- Volume (ac-ft): 1.17

Easterly Portion: (Pre-Developed)

- Flowrate (Q): 2.06
- Acres: 12.7
- Volume (ac-ft): 0.66

Easterly Portion: (Post-Developed)

Delta V: 2.21 ac-feet

- Flowrate (Q): 14.18
- Acres: 22.2
- Volume (ac-ft): 2.77

Total Basin Volume Required:

Determined from the results of the analysis, a total basin volume for the site shall be 2.62 ac-ft. This volume will be shared between the easterly and westerly basin's at the Northerly property line. Landscape depressions and isolated basins within the open space of the multi-family section of the proposed project have not been included in this analysis.

During final design a storm drain system may be designed within utility easements to connect both basin's and allow for the future street improvements to drain into the proposed on-site basins which will collect and convey storm water to the North.

If easements are not obtainable during final design, on-site storm drain systems shall be designed to collect storm water tributary to the Westerly basin and convey them to the Easterly basin to balance the storm water retention volume.

20th Street West and Avenue P Development

Basin Sizing

Basin A: Westerly Basin			Basin B: Easterly Basin		
Depth 0'	2,821	Volume	Depth 0'	12,145	Volume
Depth 1'	3,385	3,103	Depth 1'	13,189	12,667
Depth 2'	3,981	3,683	Depth 2'	14,262	13,726
Depth 3'	4,608	4,295	Depth 3'	15,365	14,814
Depth 4'	5,268	4,938	Depth 4'	16,498	15,932
Depth 5'	5,959	5,614	Depth 5'	17,662	17,080
Depth 6'	6,682	6,321	Depth 6'	18,857	18,260
Depth 7'	Free Board		Depth 7'	20,083	19,470
	Total Volume CF	27,953	Depth 8'	Free Board	
	Total Volume AC-FT	0.64		Total Volume CF	111,947
				Total Volume AC-FT	2.57
Total Volume Retained		3.21			
Peak Flow Mitigation Req'd		2.62	*Including 12" Freeboard*		

Amenities within Basin:

Any amenities proposed within the basin shall have a pervious base which will not negatively impact the percolation rates of the basin system. The basins shall be fully fenced off and shall have an access road to the basin floor to properly maintain the basin performance.

Emergency Overflow System Size Requirements:

Westerly Peak Flow Rate: 17.6 CFS

Overflow Capacity: (150%) **26.4 CFS**

Easterly Peak Flow Rate: 13.0 CFS

Overflow Capacity: (150%) **19.5 CFS**

20th Street Basin Overflow

Rectangular Weir

Crest	= Sharp
Bottom Length (ft)	= 10.00
Total Depth (ft)	= 1.00

Calculations

Weir Coeff. Cw	= 3.33
Compute by:	Known Q
Known Q (cfs)	= 26.40

Highlighted

Depth (ft)	= 0.86
Q (cfs)	= 26.40
Area (sqft)	= 8.57
Velocity (ft/s)	= 3.08
Top Width (ft)	= 10.00

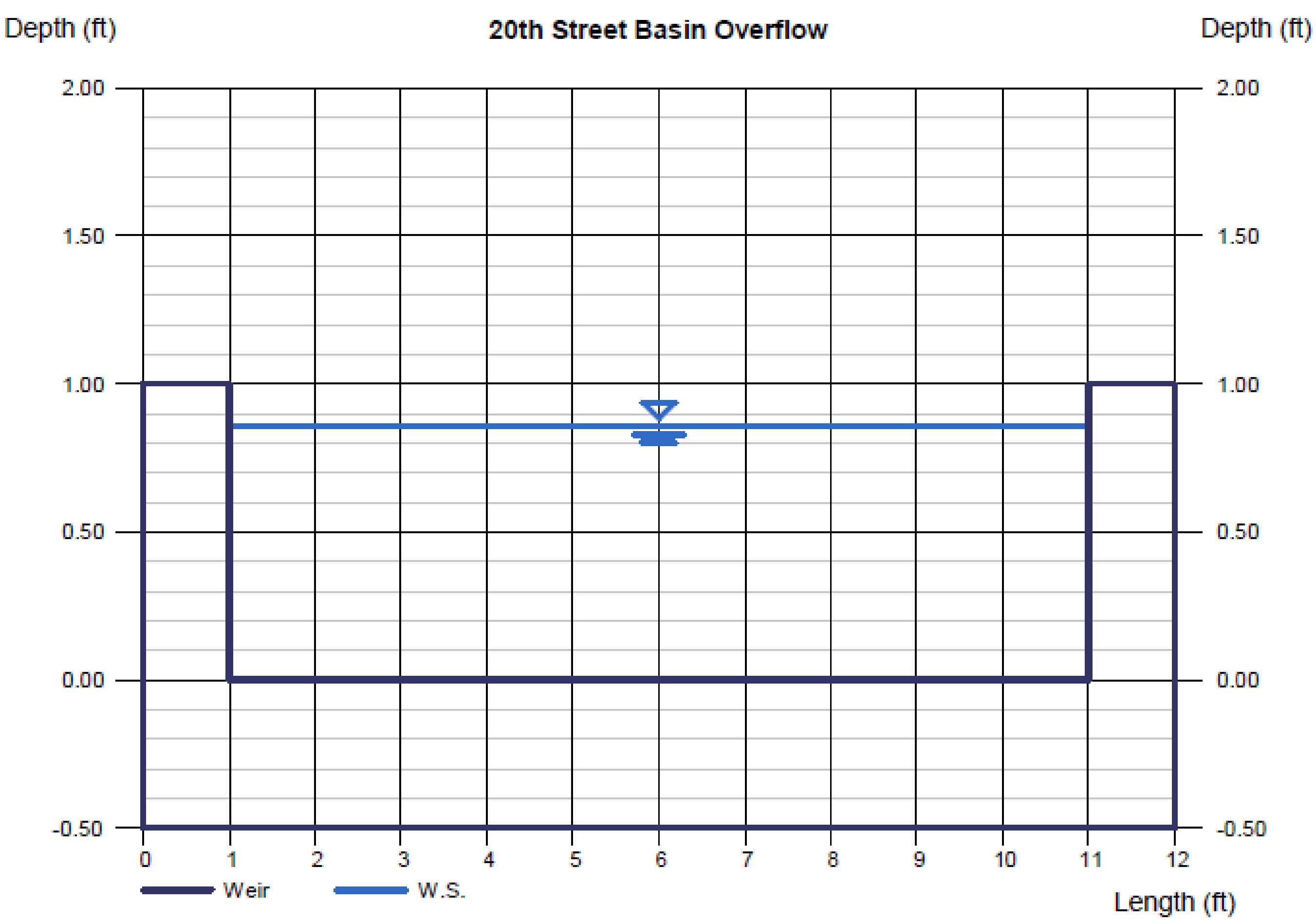


FIGURE 1:

PRE DEVELOPED

ON-SITE TRIBUTARY AREAS

FIGURE 2:

POST DEVELOPED

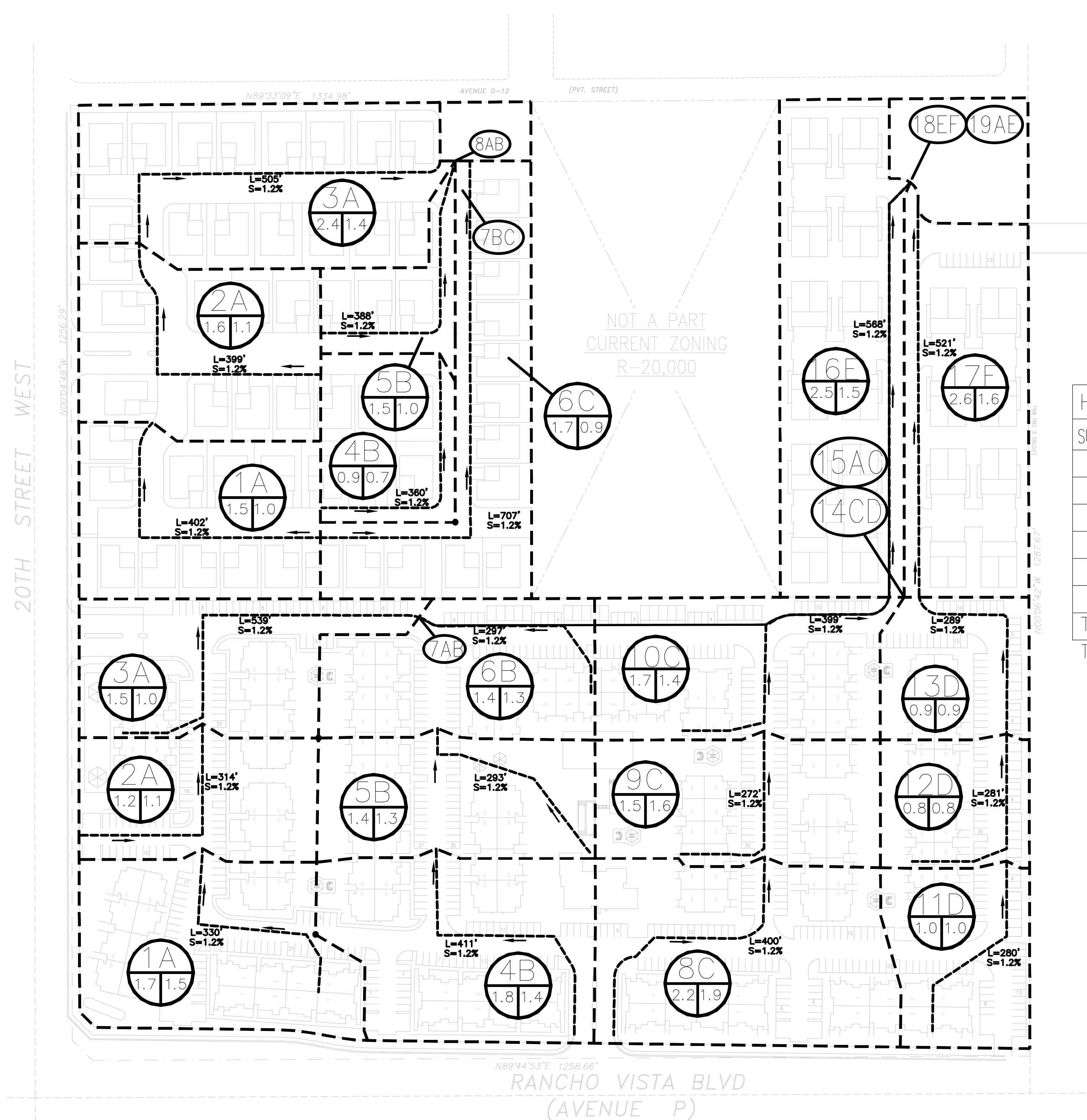
ON-SITE TRIBUTARY AREAS

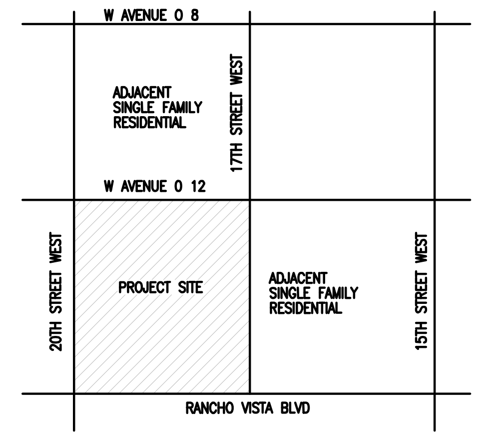
PROJECT DEVELOPER

CAGE PALMDALE LLC

CIVIL ENGINEERS

Duke Engineering
CIVIL & STRUCTURAL
LANCASTER - CALIFORNIA





VICINTY MAP

WESTERLY SECTION

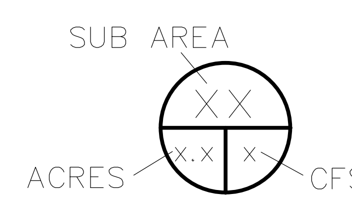
HYDROLOGY ANALYSIS		
SUB-AREA	AREA	CFS
1A	0.9	0.56
2A	1.5	0.89
3A	1.7	0.20
4B	1.5	0.84
5B	1.6	0.95
6C	2.4	1.22
TOTAL	9.6	4.69

TOTAL VOL. 1.17 AC-FT

EASTERLY SECTION

HYDROLOGY ANALYSIS		
SUB-AREA	AREA	CFS
1A	1.7	1.07
2A	1.2	0.80
3A	1.5	0.74
4B	1.8	1.01
5B	1.4	0.94
6B	1.4	0.94
8C	2.2	1.35
9C	1.5	1.11
10C	1.7	1.04
11D	1.0	0.74
12D	0.8	0.59
13D	0.9	0.66
16E	2.5	1.28
17F	2.6	1.38
TOTAL	22.2	13.7

TOTAL VOL. 2.77 AC-FT



Sheet Title

POST DEVELOPED HYDROLOGY MAP

Drawn By: DUKE

Checked By: DUKE

Project No. 17070

Sheet

FIGURE-2

FIGURE 3:

ON SITE SUB-AREA RUNOFF CALCULATIONS

project (EAST)	subarea	area	length	slope	depth	imperviousness	soil	frequency	fire	cfs	ac-ft
20th Street Condos	1A	1.7	330	0.012	4.0	0.4	134	25-YR	0	1.0715	0.2079
20th Street Condos	2A	1.2	314	0.012	4.0	0.4	134	25-YR	0	0.806	0.1469
20th Street Condos	3A	1.5	539	0.012	4.0	0.4	134	25-YR	0	0.7427	0.1829
20th Street Condos	4B	1.8	411	0.012	4.0	0.4	134	25-YR	0	1.0146	0.2197
20th Street Condos	5B	1.4	293	0.012	4.0	0.4	134	25-YR	0	0.9403	0.1714
20th Street Condos	6B	1.4	297	0.012	4.0	0.4	134	25-YR	0	0.9403	0.1714
20th Street Condos	8C	2.2	400	0.012	4.0	0.42	134	25-YR	0	1.3529	0.279
20th Street Condos	9C	1.5	272	0.012	4.0	0.42	134	25-YR	0	1.1127	0.1908
20th Street Condos	10C	1.7	399	0.012	4.0	0.42	134	25-YR	0	1.0454	0.2156
20th Street Condos	11D	1.0	280	0.012	4.0	0.42	134	25-YR	0	0.7418	0.1272
20th Street Condos	12D	0.8	281	0.012	4.0	0.42	134	25-YR	0	0.5935	0.1018
20th Street Condos	13D	0.9	289	0.012	4.0	0.42	134	25-YR	0	0.6676	0.1145
20th Street Condos	16E	2.5	568	0.012	4.0	0.42	124	25-YR	0	1.285	0.3164
20th Street Condos	17F	2.6	521	0.012	4.0	0.42	124	25-YR	0	1.875	0.329
		22.2								14.1893	2.7745

project (WEST)	subarea	area	length	slope	depth	imperviousness	soil	frequency	fire	cfs	ac-ft
20th Street Condos	1A	0.9	360	0.012	4.0	0.4	124	25-YR	0	0.5055	0.1101
20th Street Condos	2A	1.5	388	0.012	4.0	0.4	124	25-YR	0	0.8136	0.1832
20th Street Condos	3A	1.7	707	0.012	4.0	0.4	124	25-YR	0	0.7798	0.2072
20th Street Condos	4B	1.5	402	0.012	4.0	0.4	124	25-YR	0	0.8136	0.1831
20th Street Condos	5B	1.6	399	0.012	4.0	0.4	124	25-YR	0	0.8679	0.1955
20th Street Condos	6C	2.4	505	0.012	4.0	0.4	124	25-YR	0	1.2226	0.2926
		9.6								5.003	1.1717
PRE DEV						0					

project (WEST)	subarea	area	length	slope	depth	imperviousness	soil	frequency	fire	cfs	ac-ft
20th Street Condos	1A	9.2	782	0.015	4	0.1	134	25-YR	0	1.4948	0.4807
20th Street Condos	2A	3.3	565	0.015	4	0.1	134	25-YR	0	0.5362	0.1724
20th Street Condos	1B	2.7	677	0.015	4	0.1	134	25-YR	0	0.4387	0.1411
20th Street Condos	2B	3.9	519	0.015	4	0.1	134	25-YR	0	0.6546	0.2038
		19.1								3.1243	0.998

project (EAST)	subarea	area	length	slope	depth	imperviousness	soil	frequency	fire	cfs	ac-ft
20th Street Condos	1A	6.7	813	0.011	4	0.1	134	25-YR	0	1.0866	0.35
20th Street Condos	2A	3.3	931	0.006	4	0.1	134	25-YR	0	0.5362	0.1724
20th Street Condos	3A	2.7	697	0.011	4	0.1	134	25-YR	0	0.4387	0.1411
		12.7								2.0615	0.6635

NEW PRE DEVELOPED	EAST	WEST	
	0.6635	0.998	AC-FT
	85%	85%	
	0.563975	0.8483	AC-FT
NEW POST DEVELOPED	EAST	WEST	
	2.7745	1.1717	AC-FT

TOTAL

EAST		**WEST**	
ΔV		**ΔV**	
	2.2105		**0.3234**

Peak Flow Hydrologic Analysis

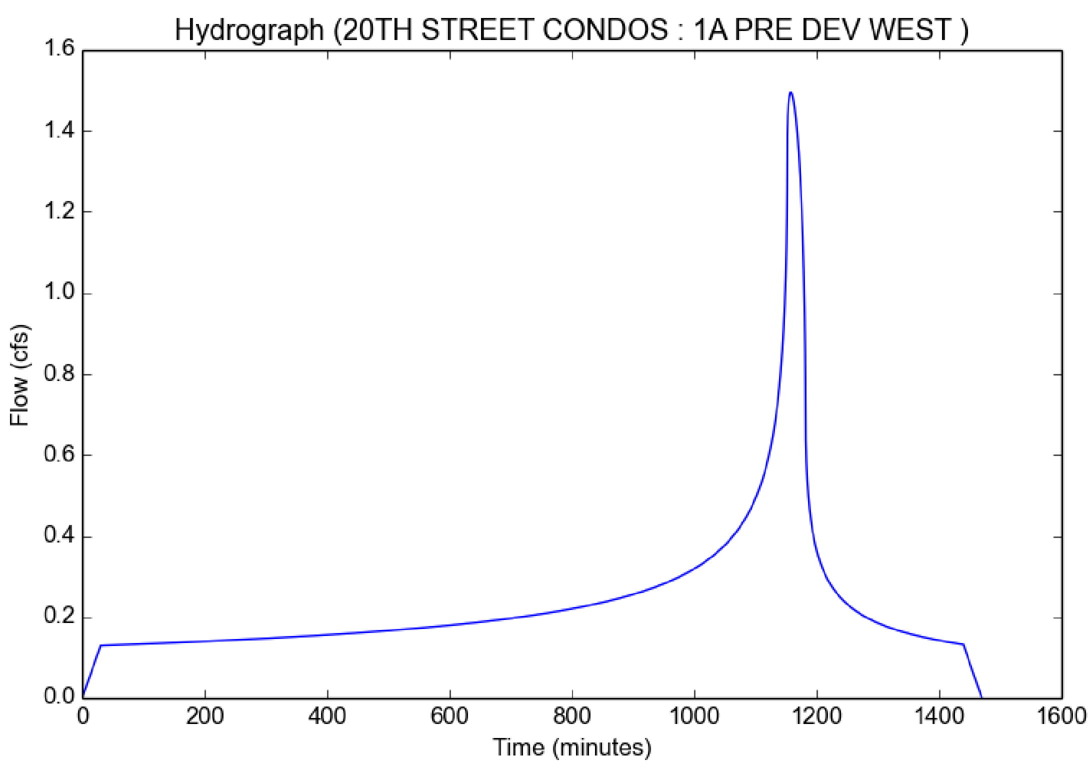
File location: C:/Users/Ryan Duke/Desktop/20TH STREET CONDOS/PRE DEV/20TH STREET CONDOS - 1A PRE DEV WEST.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	20TH STREET CONDOS
Subarea ID	1A PRE DEV WEST
Area (ac)	9.2
Flow Path Length (ft)	782.0
Flow Path Slope (vft/hft)	0.015
50-yr Rainfall Depth (in)	4.0
Percent Impervious	0.1
Soil Type	134
Design Storm Frequency	25-yr
Fire Factor	0
LID	False

Output Results

Modeled (25-yr) Rainfall Depth (in)	3.512
Peak Intensity (in/hr)	0.9027
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.18
Time of Concentration (min)	30.0
Clear Peak Flow Rate (cfs)	1.4948
Burned Peak Flow Rate (cfs)	1.4948
24-Hr Clear Runoff Volume (ac-ft)	0.4807
24-Hr Clear Runoff Volume (cu-ft)	20937.3796



Peak Flow Hydrologic Analysis

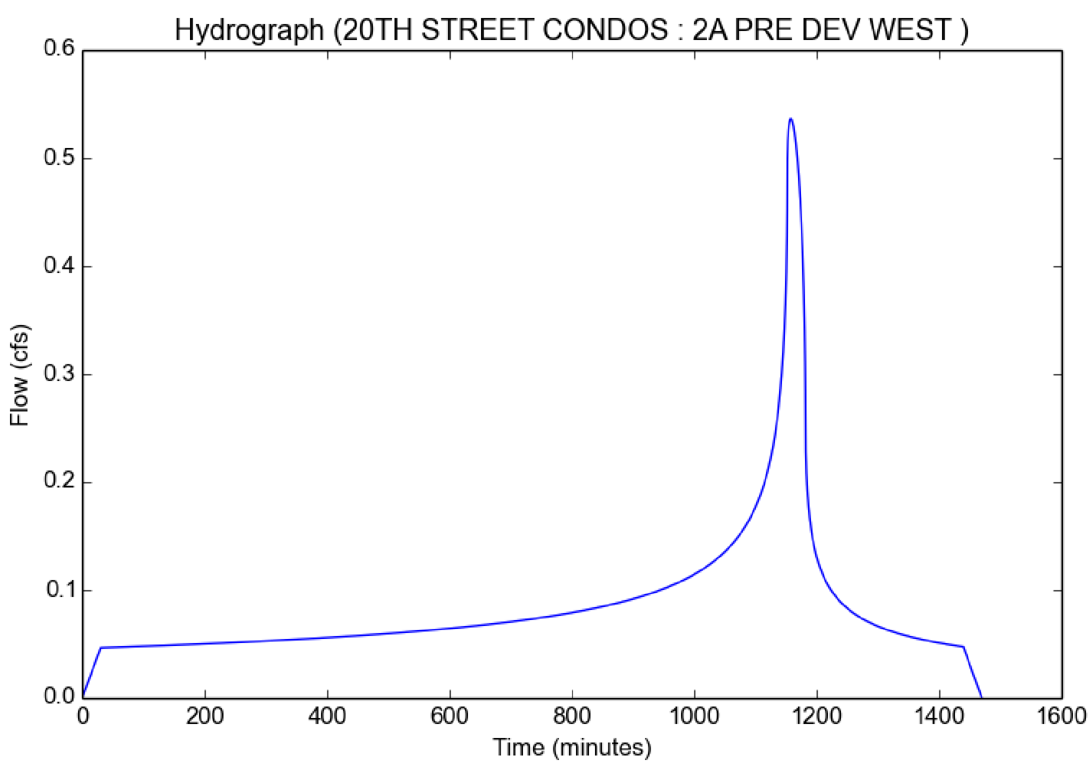
File location: C:/Users/Ryan Duke/Desktop/20TH STREET CONDOS/PRE DEV/20TH STREET CONDOS - 2A PRE DEV WEST.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	20TH STREET CONDOS
Subarea ID	2A PRE DEV WEST
Area (ac)	3.3
Flow Path Length (ft)	565.0
Flow Path Slope (vft/hft)	0.015
50-yr Rainfall Depth (in)	4.0
Percent Impervious	0.1
Soil Type	134
Design Storm Frequency	25-yr
Fire Factor	0
LID	False

Output Results

Modeled (25-yr) Rainfall Depth (in)	3.512
Peak Intensity (in/hr)	0.9027
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.18
Time of Concentration (min)	30.0
Clear Peak Flow Rate (cfs)	0.5362
Burned Peak Flow Rate (cfs)	0.5362
24-Hr Clear Runoff Volume (ac-ft)	0.1724
24-Hr Clear Runoff Volume (cu-ft)	7510.147



Peak Flow Hydrologic Analysis

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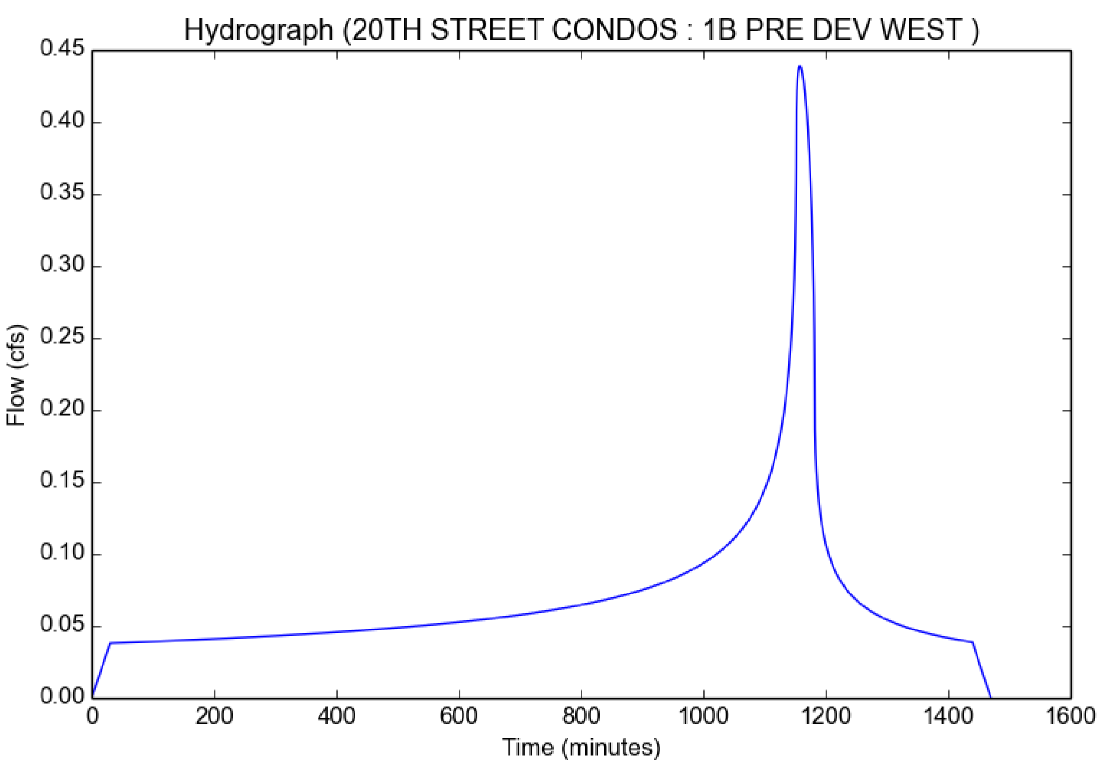
Version: HydroCalc 1.0.3

Input Parameters

Project Name	20TH STREET CONDOS
Subarea ID	1B PRE DEV WEST
Area (ac)	2.7
Flow Path Length (ft)	677.0
Flow Path Slope (vft/hft)	0.015
50-yr Rainfall Depth (in)	4.0
Percent Impervious	0.1
Soil Type	134
Design Storm Frequency	25-yr
Fire Factor	0
LID	False

Output Results

Modeled (25-yr) Rainfall Depth (in)	3.512
Peak Intensity (in/hr)	0.9027
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.18
Time of Concentration (min)	30.0
Clear Peak Flow Rate (cfs)	0.4387
Burned Peak Flow Rate (cfs)	0.4387
24-Hr Clear Runoff Volume (ac-ft)	0.1411
24-Hr Clear Runoff Volume (cu-ft)	6144.6657



Peak Flow Hydrologic Analysis

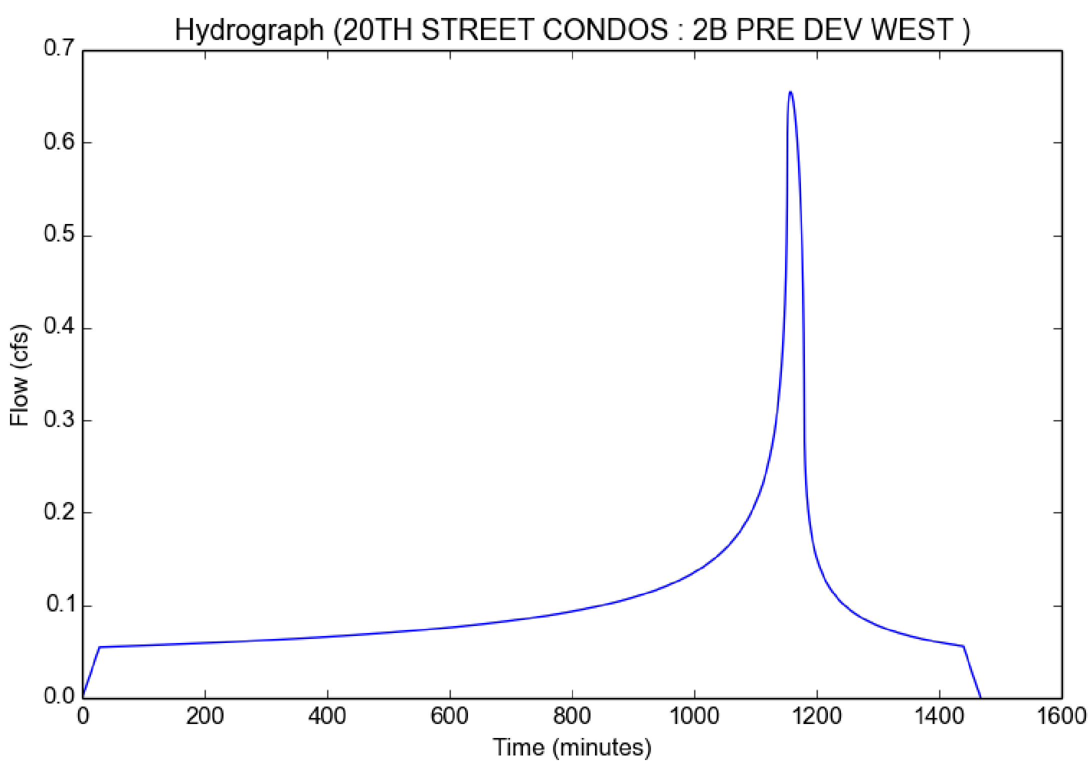
File location: C:/Users/Ryan Duke/Desktop/20TH STREET CONDOS/PRE DEV/20TH STREET CONDOS - 2B PRE DEV WEST.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	20TH STREET CONDOS
Subarea ID	2B PRE DEV WEST
Area (ac)	3.9
Flow Path Length (ft)	519.0
Flow Path Slope (vft/hft)	0.015
50-yr Rainfall Depth (in)	4.0
Percent Impervious	0.1
Soil Type	134
Design Storm Frequency	25-yr
Fire Factor	0
LID	False

Output Results

Modeled (25-yr) Rainfall Depth (in)	3.512
Peak Intensity (in/hr)	0.9324
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.18
Time of Concentration (min)	28.0
Clear Peak Flow Rate (cfs)	0.6546
Burned Peak Flow Rate (cfs)	0.6546
24-Hr Clear Runoff Volume (ac-ft)	0.2038
24-Hr Clear Runoff Volume (cu-ft)	8875.6151



Peak Flow Hydrologic Analysis

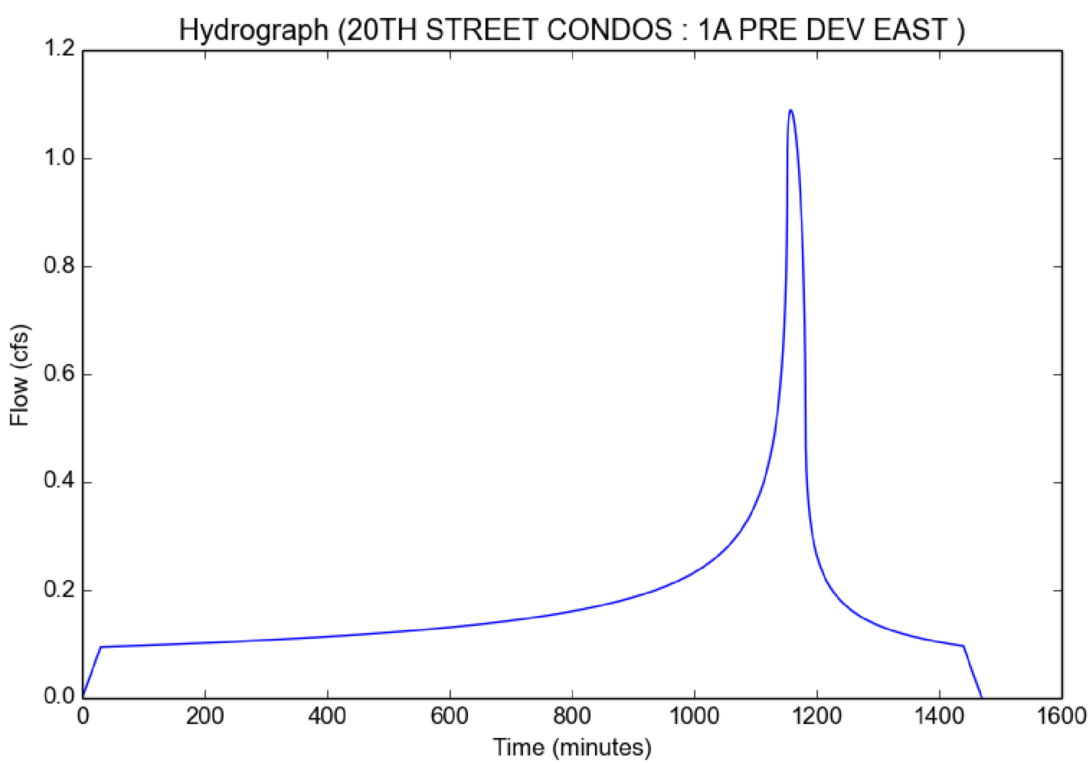
File location: C:/Users/Ryan Duke/Desktop/20TH STREET CONDOS/PRE DEV/20TH STREET CONDOS - 1A PRE DEV EAST.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	20TH STREET CONDOS
Subarea ID	1A PRE DEV EAST
Area (ac)	6.7
Flow Path Length (ft)	813.0
Flow Path Slope (vft/hft)	0.011
50-yr Rainfall Depth (in)	4.0
Percent Impervious	0.1
Soil Type	134
Design Storm Frequency	25-yr
Fire Factor	0
LID	False

Output Results

Modeled (25-yr) Rainfall Depth (in)	3.512
Peak Intensity (in/hr)	0.9027
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.18
Time of Concentration (min)	30.0
Clear Peak Flow Rate (cfs)	1.0886
Burned Peak Flow Rate (cfs)	1.0886
24-Hr Clear Runoff Volume (ac-ft)	0.35
24-Hr Clear Runoff Volume (cu-ft)	15247.8743



Peak Flow Hydrologic Analysis

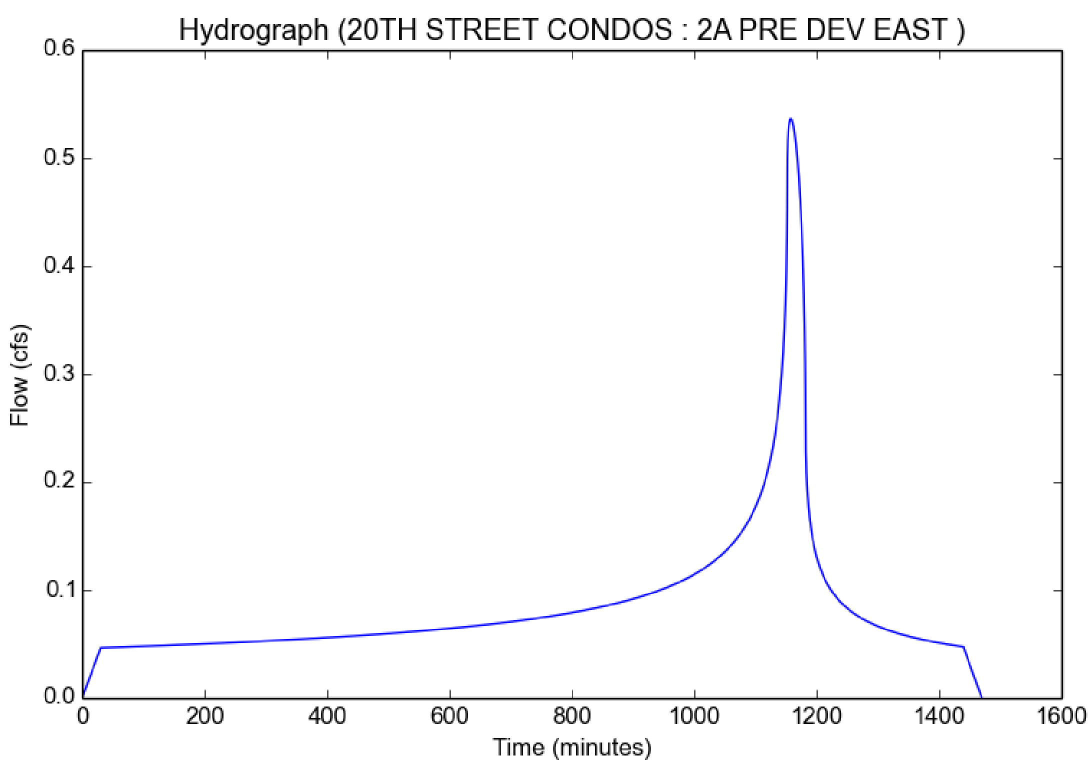
File location: C:/Users/Ryan Duke/Desktop/20TH STREET CONDOS/PRE DEV/20TH STREET CONDOS - 2A PRE DEV EAST.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	20TH STREET CONDOS
Subarea ID	2A PRE DEV EAST
Area (ac)	3.3
Flow Path Length (ft)	931.0
Flow Path Slope (vft/hft)	0.006
50-yr Rainfall Depth (in)	4.0
Percent Impervious	0.1
Soil Type	134
Design Storm Frequency	25-yr
Fire Factor	0
LID	False

Output Results

Modeled (25-yr) Rainfall Depth (in)	3.512
Peak Intensity (in/hr)	0.9027
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.18
Time of Concentration (min)	30.0
Clear Peak Flow Rate (cfs)	0.5362
Burned Peak Flow Rate (cfs)	0.5362
24-Hr Clear Runoff Volume (ac-ft)	0.1724
24-Hr Clear Runoff Volume (cu-ft)	7510.147



Peak Flow Hydrologic Analysis

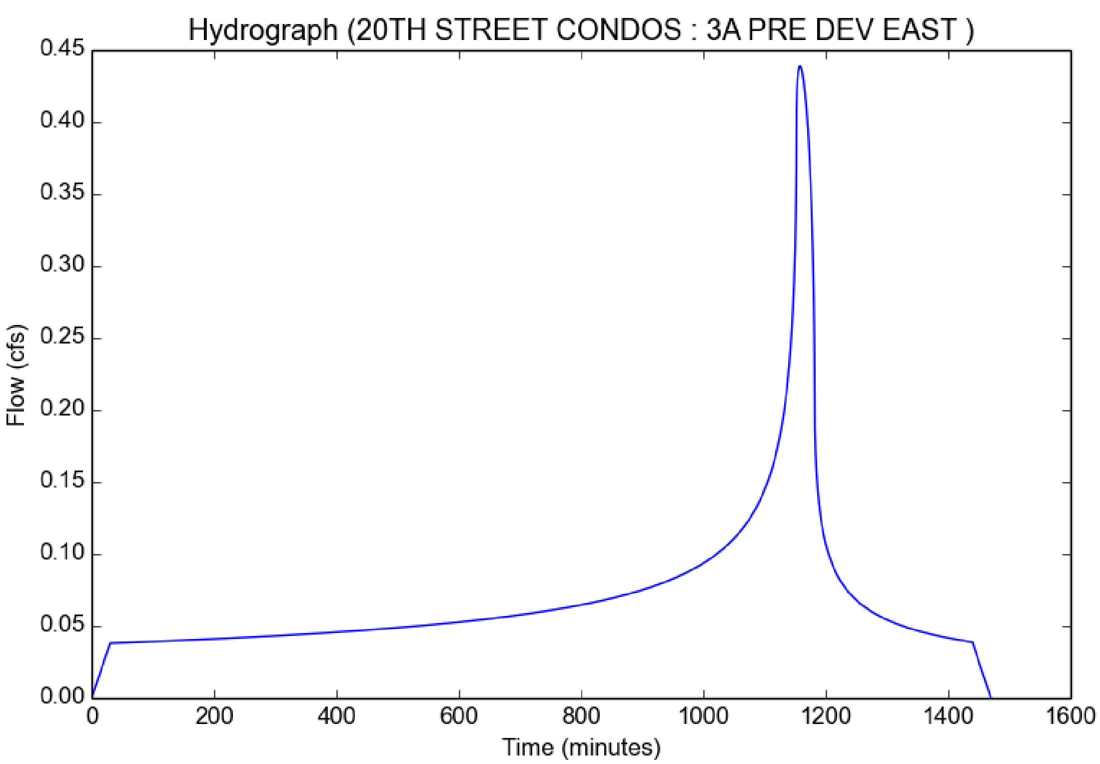
File location: C:/Users/Ryan Duke/Desktop/20TH STREET CONDOS/PRE DEV/20TH STREET CONDOS - 3A PRE DEV EAST.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	20TH STREET CONDOS
Subarea ID	3A PRE DEV EAST
Area (ac)	2.7
Flow Path Length (ft)	697.0
Flow Path Slope (vft/hft)	0.011
50-yr Rainfall Depth (in)	4.0
Percent Impervious	0.1
Soil Type	134
Design Storm Frequency	25-yr
Fire Factor	0
LID	False

Output Results

Modeled (25-yr) Rainfall Depth (in)	3.512
Peak Intensity (in/hr)	0.9027
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.18
Time of Concentration (min)	30.0
Clear Peak Flow Rate (cfs)	0.4387
Burned Peak Flow Rate (cfs)	0.4387
24-Hr Clear Runoff Volume (ac-ft)	0.1411
24-Hr Clear Runoff Volume (cu-ft)	6144.6657



Peak Flow Hydrologic Analysis

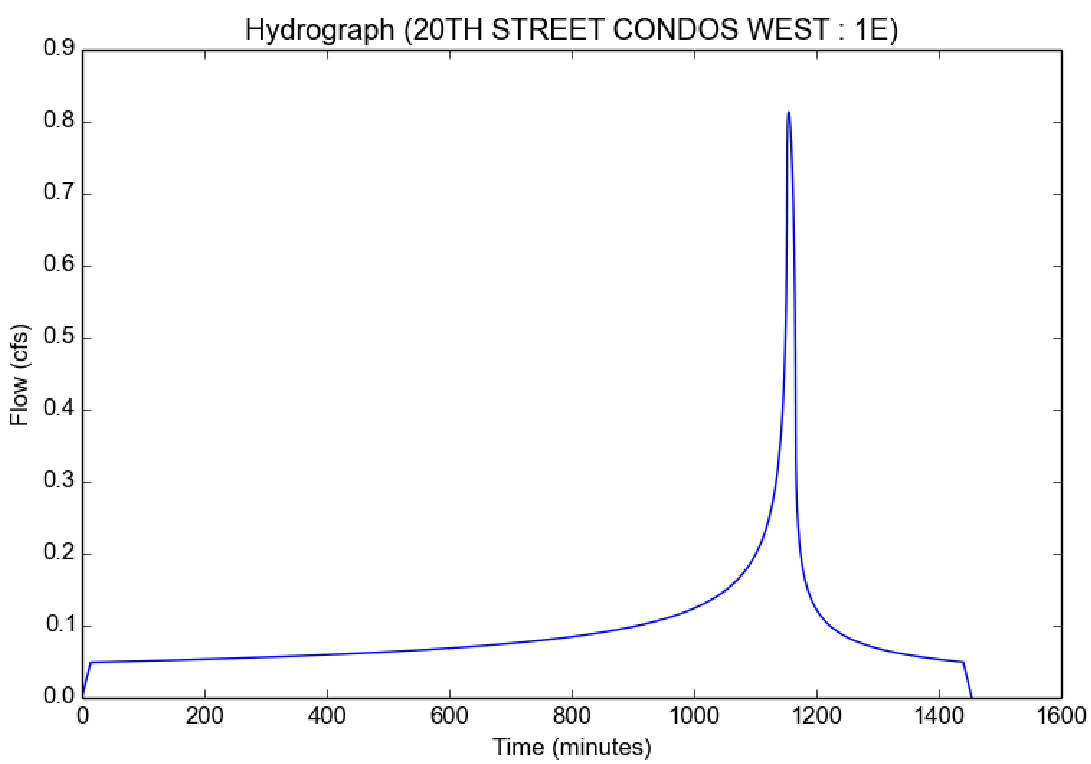
File location: C:/Users/Ryan Duke/Desktop/20TH STREET CONDOS/UPDATED/20TH STREET CONDOS WEST - 1E.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	20TH STREET CONDOS WEST
Subarea ID	1A
Area (ac)	1.5
Flow Path Length (ft)	402.0
Flow Path Slope (vft/hft)	0.012
50-yr Rainfall Depth (in)	4.0
Percent Impervious	0.4
Soil Type	124
Design Storm Frequency	25-yr
Fire Factor	0
LID	False

Output Results

Modeled (25-yr) Rainfall Depth (in)	3.512
Peak Intensity (in/hr)	1.2915
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.42
Time of Concentration (min)	14.0
Clear Peak Flow Rate (cfs)	0.8136
Burned Peak Flow Rate (cfs)	0.8136
24-Hr Clear Runoff Volume (ac-ft)	0.1829
24-Hr Clear Runoff Volume (cu-ft)	7965.2357



Peak Flow Hydrologic Analysis

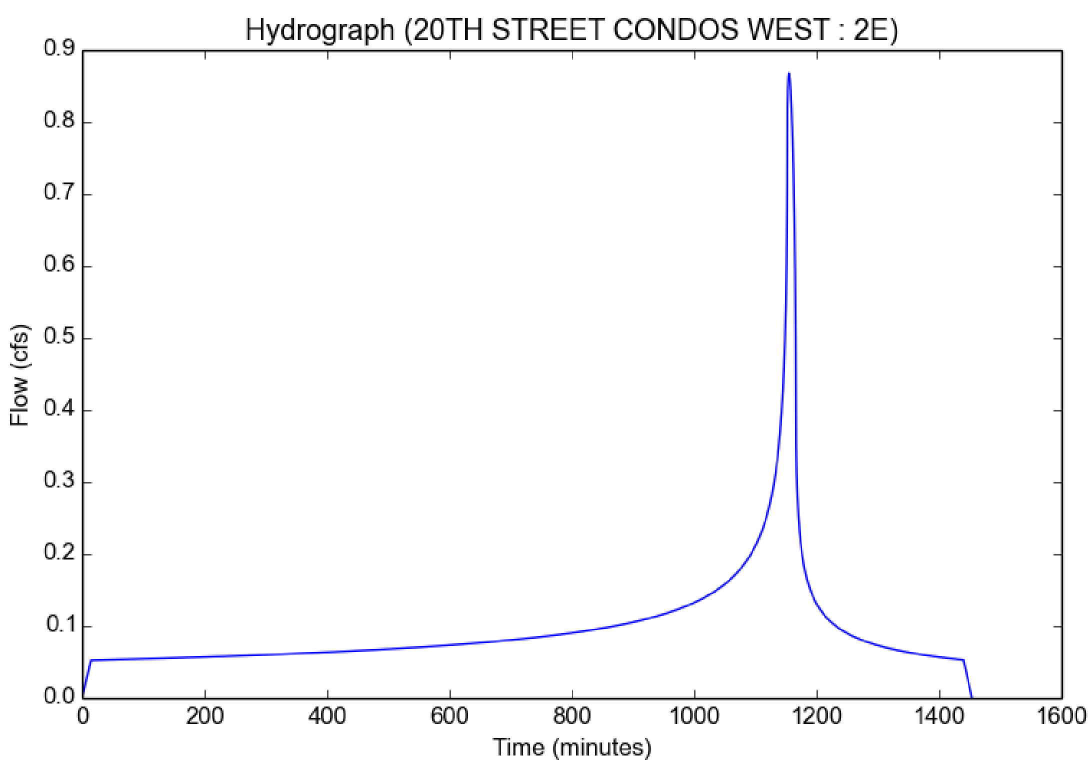
File location: C:/Users/Ryan Duke/Desktop/20TH STREET CONDOS/UPDATED/20TH STREET CONDOS WEST - 2E.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	20TH STREET CONDOS WEST
Subarea ID	2A
Area (ac)	1.6
Flow Path Length (ft)	399.0
Flow Path Slope (vft/hft)	0.012
50-yr Rainfall Depth (in)	4.0
Percent Impervious	0.4
Soil Type	124
Design Storm Frequency	25-yr
Fire Factor	0
LID	False

Output Results

Modeled (25-yr) Rainfall Depth (in)	3.512
Peak Intensity (in/hr)	1.2915
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.42
Time of Concentration (min)	14.0
Clear Peak Flow Rate (cfs)	0.8679
Burned Peak Flow Rate (cfs)	0.8679
24-Hr Clear Runoff Volume (ac-ft)	0.195
24-Hr Clear Runoff Volume (cu-ft)	8496.2514



Peak Flow Hydrologic Analysis

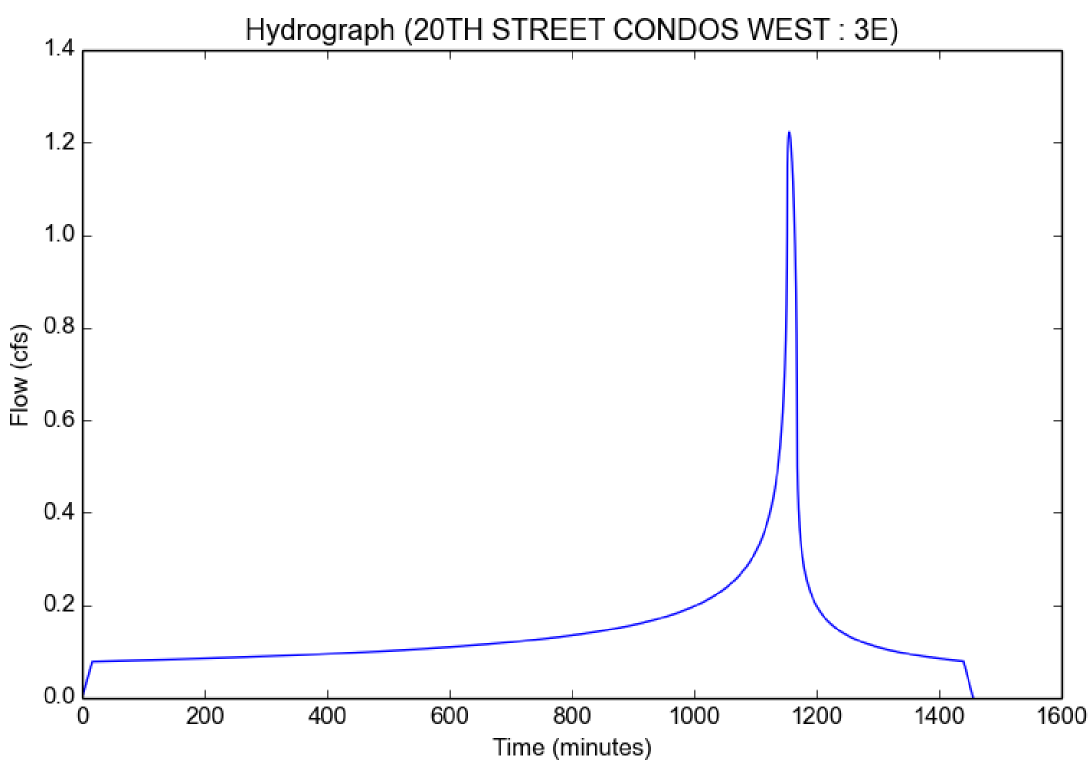
File location: C:/Users/Ryan Duke/Desktop/20TH STREET CONDOS/UPDATED/20TH STREET CONDOS WEST - 3E.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	20TH STREET CONDOS WEST
Subarea ID	3A
Area (ac)	2.4
Flow Path Length (ft)	505.0
Flow Path Slope (vft/hft)	0.012
50-yr Rainfall Depth (in)	4.0
Percent Impervious	0.4
Soil Type	124
Design Storm Frequency	25-yr
Fire Factor	0
LID	False

Output Results

Modeled (25-yr) Rainfall Depth (in)	3.512
Peak Intensity (in/hr)	1.2129
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.42
Time of Concentration (min)	16.0
Clear Peak Flow Rate (cfs)	1.2226
Burned Peak Flow Rate (cfs)	1.2226
24-Hr Clear Runoff Volume (ac-ft)	0.2926
24-Hr Clear Runoff Volume (cu-ft)	12744.3868



Peak Flow Hydrologic Analysis

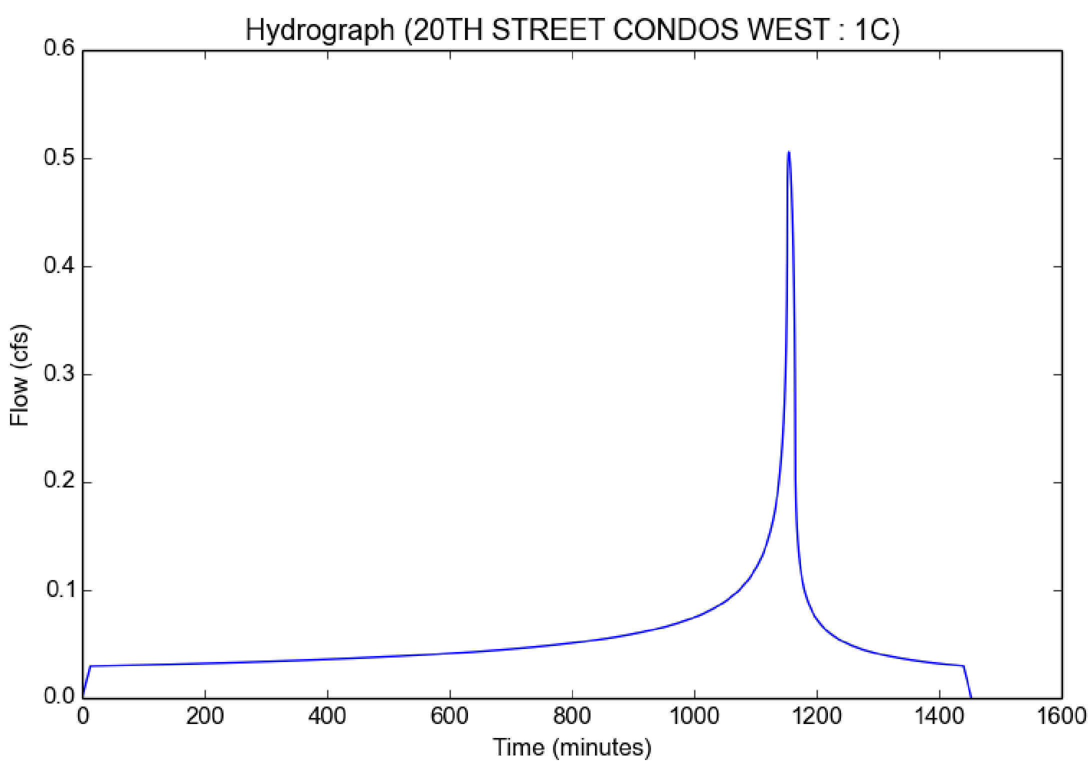
File location: C:/Users/Ryan Duke/Desktop/20TH STREET CONDOS/UPDATED/20TH STREET CONDOS WEST - 1C.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	20TH STREET CONDOS WEST
Subarea ID	4B
Area (ac)	0.9
Flow Path Length (ft)	360.0
Flow Path Slope (vft/hft)	0.012
50-yr Rainfall Depth (in)	4.0
Percent Impervious	0.4
Soil Type	124
Design Storm Frequency	25-yr
Fire Factor	0
LID	False

Output Results

Modeled (25-yr) Rainfall Depth (in)	3.512
Peak Intensity (in/hr)	1.3373
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.42
Time of Concentration (min)	13.0
Clear Peak Flow Rate (cfs)	0.5055
Burned Peak Flow Rate (cfs)	0.5055
24-Hr Clear Runoff Volume (ac-ft)	0.1097
24-Hr Clear Runoff Volume (cu-ft)	4779.1398



Peak Flow Hydrologic Analysis

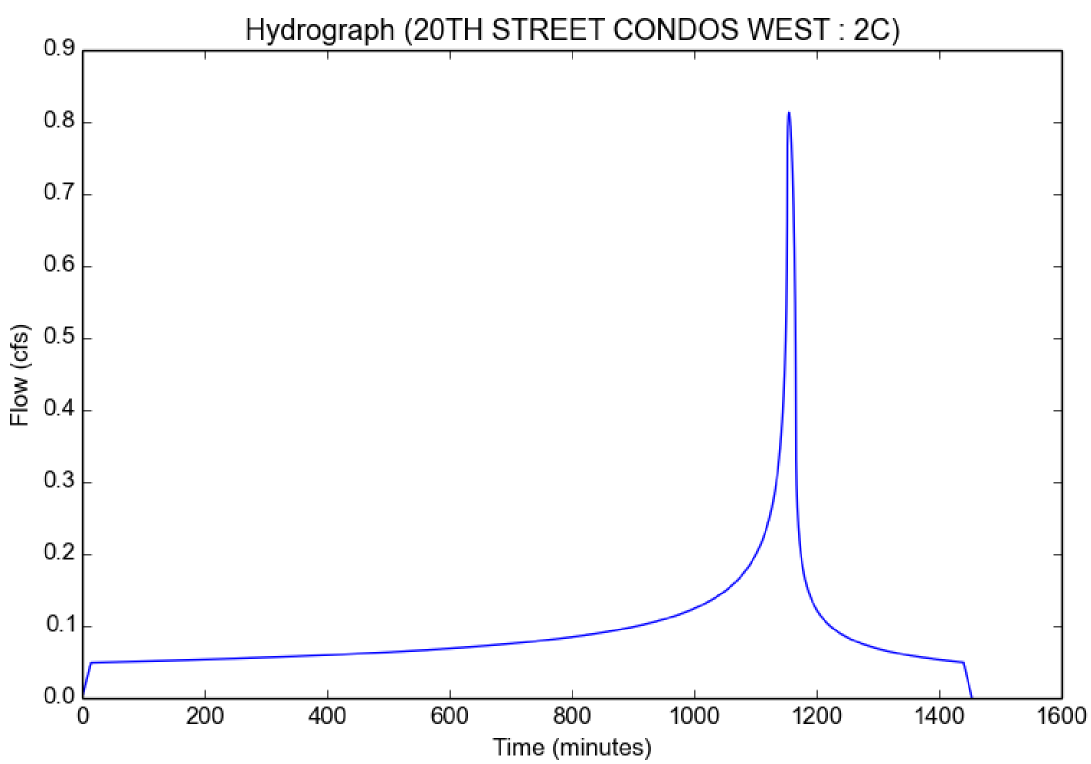
File location: C:/Users/Ryan Duke/Desktop/20TH STREET CONDOS/UPDATED/20TH STREET CONDOS WEST - 2C.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	20TH STREET CONDOS WEST
Subarea ID	5B
Area (ac)	1.5
Flow Path Length (ft)	388.0
Flow Path Slope (vft/hft)	0.012
50-yr Rainfall Depth (in)	4.0
Percent Impervious	0.4
Soil Type	124
Design Storm Frequency	25-yr
Fire Factor	0
LID	False

Output Results

Modeled (25-yr) Rainfall Depth (in)	3.512
Peak Intensity (in/hr)	1.2915
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.42
Time of Concentration (min)	14.0
Clear Peak Flow Rate (cfs)	0.8136
Burned Peak Flow Rate (cfs)	0.8136
24-Hr Clear Runoff Volume (ac-ft)	0.1829
24-Hr Clear Runoff Volume (cu-ft)	7965.2357



Peak Flow Hydrologic Analysis

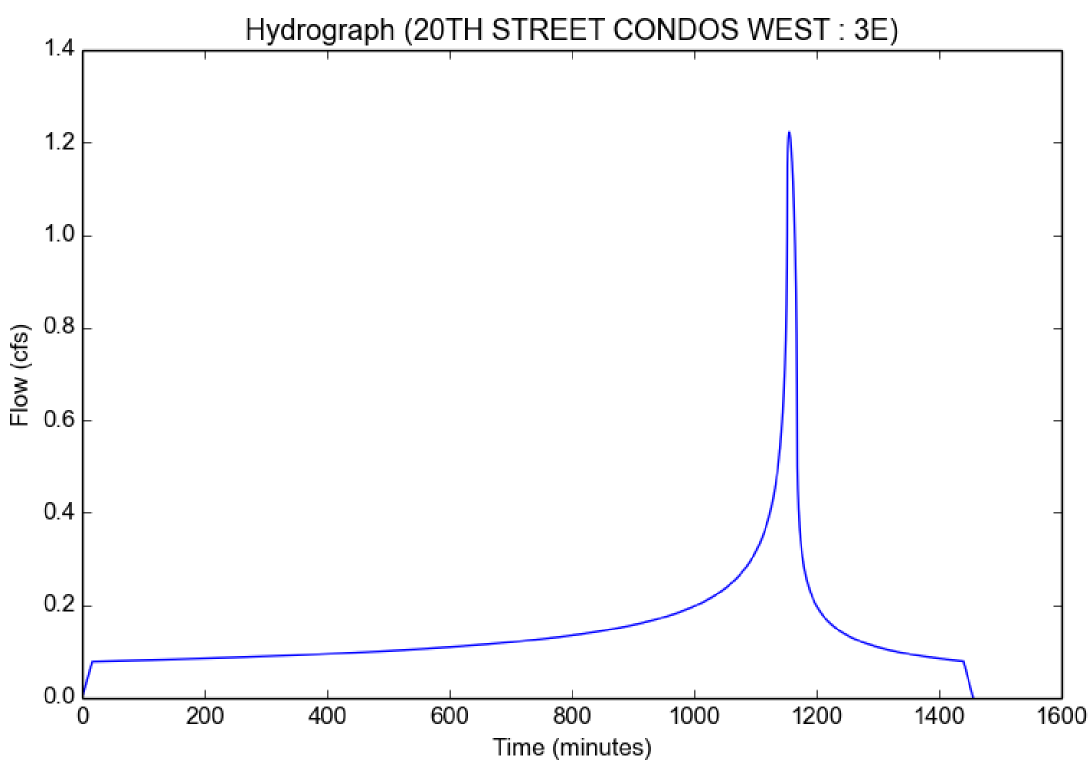
File location: C:/Users/Ryan Duke/Desktop/20TH STREET CONDOS/UPDATED/20TH STREET CONDOS WEST - 3E.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	20TH STREET CONDOS WEST
Subarea ID	6C
Area (ac)	2.4
Flow Path Length (ft)	505.0
Flow Path Slope (vft/hft)	0.012
50-yr Rainfall Depth (in)	4.0
Percent Impervious	0.4
Soil Type	124
Design Storm Frequency	25-yr
Fire Factor	0
LID	False

Output Results

Modeled (25-yr) Rainfall Depth (in)	3.512
Peak Intensity (in/hr)	1.2129
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.42
Time of Concentration (min)	16.0
Clear Peak Flow Rate (cfs)	1.2226
Burned Peak Flow Rate (cfs)	1.2226
24-Hr Clear Runoff Volume (ac-ft)	0.2926
24-Hr Clear Runoff Volume (cu-ft)	12744.3868



Peak Flow Hydrologic Analysis

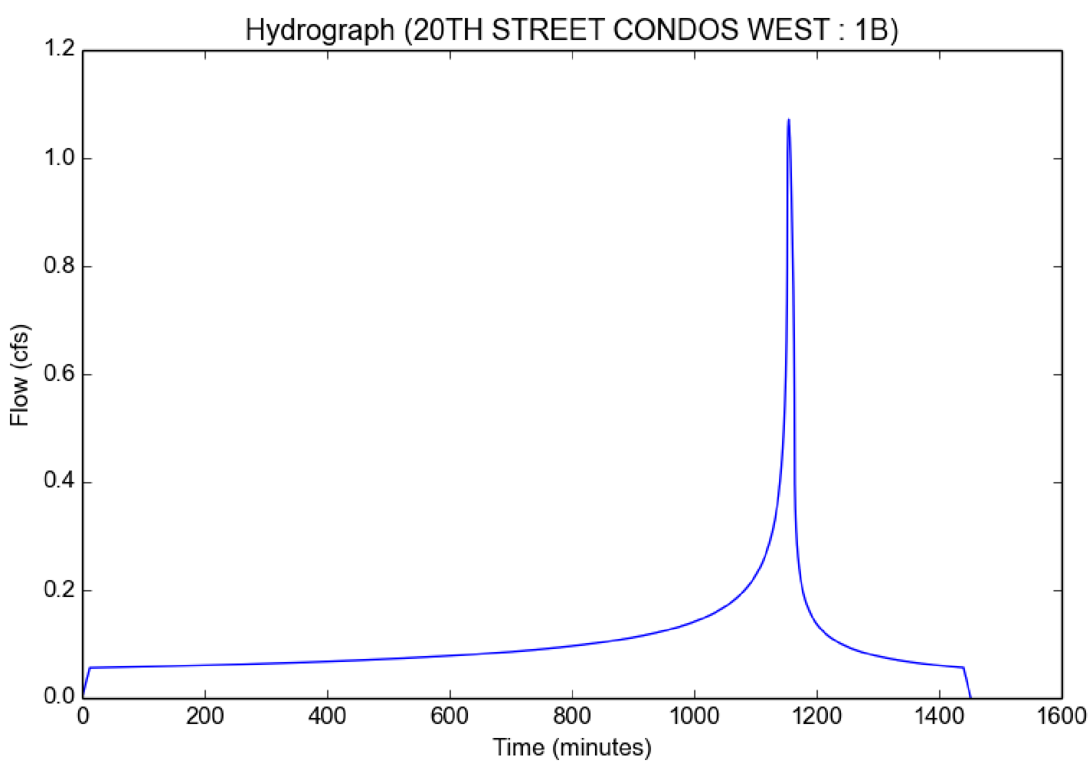
File location: C:/Users/Ryan Duke/Desktop/20TH STREET CONDOS/UPDATED/20TH STREET CONDOS WEST - 1B.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	20TH STREET CONDOS WEST
Subarea ID	1A
Area (ac)	1.7
Flow Path Length (ft)	330.0
Flow Path Slope (vft/hft)	0.012
50-yr Rainfall Depth (in)	4.0
Percent Impervious	0.4
Soil Type	134
Design Storm Frequency	25-yr
Fire Factor	0
LID	False

Output Results

Modeled (25-yr) Rainfall Depth (in)	3.512
Peak Intensity (in/hr)	1.3885
Undeveloped Runoff Coefficient (Cu)	0.1565
Developed Runoff Coefficient (Cd)	0.4539
Time of Concentration (min)	12.0
Clear Peak Flow Rate (cfs)	1.0715
Burned Peak Flow Rate (cfs)	1.0715
24-Hr Clear Runoff Volume (ac-ft)	0.2079
24-Hr Clear Runoff Volume (cu-ft)	9055.4947



Peak Flow Hydrologic Analysis

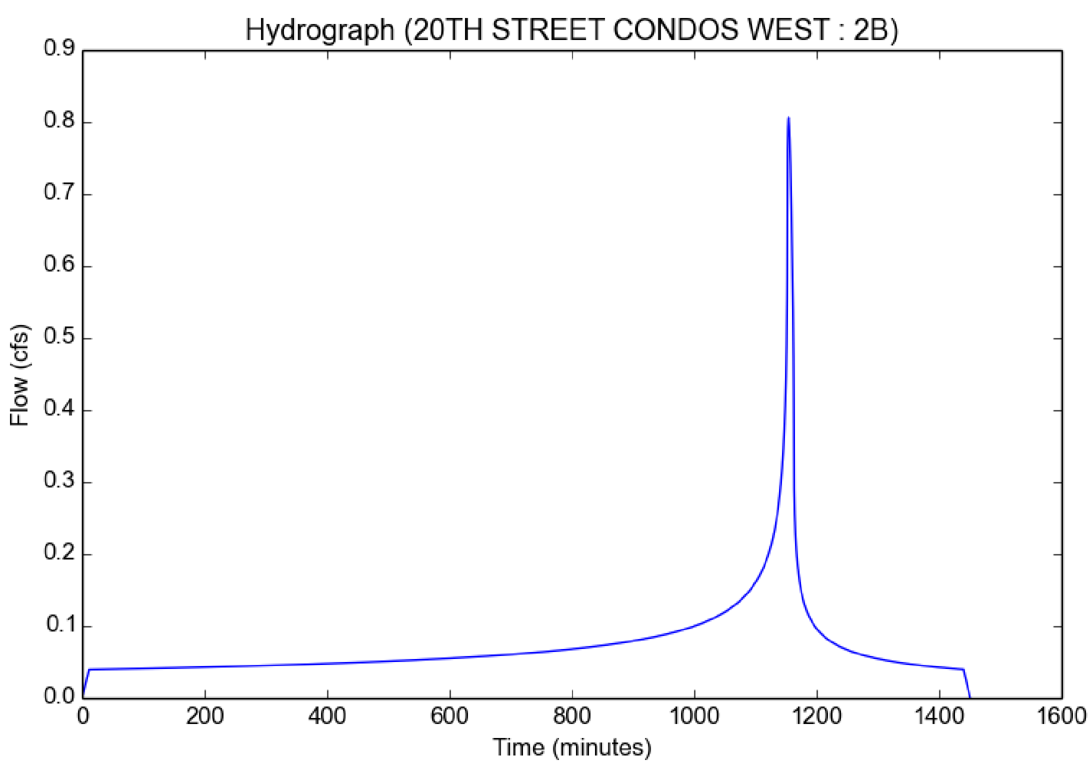
File location: C:/Users/Ryan Duke/Desktop/20TH STREET CONDOS/UPDATED/20TH STREET CONDOS WEST - 2B.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	20TH STREET CONDOS WEST
Subarea ID	2A
Area (ac)	1.2
Flow Path Length (ft)	314.0
Flow Path Slope (vft/hft)	0.012
50-yr Rainfall Depth (in)	4.0
Percent Impervious	0.4
Soil Type	134
Design Storm Frequency	25-yr
Fire Factor	0
LID	False

Output Results

Modeled (25-yr) Rainfall Depth (in)	3.512
Peak Intensity (in/hr)	1.4465
Undeveloped Runoff Coefficient (Cu)	0.1739
Developed Runoff Coefficient (Cd)	0.4643
Time of Concentration (min)	11.0
Clear Peak Flow Rate (cfs)	0.806
Burned Peak Flow Rate (cfs)	0.806
24-Hr Clear Runoff Volume (ac-ft)	0.1469
24-Hr Clear Runoff Volume (cu-ft)	6399.3046



Peak Flow Hydrologic Analysis

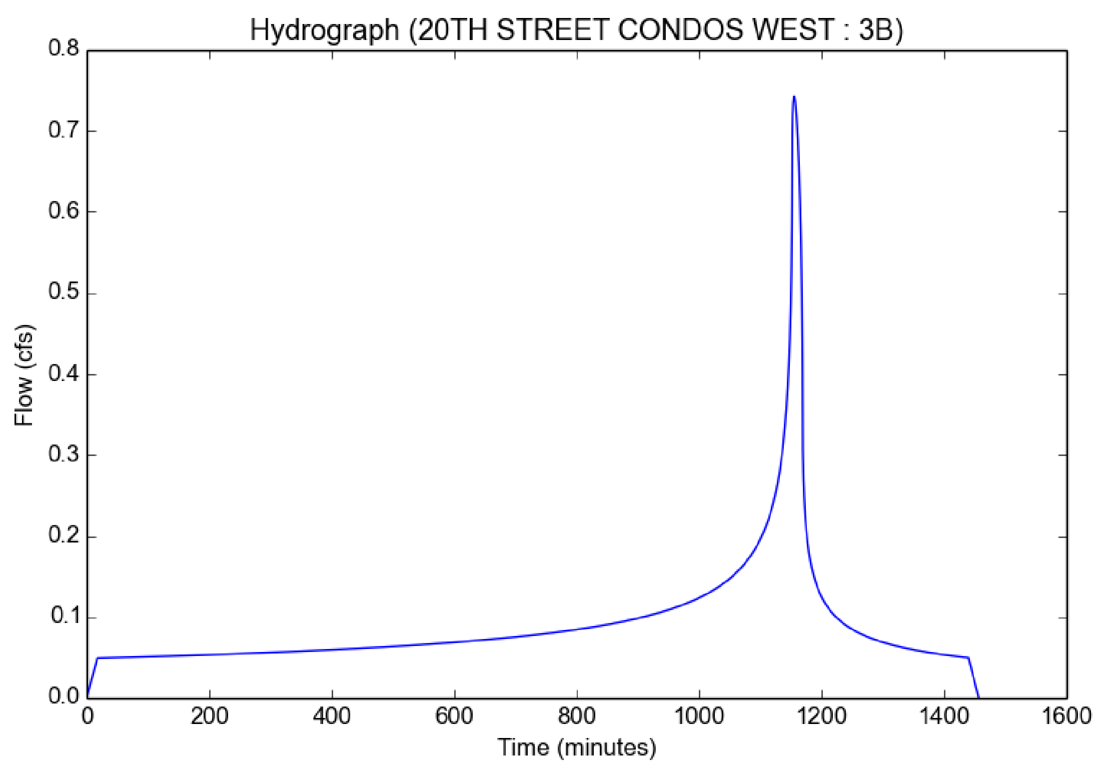
File location: C:/Users/Ryan Duke/Desktop/20TH STREET CONDOS/UPDATED/20TH STREET CONDOS WEST - 3B1.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	20TH STREET CONDOS WEST
Subarea ID	3A
Area (ac)	1.5
Flow Path Length (ft)	539.0
Flow Path Slope (vft/hft)	0.012
50-yr Rainfall Depth (in)	4.0
Percent Impervious	0.4
Soil Type	134
Design Storm Frequency	25-yr
Fire Factor	0
LID	False

Output Results

Modeled (25-yr) Rainfall Depth (in)	3.512
Peak Intensity (in/hr)	1.1789
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.42
Time of Concentration (min)	17.0
Clear Peak Flow Rate (cfs)	0.7427
Burned Peak Flow Rate (cfs)	0.7427
24-Hr Clear Runoff Volume (ac-ft)	0.1829
24-Hr Clear Runoff Volume (cu-ft)	7965.2451



Peak Flow Hydrologic Analysis

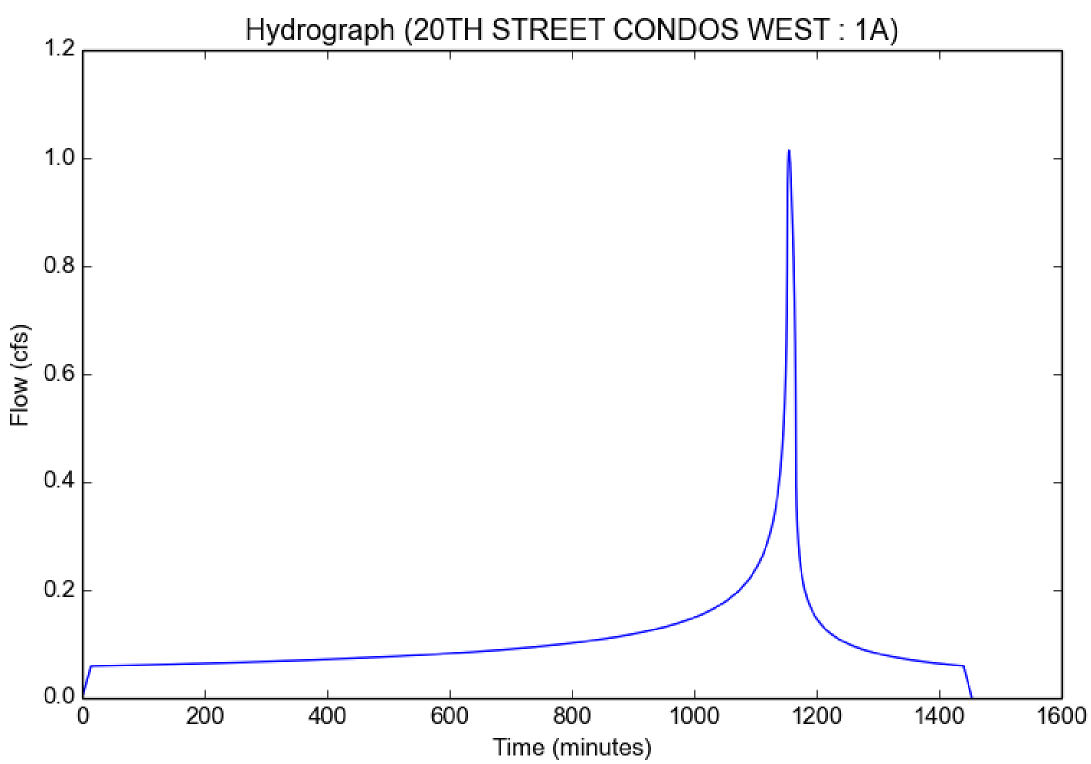
File location: C:/Users/Ryan Duke/Desktop/20TH STREET CONDOS/UPDATED/20TH STREET CONDOS WEST - 1A.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	20TH STREET CONDOS WEST
Subarea ID	4B
Area (ac)	1.8
Flow Path Length (ft)	411.0
Flow Path Slope (vft/hft)	0.012
50-yr Rainfall Depth (in)	4.0
Percent Impervious	0.4
Soil Type	134
Design Storm Frequency	25-yr
Fire Factor	0
LID	False

Output Results

Modeled (25-yr) Rainfall Depth (in)	3.512
Peak Intensity (in/hr)	1.2915
Undeveloped Runoff Coefficient (Cu)	0.1274
Developed Runoff Coefficient (Cd)	0.4365
Time of Concentration (min)	14.0
Clear Peak Flow Rate (cfs)	1.0146
Burned Peak Flow Rate (cfs)	1.0146
24-Hr Clear Runoff Volume (ac-ft)	0.2197
24-Hr Clear Runoff Volume (cu-ft)	9570.3703



Peak Flow Hydrologic Analysis

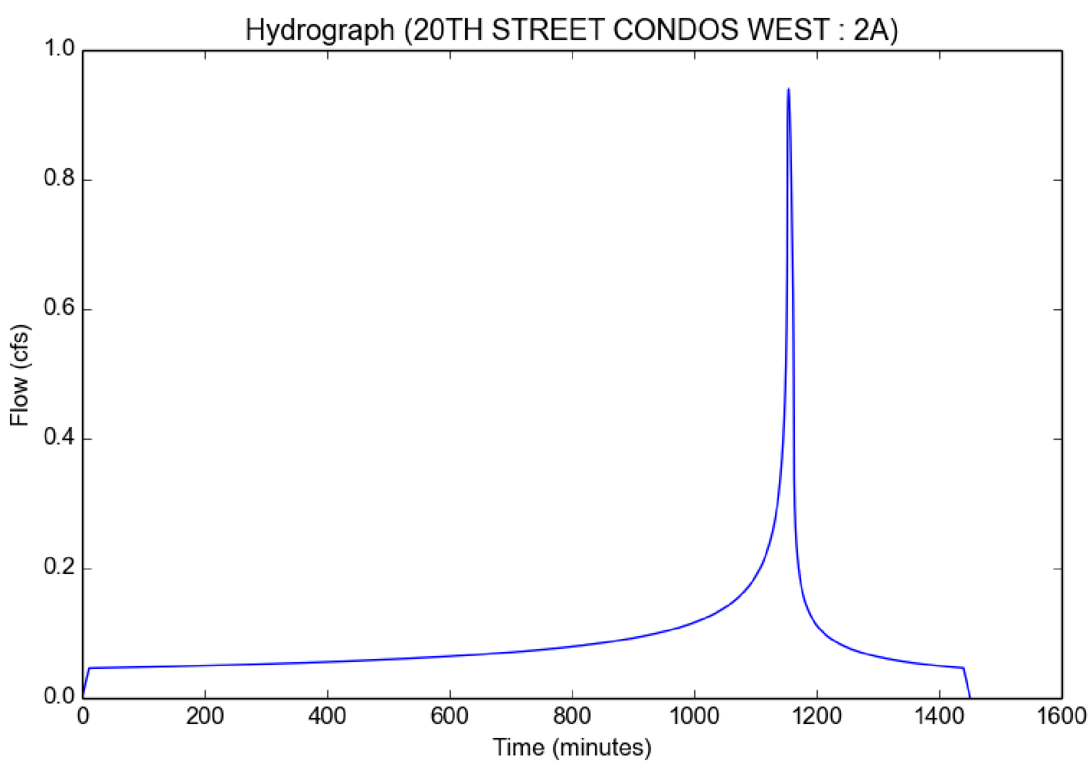
File location: C:/Users/Ryan Duke/Desktop/20TH STREET CONDOS/UPDATED/20TH STREET CONDOS WEST - 2A.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	20TH STREET CONDOS WEST
Subarea ID	5B
Area (ac)	1.4
Flow Path Length (ft)	293.0
Flow Path Slope (vft/hft)	0.012
50-yr Rainfall Depth (in)	4.0
Percent Impervious	0.4
Soil Type	134
Design Storm Frequency	25-yr
Fire Factor	0
LID	False

Output Results

Modeled (25-yr) Rainfall Depth (in)	3.512
Peak Intensity (in/hr)	1.4465
Undeveloped Runoff Coefficient (Cu)	0.1739
Developed Runoff Coefficient (Cd)	0.4643
Time of Concentration (min)	11.0
Clear Peak Flow Rate (cfs)	0.9403
Burned Peak Flow Rate (cfs)	0.9403
24-Hr Clear Runoff Volume (ac-ft)	0.1714
24-Hr Clear Runoff Volume (cu-ft)	7465.8553



Peak Flow Hydrologic Analysis

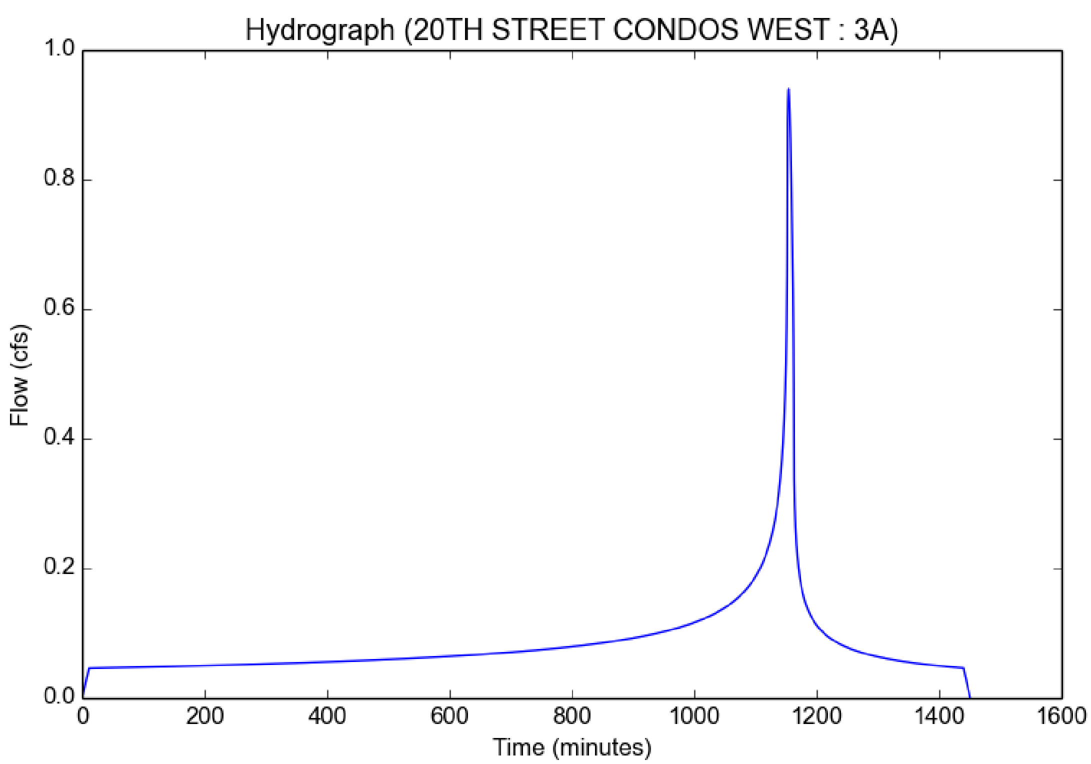
File location: C:/Users/Ryan Duke/Desktop/20TH STREET CONDOS/UPDATED/20TH STREET CONDOS WEST - 3A.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	20TH STREET CONDOS WEST
Subarea ID	6B
Area (ac)	1.4
Flow Path Length (ft)	297.0
Flow Path Slope (vft/hft)	0.012
50-yr Rainfall Depth (in)	4.0
Percent Impervious	0.4
Soil Type	134
Design Storm Frequency	25-yr
Fire Factor	0
LID	False

Output Results

Modeled (25-yr) Rainfall Depth (in)	3.512
Peak Intensity (in/hr)	1.4465
Undeveloped Runoff Coefficient (Cu)	0.1739
Developed Runoff Coefficient (Cd)	0.4643
Time of Concentration (min)	11.0
Clear Peak Flow Rate (cfs)	0.9403
Burned Peak Flow Rate (cfs)	0.9403
24-Hr Clear Runoff Volume (ac-ft)	0.1714
24-Hr Clear Runoff Volume (cu-ft)	7465.8553



Peak Flow Hydrologic Analysis

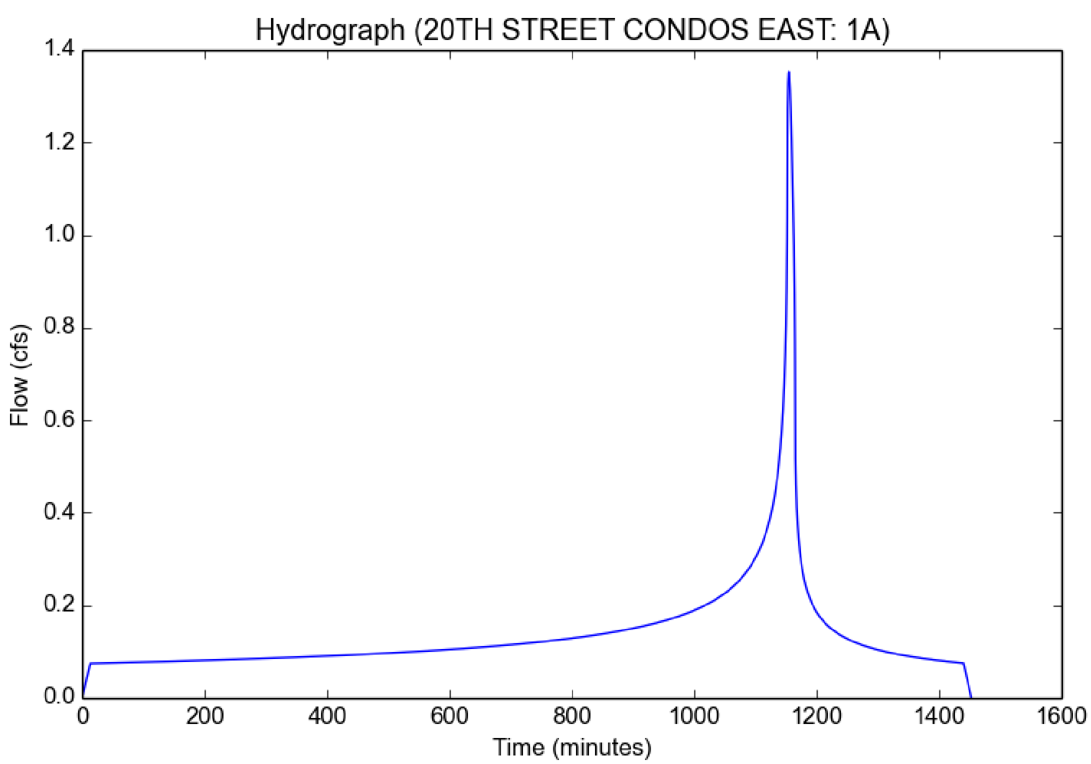
File location: C:/Users/Ryan Duke/Desktop/20TH STREET CONDOS/UPDATED/20TH STREET CONDOS EAST - 1A.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	20TH STREET CONDOS EAST
Subarea ID	8C
Area (ac)	2.2
Flow Path Length (ft)	400.0
Flow Path Slope (vft/hft)	0.012
50-yr Rainfall Depth (in)	4.0
Percent Impervious	0.42
Soil Type	134
Design Storm Frequency	25-yr
Fire Factor	0
LID	False

Output Results

Modeled (25-yr) Rainfall Depth (in)	3.512
Peak Intensity (in/hr)	1.3373
Undeveloped Runoff Coefficient (Cu)	0.1411
Developed Runoff Coefficient (Cd)	0.4599
Time of Concentration (min)	13.0
Clear Peak Flow Rate (cfs)	1.3529
Burned Peak Flow Rate (cfs)	1.3529
24-Hr Clear Runoff Volume (ac-ft)	0.279
24-Hr Clear Runoff Volume (cu-ft)	12151.3604



Peak Flow Hydrologic Analysis

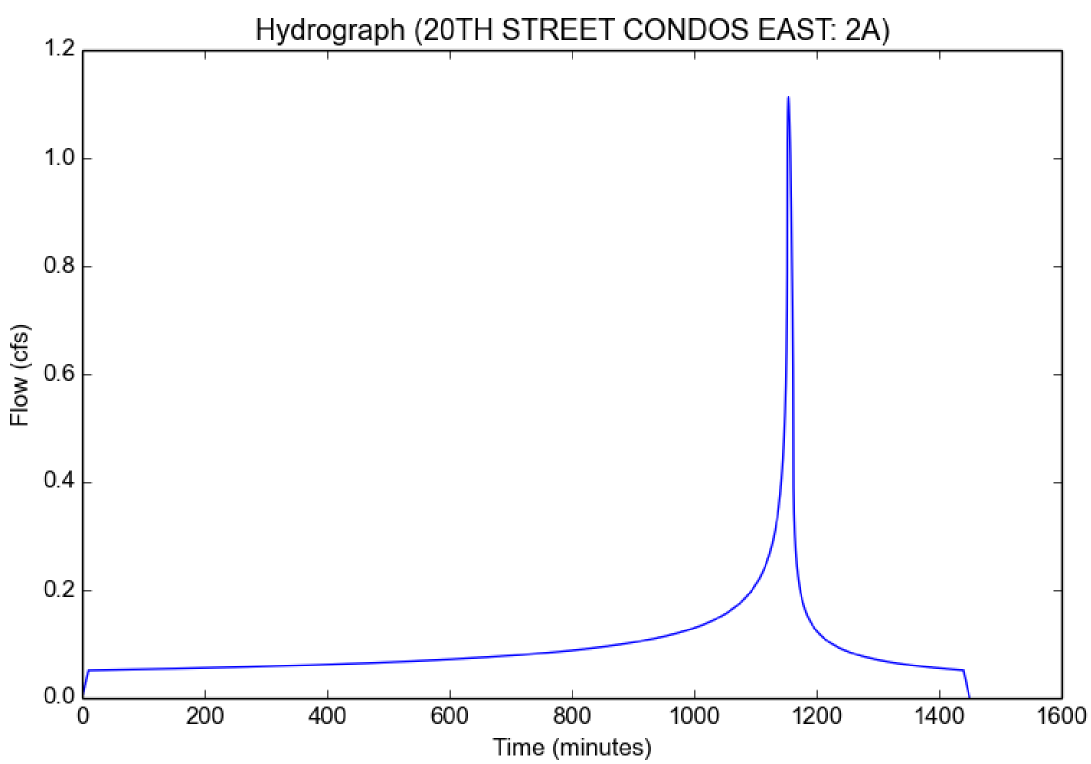
File location: C:/Users/Ryan Duke/Desktop/20TH STREET CONDOS/UPDATED/20TH STREET CONDOS EAST - 2A.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	20TH STREET CONDOS EAST
Subarea ID	9C
Area (ac)	1.5
Flow Path Length (ft)	272.0
Flow Path Slope (vft/hft)	0.012
50-yr Rainfall Depth (in)	4.0
Percent Impervious	0.42
Soil Type	134
Design Storm Frequency	25-yr
Fire Factor	0
LID	False

Output Results

Modeled (25-yr) Rainfall Depth (in)	3.512
Peak Intensity (in/hr)	1.5128
Undeveloped Runoff Coefficient (Cu)	0.1937
Developed Runoff Coefficient (Cd)	0.4904
Time of Concentration (min)	10.0
Clear Peak Flow Rate (cfs)	1.1127
Burned Peak Flow Rate (cfs)	1.1127
24-Hr Clear Runoff Volume (ac-ft)	0.1908
24-Hr Clear Runoff Volume (cu-ft)	8311.0774



Peak Flow Hydrologic Analysis

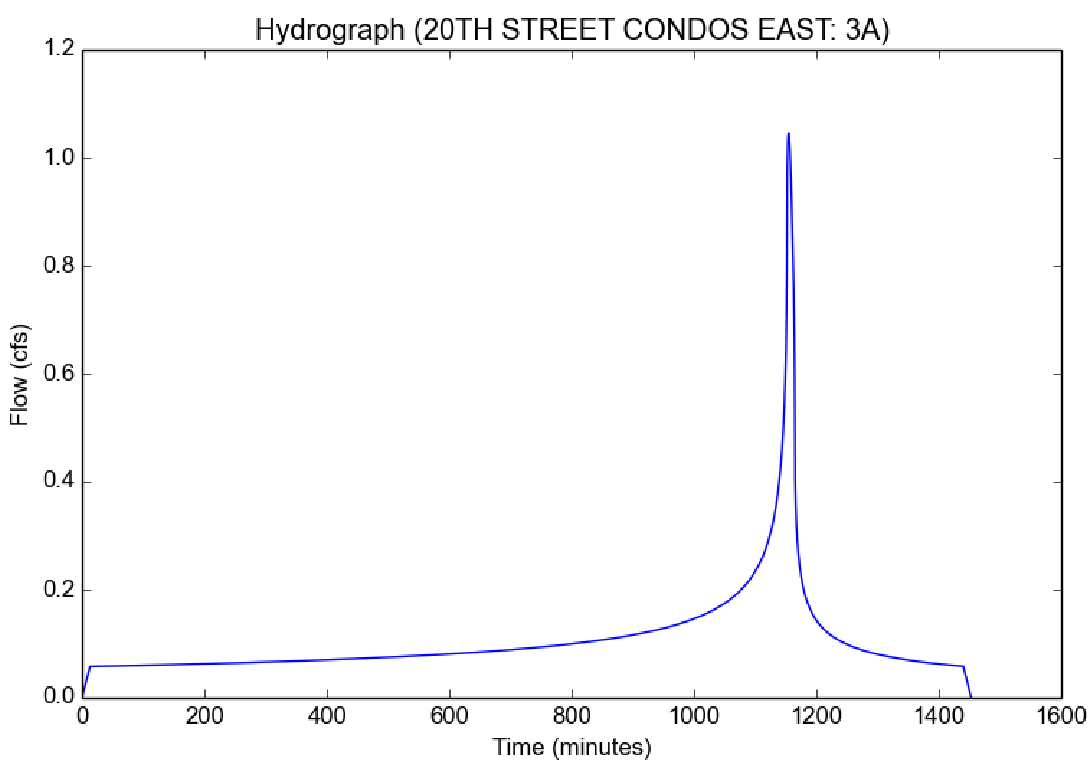
File location: C:/Users/Ryan Duke/Desktop/20TH STREET CONDOS/UPDATED/20TH STREET CONDOS EAST - 3A.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	20TH STREET CONDOS EAST
Subarea ID	10C
Area (ac)	1.7
Flow Path Length (ft)	399.0
Flow Path Slope (vft/hft)	0.012
50-yr Rainfall Depth (in)	4.0
Percent Impervious	0.42
Soil Type	134
Design Storm Frequency	25-yr
Fire Factor	0
LID	False

Output Results

Modeled (25-yr) Rainfall Depth (in)	3.512
Peak Intensity (in/hr)	1.3373
Undeveloped Runoff Coefficient (Cu)	0.1411
Developed Runoff Coefficient (Cd)	0.4599
Time of Concentration (min)	13.0
Clear Peak Flow Rate (cfs)	1.0454
Burned Peak Flow Rate (cfs)	1.0454
24-Hr Clear Runoff Volume (ac-ft)	0.2156
24-Hr Clear Runoff Volume (cu-ft)	9389.6876



Peak Flow Hydrologic Analysis

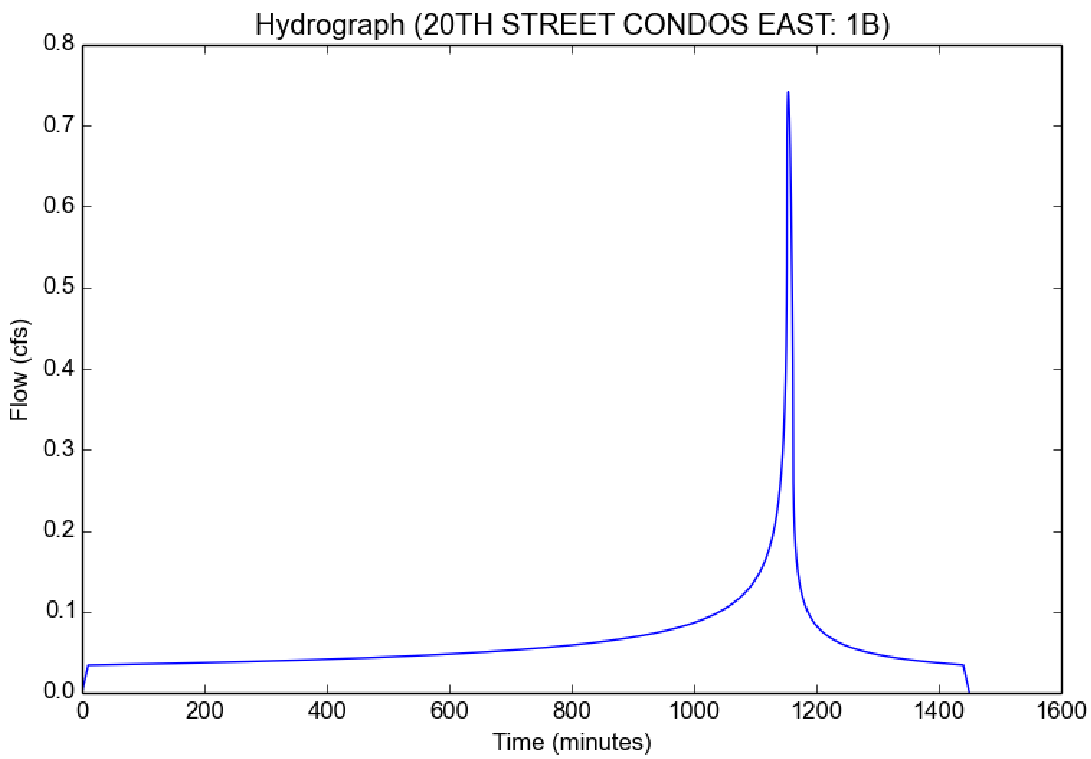
File location: C:/Users/Ryan Duke/Desktop/20TH STREET CONDOS/UPDATED/20TH STREET CONDOS EAST - 1B.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	20TH STREET CONDOS EAST
Subarea ID	11D
Area (ac)	1.0
Flow Path Length (ft)	280.0
Flow Path Slope (vft/hft)	0.012
50-yr Rainfall Depth (in)	4.0
Percent Impervious	0.42
Soil Type	134
Design Storm Frequency	25-yr
Fire Factor	0
LID	False

Output Results

Modeled (25-yr) Rainfall Depth (in)	3.512
Peak Intensity (in/hr)	1.5128
Undeveloped Runoff Coefficient (Cu)	0.1937
Developed Runoff Coefficient (Cd)	0.4904
Time of Concentration (min)	10.0
Clear Peak Flow Rate (cfs)	0.7418
Burned Peak Flow Rate (cfs)	0.7418
24-Hr Clear Runoff Volume (ac-ft)	0.1272
24-Hr Clear Runoff Volume (cu-ft)	5540.7183



Peak Flow Hydrologic Analysis

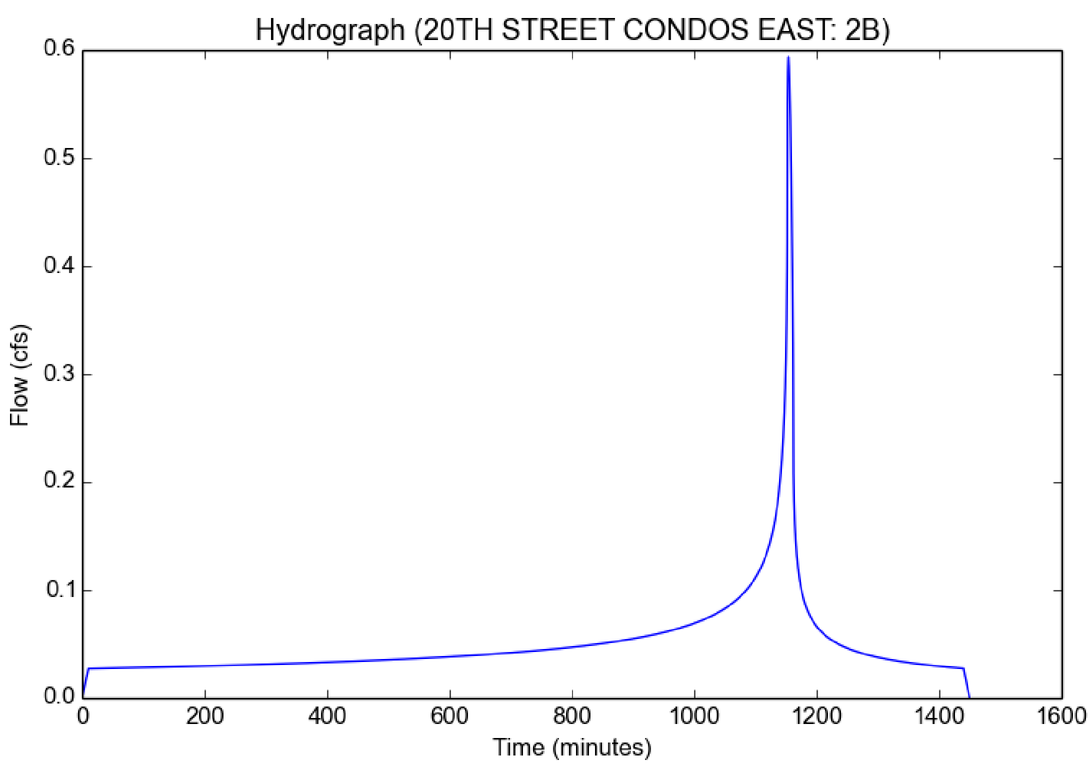
File location: C:/Users/Ryan Duke/Desktop/20TH STREET CONDOS/UPDATED/20TH STREET CONDOS EAST - 2B.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	20TH STREET CONDOS EAST
Subarea ID	12D
Area (ac)	0.8
Flow Path Length (ft)	281.0
Flow Path Slope (vft/hft)	0.012
50-yr Rainfall Depth (in)	4.0
Percent Impervious	0.42
Soil Type	134
Design Storm Frequency	25-yr
Fire Factor	0
LID	False

Output Results

Modeled (25-yr) Rainfall Depth (in)	3.512
Peak Intensity (in/hr)	1.5128
Undeveloped Runoff Coefficient (Cu)	0.1937
Developed Runoff Coefficient (Cd)	0.4904
Time of Concentration (min)	10.0
Clear Peak Flow Rate (cfs)	0.5935
Burned Peak Flow Rate (cfs)	0.5935
24-Hr Clear Runoff Volume (ac-ft)	0.1018
24-Hr Clear Runoff Volume (cu-ft)	4432.5746



Peak Flow Hydrologic Analysis

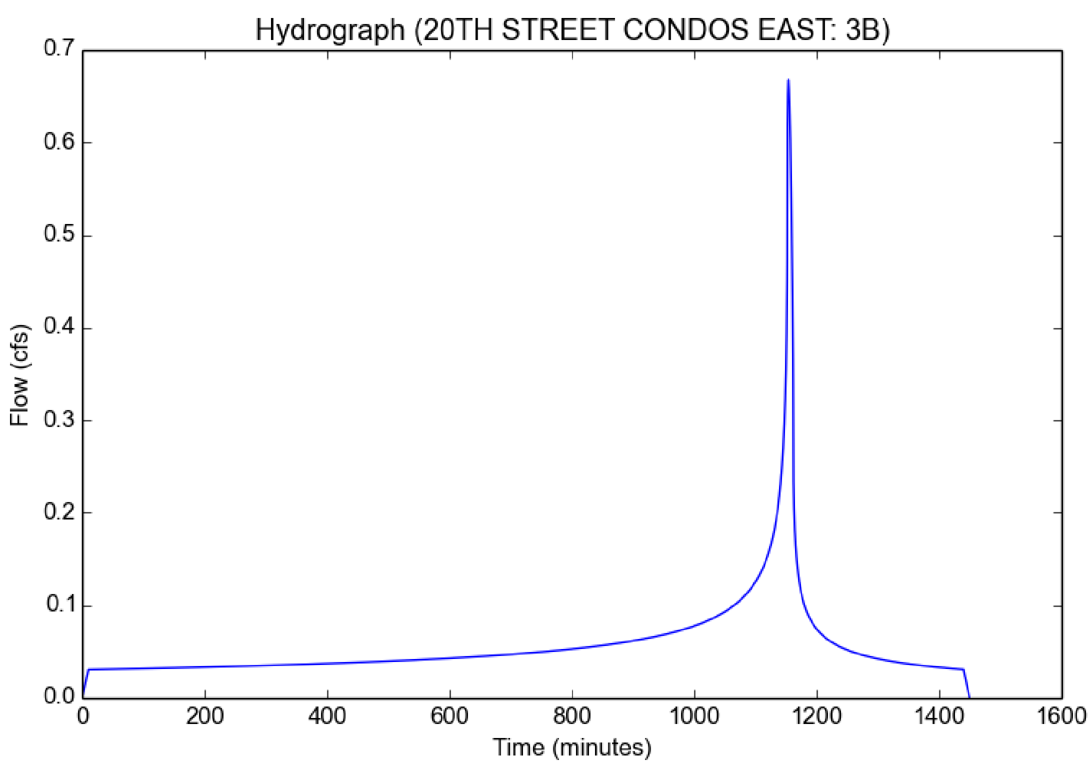
File location: C:/Users/Ryan Duke/Desktop/20TH STREET CONDOS/UPDATED/20TH STREET CONDOS EAST - 3B.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	20TH STREET CONDOS EAST
Subarea ID	13D
Area (ac)	0.9
Flow Path Length (ft)	289.0
Flow Path Slope (vft/hft)	0.012
50-yr Rainfall Depth (in)	4.0
Percent Impervious	0.42
Soil Type	134
Design Storm Frequency	25-yr
Fire Factor	0
LID	False

Output Results

Modeled (25-yr) Rainfall Depth (in)	3.512
Peak Intensity (in/hr)	1.5128
Undeveloped Runoff Coefficient (Cu)	0.1937
Developed Runoff Coefficient (Cd)	0.4904
Time of Concentration (min)	10.0
Clear Peak Flow Rate (cfs)	0.6676
Burned Peak Flow Rate (cfs)	0.6676
24-Hr Clear Runoff Volume (ac-ft)	0.1145
24-Hr Clear Runoff Volume (cu-ft)	4986.6464



Peak Flow Hydrologic Analysis

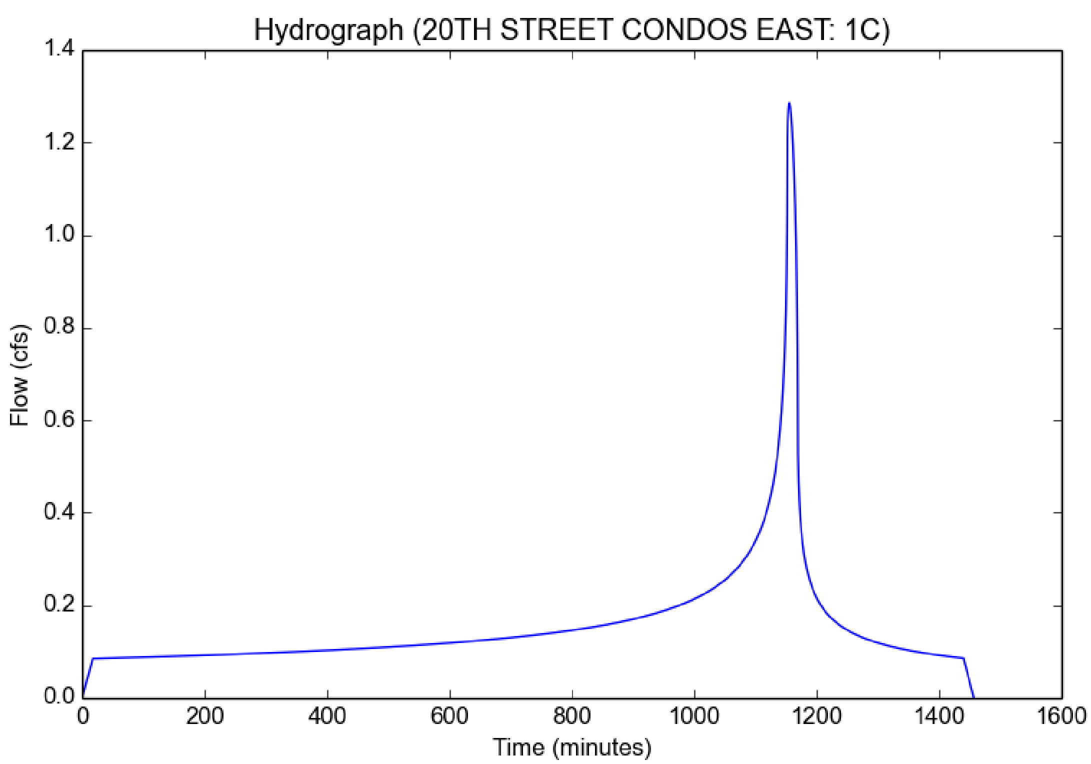
File location: C:/Users/Ryan Duke/Desktop/20TH STREET CONDOS/UPDATED/20TH STREET CONDOS EAST - 1C.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	20TH STREET CONDOS EAST
Subarea ID	16E
Area (ac)	2.5
Flow Path Length (ft)	568.0
Flow Path Slope (vft/hft)	0.012
50-yr Rainfall Depth (in)	4.0
Percent Impervious	0.42
Soil Type	124
Design Storm Frequency	25-yr
Fire Factor	0
LID	False

Output Results

Modeled (25-yr) Rainfall Depth (in)	3.512
Peak Intensity (in/hr)	1.1789
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.436
Time of Concentration (min)	17.0
Clear Peak Flow Rate (cfs)	1.285
Burned Peak Flow Rate (cfs)	1.285
24-Hr Clear Runoff Volume (ac-ft)	0.3164
24-Hr Clear Runoff Volume (cu-ft)	13781.1384



Peak Flow Hydrologic Analysis

File location: C:/Users/Ryan Duke/Desktop/20TH STREET CONDOS/UPDATED/20TH STREET CONDOS EAST - 1D.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	20TH STREET CONDOS EAST
Subarea ID	17F
Area (ac)	2.6
Flow Path Length (ft)	521.0
Flow Path Slope (vft/hft)	0.012
50-yr Rainfall Depth (in)	4.0
Percent Impervious	0.42
Soil Type	124
Design Storm Frequency	25-yr
Fire Factor	0
LID	False

Output Results

Modeled (25-yr) Rainfall Depth (in)	3.512
Peak Intensity (in/hr)	1.2129
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.436
Time of Concentration (min)	16.0
Clear Peak Flow Rate (cfs)	1.375
Burned Peak Flow Rate (cfs)	1.375
24-Hr Clear Runoff Volume (ac-ft)	0.329
24-Hr Clear Runoff Volume (cu-ft)	14332.3779

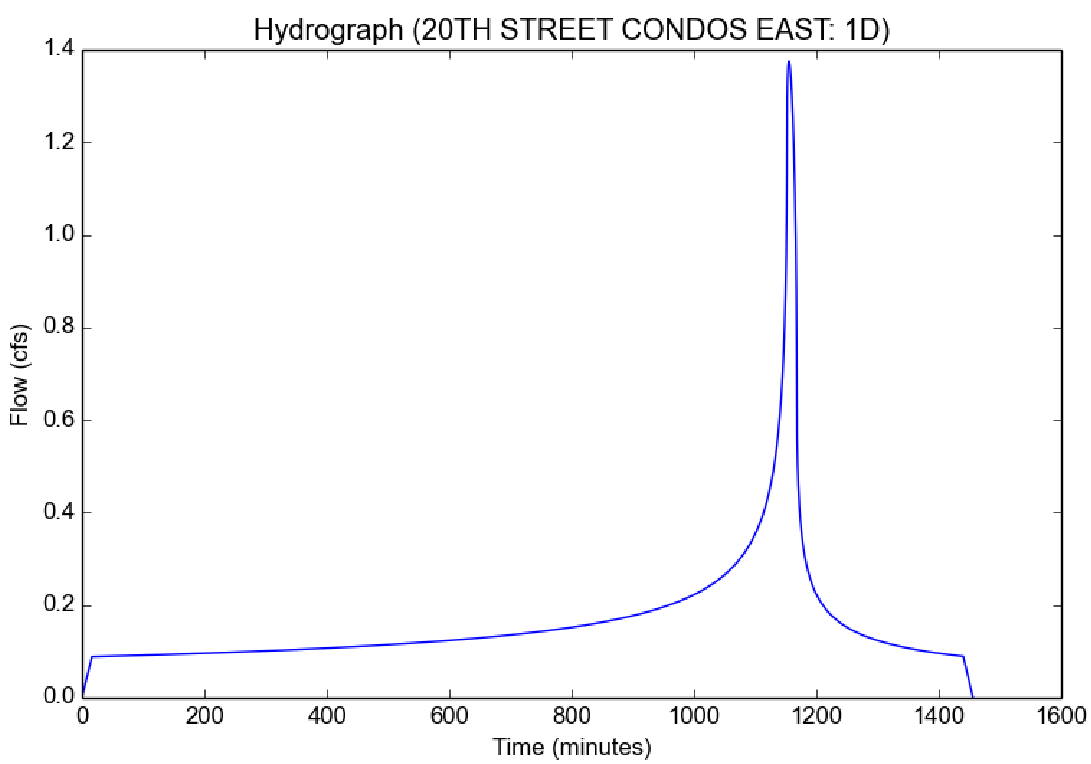
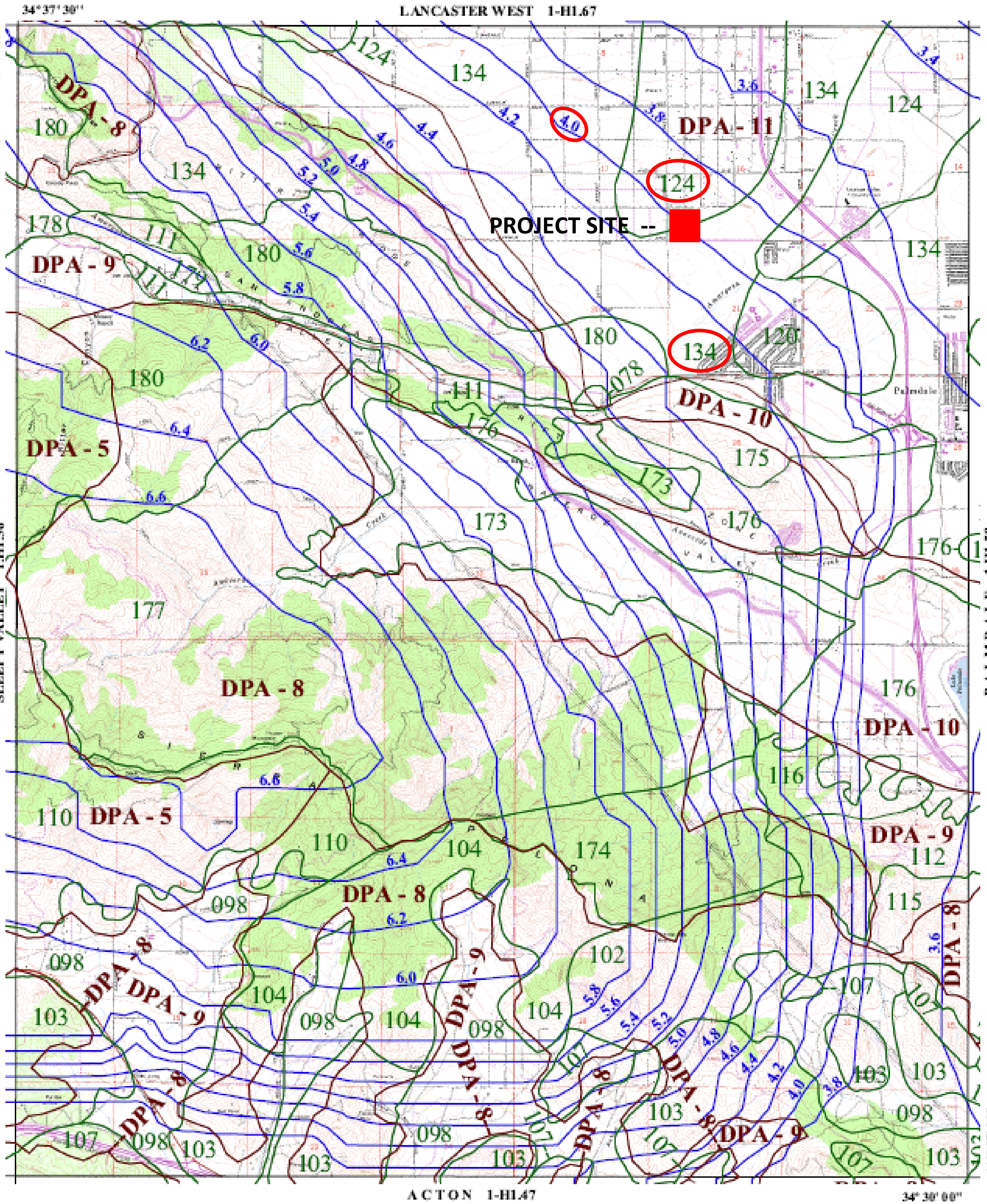


FIGURE 4:
ISOHYET MAP



016 SOIL CLASSIFICATION AREA

7.2 INCHES OF RAINFALL

DPA - 6 DEBRIS POTENTIAL AREA

25-YEAR 24-HOUR ISOHYET REDUCTION FACTOR: 0.878

10-YEAR 24-HOUR ISOHYET REDUCTION FACTOR: 0.714

RITTER RIDGE

50-YEAR 24-HOUR ISOHYET

1-H1.57

Conclusion

In conclusion, the area has been assessed and quantified to sufficiently size the proposed storm drain improvements and storm water basins. This analysis quantified the areas which flow towards each of the proposed improvements within the site. The analysis has also determined the volume required to mitigate the delta Q for the project and storm drain conduit sizes required to convey this storm water. Each sub-area analysis was also used to size catch basin inlet's within individual tributary areas.

It is of our opinion that this analysis sufficiently quantifies the project area, storm water runoff flow rates, and calculated storm drain device sizes to safely collect and convey the storm water run-off.

Please contact our office for any additional questions.

Sincerely,

Ryan Duke P.E.
RCE 79729

Principle Engineer

APPENDIX: E

Cage Properties LLC

20th Street West and Rancho Vista Development
Palmdale, CA 93551

SEWER AREA STUDY

Prepared for:

Cage Properties LLC.

Duke Engineering
44732 Yucca Avenue
Lancaster, California 93534
Phone 661-992-8199

Date: November 20, 2019

<u>ENGINEER'S CERTIFICATION:</u>

THE REGEISTERED PROEFESSIONAL ENGINEER CERTIFIES THAT THE SEWER FACILITIES HAVE BEEN DESIGNED IN ACCORDANCE WITH THE CITY OF PALMDALE ENGINEERING DESIGN GUIDELINES POLICES & PROCEDURES.

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Introduction

The purpose of this study is to determine the increase in effluent produced by the proposed project and project its impact on the existing sanitary sewer infrastructure.

Approach:

The approach that will be used in determining this increase in effluent will be by both 'Estimated Average Daily Sewage Flows by Occupancies' and 'Zoning Coefficients'. The greater of the two values will be used in determining the projects increase in effluent.

Purpose:

The purpose of this analysis will be to determine if the increase in effluent will exceed the allowable maximum flow depth of the existing sanitary sewer system. The study will also size the proposed sewer main lines to adequately serve the project site and any tributary areas.

Project Location:

The project site is located at the northeast corner of 20th Street West and Rancho Vista Blvd.(Avenue P). The property is approximately 31.35 acres and is currently undeveloped native desert with street improvements along both the westerly and southerly boundary lines, and a residential community along the northerly and easterly boundary lines.

Project Use:

The proposed Project will be a Multi-Family Development that will construct new buildings and adjacent parking to service the site. The project will construct an on-site sanitary sewer system that will collect effluent from each structure and convey the effluent to an on-site 8" main that will flow South, towards the Existing Main Line along Avenue P. The site will connect to this 12" VCP main trunk line located along Division Street.

Analysis

Onsite Sewer Area Study

The proposed project of Residential Buildings will develop the following effluent:

Analysis A: *'Estimated Average Daily Sewage Flows for Various Occupancies'*

Unit Types:

Occupancy	Units	DU	Avg Dly Flow	ADF_{Total}	
Triplex	60	75	200	15,000	
1 Bedroom	138	138	200	27,600	
2 Bedroom	144	288	250	72,000	
3 Bedroom	38	114	300	34,200	
SFR	48	96	300	28,800	
			Sum ADF_{Total}	177,600	gallons/day

ADF_{TOTAL} = 0.69 CFS

Gal/Day = 0.134Cubic Feet / Day = 0.134CF/24Hours = 0.134CF/1440Min = 0.134CF/86,400Sec

1 Gallon/Day = 0.00000155 CFS

ADF_{Total} = 207,000 Gal/Day x 0.00000155 = **0.32 CFS x 2.5 Peaking = 0.69 CFS** **[GOVERNS]**

Analysis B: *'Zoning Coefficients'*

Proposed Zoning: **R-2**

Flow Rate: **0.008 CFS/Acre**

Total Acres: **(9.43 Acres + 5.13 Acres) = 14.56 Acres (Net Usable)**

Total Flow Rate: **0.116 CFS**

Proposed Zoning: **R-3**

Flow Rate: **0.012 CFS/Acre**

Total Acres: **18.23 Acres (Net Usable)**

Total Flow Rate: **0.219 CFS**

Total Flow Rate: 0.335 CFS

On-Site Results:

The coefficients from the above analysis generate a maximum total estimated flow rate is 0.69 cfs. The Capacity of the proposed 10" on-site Sewer main is 0.73 cfs with a flow depth of 50% which is greater than the actual accumulated effluent and is therefore acceptable.

Offsite Sewer Area Study

The proposed project's sewer line will ultimately connect to the existing 12" VCP Sewer pipe located in Rancho Vista Blvd (Avenue P). The point of connection for the project site will be at the existing extra deep manhole located at the intersection of Dover Drive and Rancho Vista Blvd.

The area tributary to this existing 12" VCP sewer line is approximately 642 acres which is primarily residential development (R-1). Using the maximum flow rate of 50% for a sewer pipe less than 12" in diameter, the allowable flow rate is 1.261 cfs at a slope of 0.40%.

To get the most accurate measurement of the impact to the sewer system for the proposed development, a flow study from February 8th, 2016 will be used in reference to the existing capacity of the existing sewer system.

This flow study determined that at peak flows, the existing 12" sewer main is at 34% capacity (4 inch depth of flow) at the location in which the proposed development will be connecting. Given the capacity of the 12" sewer line at 50% capacity (1.261 cfs see off-site calculation A) and the current measured flow depth per report dated 02/08/19 at 34% (0.567 cfs see offsite calculation B), determines that the sewer line has additional capacity of 0.694 cfs which is greater than the 0.69 cfs developed from the project site at Peak Flow. (See Manning's Calculations)

1.261 cfs (12" at 50%) – 0.567 (12" at 34%) = 0.694 cfs.

Trunk Line Capacity:

The information provided by LA County Sanitation District on their trunk line capacity is as follows:

The maximum capacity for the trunk line as given by LACSD is 8.7 million gallons per day(mgd). The existing conveyed peak flow of 1.1mgd was measured by the district in 2017. Therefore, the existing mainline is sufficiently sized at this time for the additional load by the proposed project.

Conclusion:

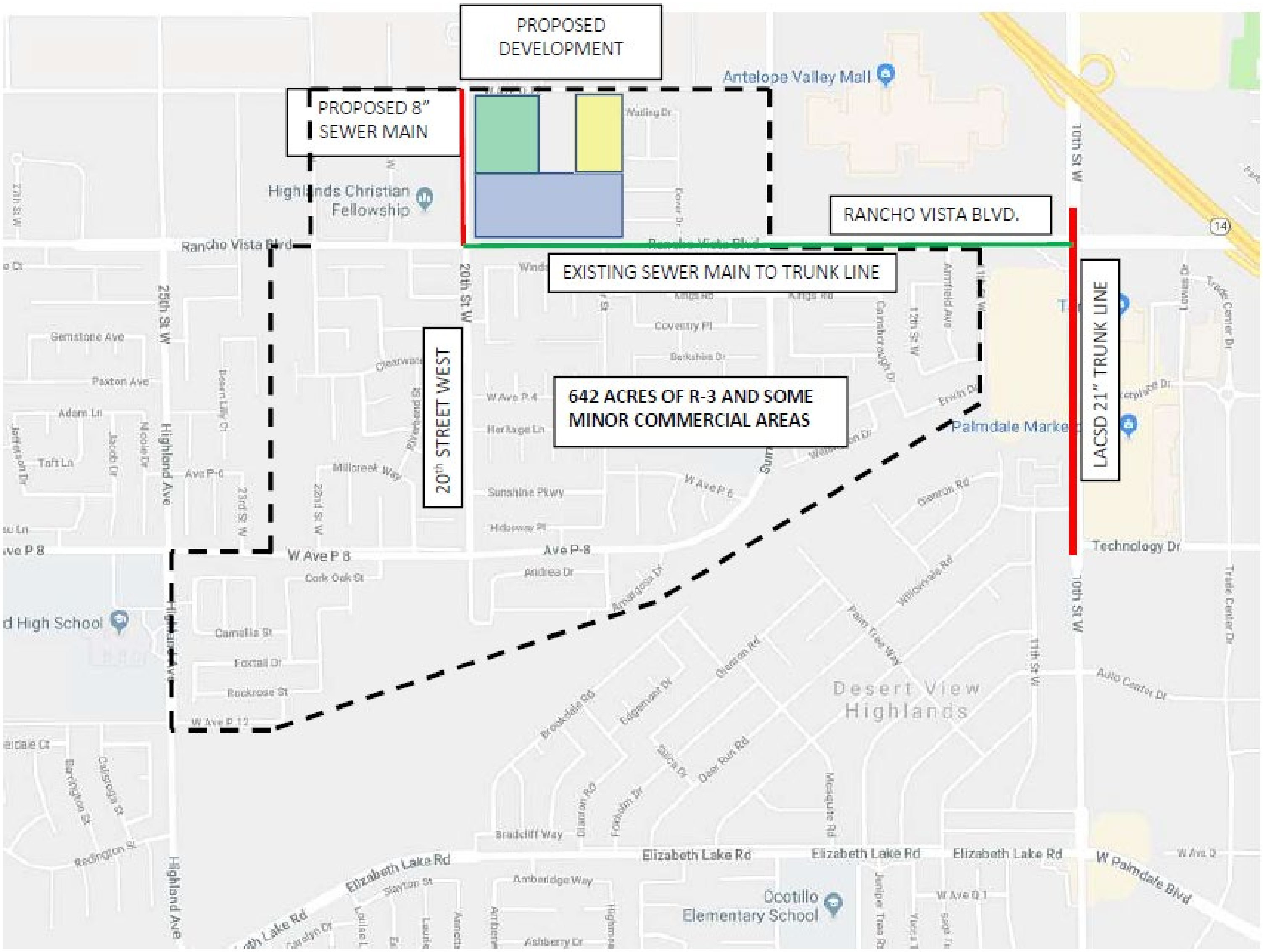
Based on the analysis conducted within this study, utilizing both the City of Palmdale flow rate standards as well as the flow study conducted for this sewer system, the analysis determined that the existing sewer system is sufficient to handle the proposed development. However, it is noted that the system is nearing max capacity with this development, and that additional sewer systems will need to be installed to relieve the system for any additional developments in the future.

Sincerely,

Ryan Duke P.E. RCE 79729

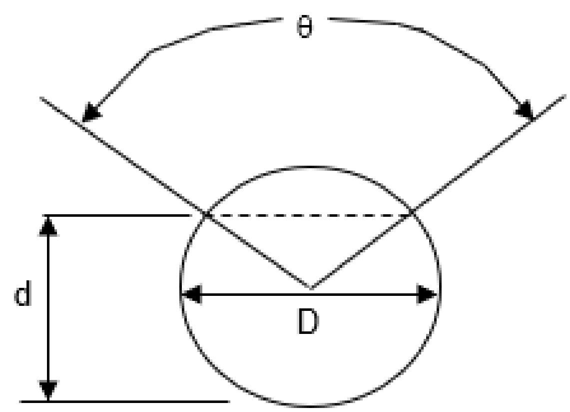
Principle Engineer

Area Maps


PROPOSED DEVELOPMENT
PROPOSED 8" SEWER MAIN
RANCHO VISTA BLVD.
EXISTING SEWER MAIN TO TRUNK LINE
20th STREET WEST
642 ACRES OF R-3 AND SOME MINOR COMMERCIAL AREAS
LACSD 21" TRUNK LINE
Antelope Valley Mall
Highlands Christian Fellowship
Palmdale Market
Desert View Highlands
Ocotillo Elementary School
Elizabeth Lake Rd
Highland Ave
W Ave P 8

Calculations

On-Site Analysis of Proposed Sewer Mainline

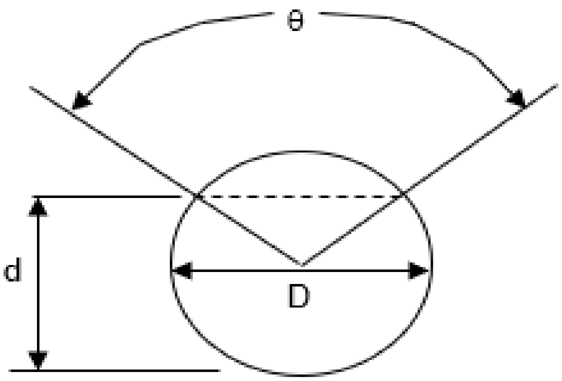


R = A/P		D =	10 in
A = Cross Section Area		d =	5 in
P = Wetted Perimeter		n =	0.013
S = Slope of Channel		Angle =	180 θ
n = Manning's Roughness Coefficient		S =	0.004 ft/ft

Area, ft^2	Wetted Perimeter	Hydraulic Radius	Velocity (ft/s)	Flow Rate (cfs)
0.273	1.309	0.208	2.665	0.727

Mannings Formula = $Q = (1.486/n)\ A\ R_h^{2/3}\ S^{1/2}$

(B) Off-Site Analysis of Public Sewer System Per Flow Study

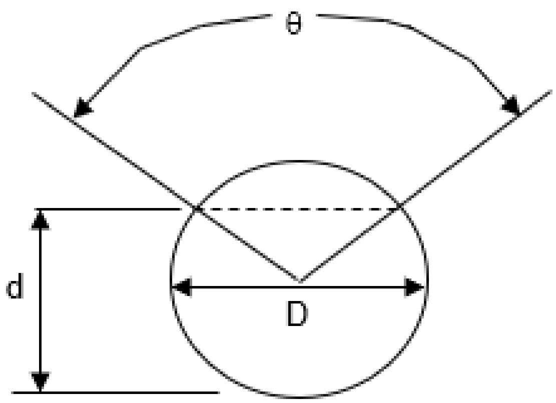


R = A/P	D =	12	in
A = Cross Section Area	d =	4.08	in
P = Wetted Perimeter	n =	0.013	
S = Slope of Channel	Angle =	142.67	θ
n = Manning's Roughness Coefficient	S =	0.004	ft/ft

Area, ft^2	Wetted Perimeter	Hydraulic Radius	Velocity (ft/s)	Flow Rate (cfs)
0.235	1.245	0.189	2.498	0.588

Mannings Formula = $Q = (1.486/n)\ A\ R_h^{\ 2/3}\ S^{\ 1/2}$

(A) **Off-Site Analysis of Public Sewer System Including Project Site**



R = A/P D = 12 in

A = Cross Section Area d = 6 in

P = Wetted Perimeter n = 0.013

S = Slope of Channel Angle = 176.18 θ

n = Manning's Roughness Coefficient S = 0.004 ft/ft

Area, ft^2	Wetted Perimeter	Hydraulic Radius	Velocity (ft/s)	Flow Rate (cfs)
0.409	1.604	0.255	3.081	1.261

Mannings Formula = $Q = (1.486/n)\, A\, R_h^{2/3}\, S^{1/2}$

APPENDIX: F

CHRISTOPHER JEAN & ASSOCIATES, INC.
ACOUSTICAL CONSULTING SERVICES

June 28, 2019

REVISED ACOUSTICAL ANALYSIS

20TH AND RANCHO

RESIDENTIAL DEVELOMENT

CITY OF PALMDALE

Prepared by:

Christopher Jean, INCE

Prepared for:

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CHRISTOPHER JEAN & ASSOCIATES, INC.
ACOUSTICAL CONSULTING SERVICES

SUMMARY

This revised analysis has been completed to determine the exterior and interior noise exposure and the necessary mitigation measures for the proposed 20th and Rancho Residential Development project located at 20th Street West and Rancho Vista Boulevard in the City of Palmdale. A list of requirements and recommendations is given in the following summary. Details are discussed in the body of the report.

A. EXTERIOR NOISE CONTROL

Exterior noise abatement is not required by the State of California or the Uniform Building Code. Exterior noise abatement is voluntary. The City of Palmdale may choose to enforce or otherwise agree to mitigation efforts by a developer to address its 65 dBA CNEL exterior noise limit for this or any project on a case-by-case basis. If such an agreement were to be reached, sound walls of a suggested total height could be erected. Such sound walls could be erected to a height of seven feet (7') around each first floor patio adjacent to Rancho Vista Boulevard. Similarly, sound walls at least six feet (6') high should be erected around each second floor balcony adjacent to Rancho Vista Boulevard. Sound walls at least five feet (5') high should also be erected around each first floor private patio adjacent to 20th Street West. Similarly, sound walls at least five feet (5') high should be erected around each second floor balcony adjacent to 20th Street West. Please refer to the Table 1 footnotes found in Section 2.0 of this report.

B. NOISE CONTROL BARRIER CONSTRUCTION MATERIALS

The required noise control barriers may be constructed using any of the following materials:

(1) Masonry block

(2) Stucco on wood frame

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(3) 3/4" plywood

(4) 1/4" tempered glass or 1/2" Lexan

(5) Earthen berm

(6) Any combination of the above materials or any material with a surface weight of at least 3.5 pounds per square foot.

Each completed noise control barrier must present a solid face from top-to-bottom and end-to-end. Cutouts are not permitted except for drain holes.

C. INTERIOR NOISE CONTROL

The buildings shall be constructed, as a minimum, in accordance with the outline of Table 4 found in the body of the report. This will be adequate for all units with the following exceptions:

(1) Add STC 34 glazing to all of single family rooms adjacent to 20th Street West and with any unprotected view of 20th Street West (units adjacent to project entries),

(2) Add STC 36 glazing to all multi-family rooms adjacent to 20th Street West and not protected by a sound barrier,

(3) Add STC 36 glazing, exterior wall upgrades and baffled attic vents to all multi-family rooms adjacent to Rancho Vista Boulevard and not protected by a sound barrier.

Please see Appendix 6 for an explanation of attic vent baffles.

D. VENTILATION

This analysis assumed that all windows and doors are kept closed. If the allowable interior noise levels are met by requiring that windows and doors be kept closed, then the design of the structure must also specify a ventilation or air conditioning system to provide a habitable interior environment. The ventilation system must not compromise the dwelling or guest room noise reduction.

E. UNIT-TO-UNIT NOISE CONTROL

Common floor/ceiling assemblies between units are subject to Title 24 Sound Transmission Class (STC) and Impact Insulation Class (IIC) requirements. The plan set provided for this analysis did not include common floor/ceiling assembly details. It is highly recommended that one of the following widely used common floor/ceiling assemblies, all of which rate at least STC 50, be incorporated into the building plans:

(1) 8" concrete slab (Riverbank Acoustical Labs, TL 76-77, 1977, 16f, for Pre-stressed Concrete Institute, STC 58 – IIC 71 with carpet, IIC 34 for bare floor)

(2) 1 1/2" lightweight concrete, plywood sub-floor, 3 1/2" thick fiberglass insulation, resilient channels, drywall ceiling (Geiger and Hamme CCA-14MT, CCA-15MT, 1972, 16f, for Cellular Concrete Association, STC 60 – IIC 73 with carpet, IIC 47 with vinyl tile)

(3) 1 3/8" Gyp-Crete, plywood sub-floor, 2" by 10" wood joists, 3 1/2" thick fiberglass insulation, resilient channels, 1/2" drywall ceiling (Riverbank Acoustical Labs TL 81-16, for Gyp-Crete Corporation, 1981, STC 60 – Riverbank Acoustical Labs IN 81-14, for Gyp-Crete Corporation, 1981, IIC 51 with sheet vinyl)

As can be seen by the above list, some of the recommended assemblies cannot meet the IIC 50 minimum requirement without carpet. Uncarpeted areas above other living units will require some form of proprietary isolation product included in the assembly to achieve the required rating. Such products include Enkasonic, Acousti-Mat, Regupol and others. Such products are designed to be installed atop the bare sub-floor and topped with either lightweight concrete/Gyp-Crete pour or additional layers of plywood. Each product has its own specific installation requirements. These products can produce both design and field IIC compliance with sheet vinyl or wood flooring. While various lab tests have shown these same products to produce design IIC compliance when used with ceramic tile, field testing experience has proven that actual ceramic tile installations are marginal. The use of ceramic tile or marble is not recommended, regardless of the installation method.

The plan set provided for this analysis did not include common wall assembly details. It is highly recommended that one of the following widely used common wall assemblies, all of which rate at least STC 50, be incorporated into the building plans:

(1) Two layers of 1/2" direct nailed drywall, 2" by 6" plate, 2" by 4" staggered studs, 3 1/2" thick fiberglass insulation, two layers 1/2" direct nailed drywall (Owens/Corning Fiberglas, OCF W-55-69, 1969, 16f, for Owens/Corning Fiberglas, STC 54)

(2) Two layers of 5/8" direct nailed drywall, 2" by 6" plate, 2" by 4" staggered studs, 3 1/2' thick fiberglass insulation, two layers 5/8" direct nailed drywall (National Gypsum Company NGC 2376, 1970, 16f, STC 53)

(3) 5/8" direct nailed drywall, 2" by 4" plate with 2" by 4" studs, 3 1/2" thick fiberglass insulation, 1" clear air space at plate, 2" by 4" plate with 2" by 4" studs, 5/8" direct nailed drywall (Owens/Corning Fiberglas OCF 448, 1967, 16f, STC 56)

(4) Same as #3 but with two layers of 3 1/2" thick fiberglass insulation (Riverbank Acoustical Labs TL 75-83, 1975, 16f, for U. S. Department of Agriculture, STC 57)

(5) Two layers 5/8" direct nailed drywall, 2" by 4" plate with 2" by 4" studs, 3 1/2" thick fiberglass insulation, 1" clear air space at plate, 2" by 4" plate with 2" by 4" studs, two layers 5/8" direct nailed drywall (National Gypsum Company, NGC 3056, 1970, 16f, for Gypsum Association, STC 58)

(6) Same as #5 but with two layers of 3 1/2" thick fiberglass insulation (Riverbank Acoustical Labs TL 75-82, 1975, 16f, for U. S. Department of Agriculture, STC 63)

All wall assemblies between any common space and a living unit must be an STC 50 minimum rated assembly. All plumbing, mechanical and electrical installations shall be installed per the instructions and details contained in Appendix 7. Add all appropriate details to the project plans.

F. PROJECT DISCLOSURE

The acoustical code requirements represent minimal acceptable standards. Compliance with the Building Department acoustical criteria does not require, guarantee or even imply that local sound sources will be mitigated to inaudibility. Compliance with an exterior noise limit of 65 dBA CNEL means that exterior noise will remain clearly audible within the mitigated exterior space. Compliance with an interior noise limit of 45 dBA CNEL means that exterior noise sources will remain audible on the interior of a building.

Due to quality control and other field related problems, the code minimum laboratory ratings of STC/IIC 50 for common assemblies does not guarantee that all common assemblies will pass a field test. In fact, there is a 50 percent chance that half of all common assemblies rated at the STC/IIC minimum could fail field tests. An STC 50 rated assembly will produce around 45 dBA of voice reduction in the field. This means that normal conversation in adjoining units will be audible a certain percentage of the time.

Do not misrepresent the degree of exterior to interior or unit-to-unit acoustical isolation as anything more than meeting code during any phase of this project. Never, ever, use any form of the term "Soundproof" to describe any portion of this project.

CHRISTOPHER JEAN & ASSOCIATES, INC.
ACOUSTICAL CONSULTING SERVICES

1.0 INTRODUCTION

This revised report presents the results of a noise impact and design study of the proposed 20th and Rancho Residential Development project located at 20th Street West and Rancho Vista Boulevard in the City of Palmdale. This report includes a discussion of the expected exterior community noise environment and the recommendations for control of noise in the exterior and interior living spaces as well as between living units.

A vicinity map showing the general location of the project site is presented in Exhibit 1 – Site Location Map. An aerial photograph of the existing project site and its surroundings is shown on Exhibit 2. The project site plan is shown on Exhibit 3. The project consists of single and multi-family housing.

2.0 APPLICABLE NOISE CRITERIA

The City of Palmdale requires all residential projects to conform to the requirements of Table 1.

TABLE 1

APPLICABLE NOISE CRITERIA (1)

Exterior	65 dBA CNEL
Interior	45 dBA CNEL
Unit-to-Unit	STC 50/IIC 50

(1) Please see Noise Rating Methods (Appendix 1) for an explanation of the commonly applicable acoustical terminology. Also note that the neither the State of California or the Uniform Building Code requires exterior noise mitigation. The City of Palmdale is free to enforce or waive its exterior noise limit as desired.

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3.0 DESIGN NOISE LEVELS

3.1 ROADWAYS

The expected future roadway noise impact was projected using the Federal Highway Administration's Highway Noise Prediction Model (FHWA RD-77-108) together with several roadway and site parameters that determine the projected impact of vehicular traffic noise. These include the roadway cross-section (e.g. number of lanes), the roadway active width, the average daily traffic (ADT), the vehicle travel speed, the percentage of auto and truck traffic, the roadway grade, the angle of view, the site conditions ("hard" or "soft" site), and the percentage of average daily traffic that flows each hour throughout a 24 hour period.

The future traffic volumes were taken from the City of Palmdale Circulation Element. The percentage of truck traffic was taken from a standard arterial mix. The same source was used to project the distribution by time of day. The input data is listed in Table 2.

TABLE 2

TRAFFIC INPUT DATA

	% DAY	% EVENING	% NIGHT	% VOLUME
Autos	75.51	12.57	9.34	100.0
Medium Trucks	1.56	0.09	0.19	100.0
Heavy Trucks	0.64	0.02	0.08	100.0

Volume = 32,000 ADT on Rancho Vista, 17,000 ADT on 20th Street West

Speed = 55 MPH on Rancho Vista, 55 MPH on 20th Street West

The calculations are contained in Appendix 2. The calculations yield design noise levels of 76 dBA CNEL at 50 feet from the centerline of Rancho Vista Boulevard and 73 dBA CNEL at 50 feet from the centerline of 20th Street West. The predicted noise contours with the project buildings in place are depicted in Exhibit 4.

3.2 RAILROAD

There are no railroad operations in the vicinity of the project site. Railroad noise will not impact the site.

3.3 AIRCRAFT

The Plant 42/Paldale Airport Noise Contours are shown on Exhibit 5. Exhibit 5 shows the site to lie just outside the 60 dBA CNEL noise contour. Aircraft noise, though frequently audible, will not impact the project site as defined by the City standards.

4.0 MITIGATION MEASURES

4.1 EXTERIOR

The mitigation of exterior noise to produce compliance with the City's 65 dBA CNEL exterior noise limit would require sound barriers along the major roadways. For purposes of analysis, the barrier height calculations assume that any barrier is located at the top of any slope between the roadway and building pads or patio/balcony elevations, and is only intended to reduce exterior noise to 65 dBA CNEL. The assumptions for the barrier height calculations are listed in Table 3 on the following page.

TABLE 3

BARRIER ANALYSIS GENERAL ASSUMPTIONS
FOR RECEIVER AND SOURCE GEOMETRY

RECEIVER ASSUMPTIONS	
HORIZONTAL GEOMETRY	VERTICAL GEOMETRY
Distance behind top-of-roadways barrier: 5' to 10'	Height above pad for ground level receivers: 3'
Distance behind individual patio and balcony barriers: 1' to 3'	Height above pad for second level receivers: 14'

SOURCE ASSUMPTIONS	
HORIZONTAL GEOMETRY *	VERTICAL GEOMETRY
For roadways with grades no greater than 2%, all vehicles were located at the single lane equivalent acoustic center of the full roadway. For roadways with over 2% grade, vehicle count was divided in half and located at the single lane equivalent acoustic center for each side of the roadway.	Automobiles: 0' above center of road grade Medium Trucks: 2.3' above center of road grade Heavy Trucks: 8' above center of road grade

* = Single Lane Equivalent (SLE) location.

As the City wishes to avoid sound walls in excess of six feet high, City staff has agreed to allow the sound barrier calculations to use a "seated" receiver height of three feet (3') above the ground. The barrier calculations contained in Appendix 3 show that individual private patios and balconies facing Rancho Vista Boulevard will require sound walls at least seven feet (7') high at first floor patios and at least six feet (6') high at second floor decks with any view of Rancho Vista Boulevard in order to comply with the City's 65 dBA CNEL exterior noise limit.

The barrier calculations also show that individual private patio and balcony barriers along 20th Street West would need to be at least five feet (5') high at first floor patios and at least five feet (5') high at second floor decks with any view of 20th Street West in order to comply with the City's 65 dBA CNEL exterior noise limit.

Even with a "seated" receiver height, the required first floor individual patio walls along Rancho Vista Boulevard will still exceed the City's preferred maximum wall height of six feet. One way around this problem to erect walls six feet high atop landscaped berms tall enough to create a total height equal to that required for compliance with the exterior noise limit. In this case, patio sound walls six feet (6') high atop earthen berms one foot (1') high would achieve the total barrier height of seven feet (7') required along Rancho Vista Boulevard in order to comply with the City's 65 dBA CNEL exterior noise limit.

The required noise control barriers may be constructed using any of the following materials:

(1) Masonry block

(2) Stucco on wood frame

(3) 3/4" plywood

(4) 1/4" tempered glass or 1/2" Lexan

(5) Earthen berm

(6) Any combination of the above materials or any material with a surface weight of at least 3.5 pounds per square foot.

Each completed noise control barrier must present a solid face from top-to-bottom. Cutouts and/or openings are not permitted except for drain holes.

4.2 INTERIOR

The City's exposure criteria for new residential construction require that the interior noise environment, attributable to outside noise sources, be limited to 45 dBA CNEL. Analysis and recommendations for control of outdoor-to-indoor noise intrusion are presented in this section.

The exterior-to-interior noise reduction expected for the planned construction was based on a detailed analysis of sample rooms and units planned for the development. Calculations of the expected typical noise reduction performance were performed for sample rooms. The analysis was based on the typical spectra expected for the primary sources of community noise impact, the typical octave-band transmission loss for each element in the planned building shell, the relative square footage of each element of the planned building shell, the expected typical interior surface treatment, and the acoustical absorption coefficient for each interior surface treatment. Corrections for the "A" Weighted room absorption factors are also included.

Each component of the building shell (e.g. exterior wall, windows, doors, etc.) provides a different amount of transmission loss for each "A" Weighted octave- band of community noise. With the knowledge of the building shell components and their individual octave band transmission loss values for the noise sources, calculations of the composite building shell transmission loss can be made for each room.

The characteristics of the basic building shell are listed in Table 4.

TABLE 4

BASIC BUILDING SHELL CHARACTERISTICS

PANEL	CONSTRUCTION
Exterior Wall	Siding or stucco, 2" X 4" studs, R-13 fiberglass insulation, 5/8" drywall
Windows	Double pane
Sliding Glass Door	Double pane
Roof	Shingle over 1/2" plywood, fiberglass insulation, 5/8" drywall, vented
Floor	Carpeted except kitchen and baths

Table 4 construction minimums will provide around 20 dBA of interior noise reduction. This will be adequate for all units exposed to exterior noise levels as high as 65 dBA CNEL. This will include all unit on the interior of the project as well as first floor levels of all units along the major roadways and protected by a perimeter sound wall. Units along 20th Street West will be exposed to exterior noise levels as high as 73 dBA CNEL and will require as much as 28 dBA of interior noise reduction. Units along Rancho Vista Boulevard will be exposed to exterior noise levels as high as 76 dBA CNEL and will require as much as 31 dBA of interior noise reduction.

Since Table 4 construction will yield only around 20 dBA, sample room calculations were carried out to determine how much additional mitigation is needed along the major roadways. These calculations are contained in Appendix 4 and the results are listed in Table 5 on the following page.

TABLE 5

ROOM NOISE REDUCTION VALUES

ROOM	NOISE REDUCTION VS. GLAZING STC							
	24	26	28	30	32	34	36	38
Multi-Family Bedroom	19	21	23	25	26	27	28	29
Multi-Family Living Rm	20	22	24	25	27	28	29	30
Single Family Bedroom	21	23	25	26	27	28	28	29

The results of Table 5 show that Table 4 construction alone cannot achieve the 31 dBA of interior noise reduction. Thus, additional calculations were performed assuming upgraded exterior walls and baffled attic vents. Exterior wall upgrades shall consist of two layers of interior drywall mounted on RC-1 resilient channels. These calculations are contained in Appendix 5 and the results are listed in Table 6.

TABLE 6

ROOM NOISE REDUCTION VALUES WITH EXTERIOR WALL UPGRADES AND BAFFLED ATTIC VENTS

ROOM	NOISE REDUCTION VS. GLAZING STC							
	24	26	28	30	32	34	36	38
Multi-Family Bedroom	20	22	24	26	28	29	31	33
Multi-Family Living Rm	20	22	24	26	28	30	32	34

The results of Tables 5 and 6 show that Table 4 construction should be adequate for all units with the following exceptions:

(1) Add STC 34 glazing to all of single family rooms adjacent to 20th Street West and with any unprotected view of 20th Street West (units adjacent to project entries),

(2) Add STC 36 glazing to all multi-family rooms adjacent to 20th Street West and not protected by a sound barrier,

(3) Add STC 36 glazing, exterior wall upgrades and baffled attic vents to all multi-family rooms adjacent to Rancho Vista Boulevard and not protected by a sound barrier.

Please see Appendix 6 for an explanation of attic vent baffles.

4.3 VENTILATION

If interior allowable noise levels are met by requiring that windows be unopenable or remain closed, then the design of the structure must also specify a ventilation or air conditioning system to provide a habitable interior environment. The ventilation system must not compromise the dwelling unit or guest room noise reduction.

4.4 UNIT-TO-UNIT NOISE CONTROL

Common floor/ceiling assemblies between units are subject to Title 24 Sound Transmission Class(STC) and Impact Insulation Class (IIC) requirements. The plan set provided for this analysis did not include common floor/ceiling assembly details. It is highly recommended that one of the following widely used common floor/ceiling assemblies, all of which rate at least STC 50, be incorporated into the building plans:

(1) 8" concrete slab (Riverbank Acoustical Labs, TL 76-77, 1977, 16f, Pre-stressed Concrete Institute, STC 58 -- IIC 71 with carpet, IIC 34 for bare floor)

(2) 1 1/2" lightweight concrete, sub-floor, R-11 insulation, resilient channel, drywall ceiling (Geiger and Hamme CCA-14MT, CCA-15MT, 1972, 16f, Cellular Concrete Associates, STC 60 --IIC 73 with carpet, IIC 47 with vinyl tile)

(3) 1 3/8" Gyp-Crete, sub-floor, 2" by 10" joists, R-11 insulation, resilient channel, 1/2" drywall ceiling (Riverbank Acoustical Labs TL 81-16, Gyp-Crete Corp., 1981, STC 60 -- Riverbank Acoustical Labs IN 81-14, Gyp-Crete Corp., 1981, IIC 51 with sheet vinyl)

As can be seen by the above list, some of the recommended assemblies cannot meet the IIC 50 minimum requirement without carpet. Uncarpeted areas above other living units will require some form of proprietary isolation product under the floor to achieve the required rating. Such products include Enkasonic, Acousti-Mat, USG SRM-25, and others. Such products are designed to be installed atop the bare sub-floor and topped with either a LWC/Gyp-Crete pour or additional layers of plywood. Each product has its own specific installation requirements. These products can produce both design and field IIC compliance with sheet vinyl or wood flooring. While various lab tests have shown these same products to produce design IIC compliance when used with ceramic tile, field testing experience has proven that actual ceramic tile installations are marginal. The use of ceramic tile or marble flooring is not recommended, regardless of the installation method.

The plan set provided for this analysis did not include common wall assembly details. It is highly recommended that one of the following widely used common wall assemblies, all of which rate at least STC 50, be incorporated into the building plans:

(1) Two layers 1/2" direct nailed drywall, 2" by 6" plate, 2" by 4" staggered studs, fiberglass insulation, two layers 1/2" direct nailed drywall (Owens/Corning Fiberglas, OCF W-55-69, 1969, 16f, Owens/Corning Fiberglas, STC 54)

(2) Two layers 5/8" direct nailed drywall, 2" by 6" plate, 2" by 4" staggered studs, R-11 insulation, two layers 5/8" direct nailed drywall (National Gypsum Co. NGC 2376, 1970, 16f, STC 53)

(3) 5/8" direct nailed drywall, 2" by 4" plate with 2" by 4" studs, R-11 insulation, 1" airspace at plate, 2" by 4" plate with 2" by 4" studs, 5/8" direct nailed drywall (Owens/Corning Fiberglas OCF 448, 1967, 16f, STC 56)

(4) Same as #3 with two layers of R-11 insulation (Riverbank Acoustical Labs TL75-83, 1975, 16f, U.S. Department of Agriculture, STC 57)

(5) Two layers 5/8" drywall direct nailed, 2" by 4" plate with 2" x 4" studs, 1" air space, 2" by 4" plate with 2" by 4" studs, R-11 insulation, two layers 5/8" drywall (National Gypsum Co. NGC 3056, 1970, 16f, Gypsum Association, STC 58)

(6) Same as #5 with two layers of R-11 insulation (Riverbank Acoustical Labs TL 75-82, 1975, 16f, U.S. Department of Agriculture, STC 63)

All wall assemblies between any common space and a living unit must be an STC 50 minimum rated assembly. All Plumbing and electrical installations shall be installed per the instructions contained in Appendix 7. Put all details onto Plans.

5.5 PROJECT DISCLOSURE

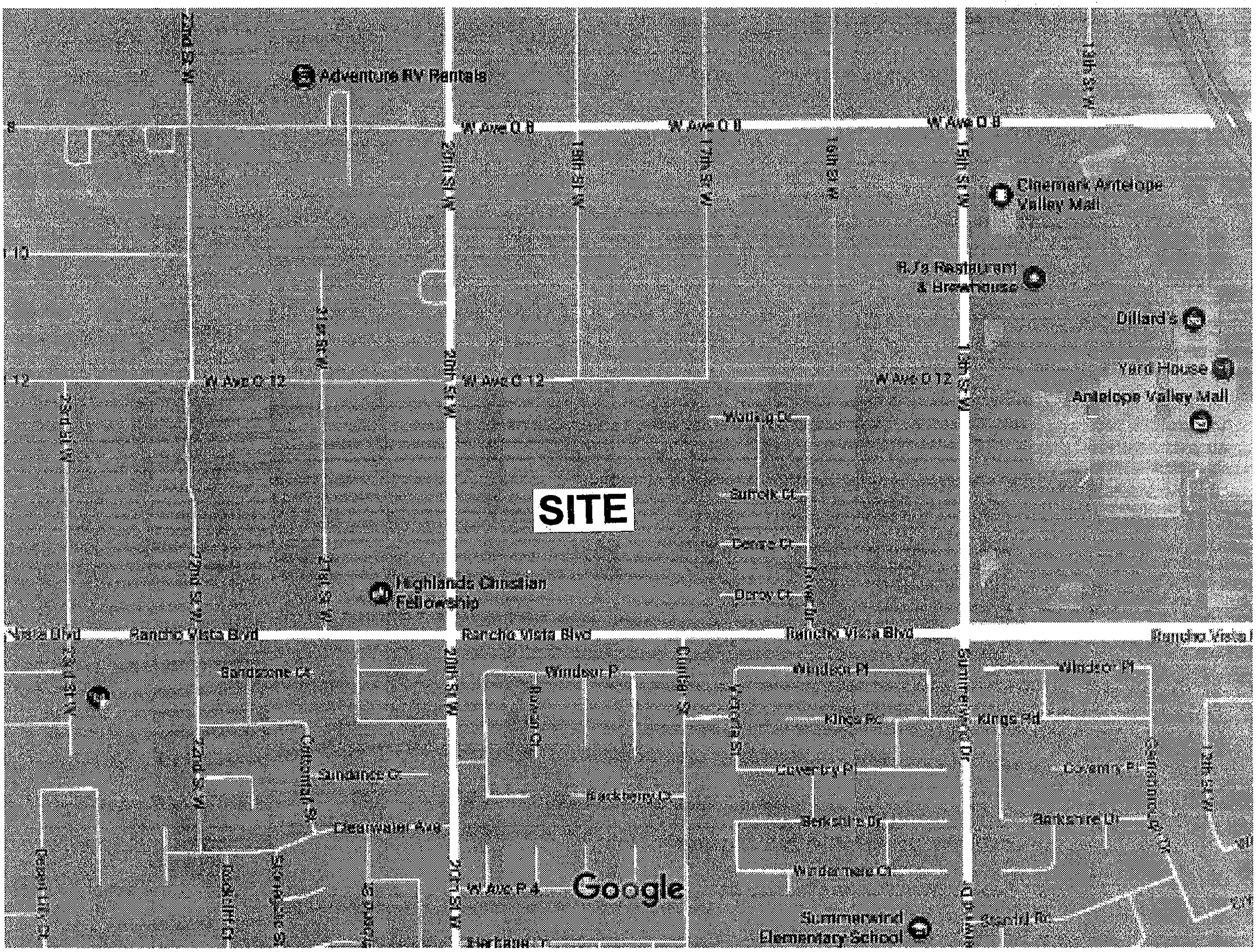
The acoustical code requirements are minimal acceptable standards. Compliance with Building Department acoustical criteria does not require, guarantee or even imply that local sound sources will be mitigated to inaudibility. Compliance with an exterior noise limit of 65 dBA CNEL means that exterior noise will remain clearly audible within the mitigated exterior space. Compliance with an interior noise limit of 45 dBA CNEL means that exterior noise sources will remain audible on the interior of a structure.

Due to quality control and other field related problems, the code minimum laboratory rating of STC/IIC 50 for common assemblies does not guarantee that all common assemblies will pass a field test. In fact, there is a 50% chance that half of all laboratory rated STC/IIC 50 common assemblies could fail field tests. An STC 50 rated assembly will produce around 45 dBA of voice reduction in the field. This means that normal conversation in adjoining units will be audible a certain percentage of the time.

Do not misrepresent the degree of exterior to interior or unit to unit acoustical isolation as anything more than meeting code during any phase of this project. Never, ever, use any form of the term "Soundproof" to describe any portion of this project.

EXHIBIT 1
SITE LOCATION

Google Maps



Map data ©2017 Google 500 ft

Google Maps

EXHIBIT 2
AERIAL PHOTO

Imagery ©2017 DigitalGlobe, U.S. Geological Survey, USDA Farm Service Agency, Map data ©2017 Google 200 ft

SINGLE FAMILY RESIDENCES

9.43 GROSS ACRES

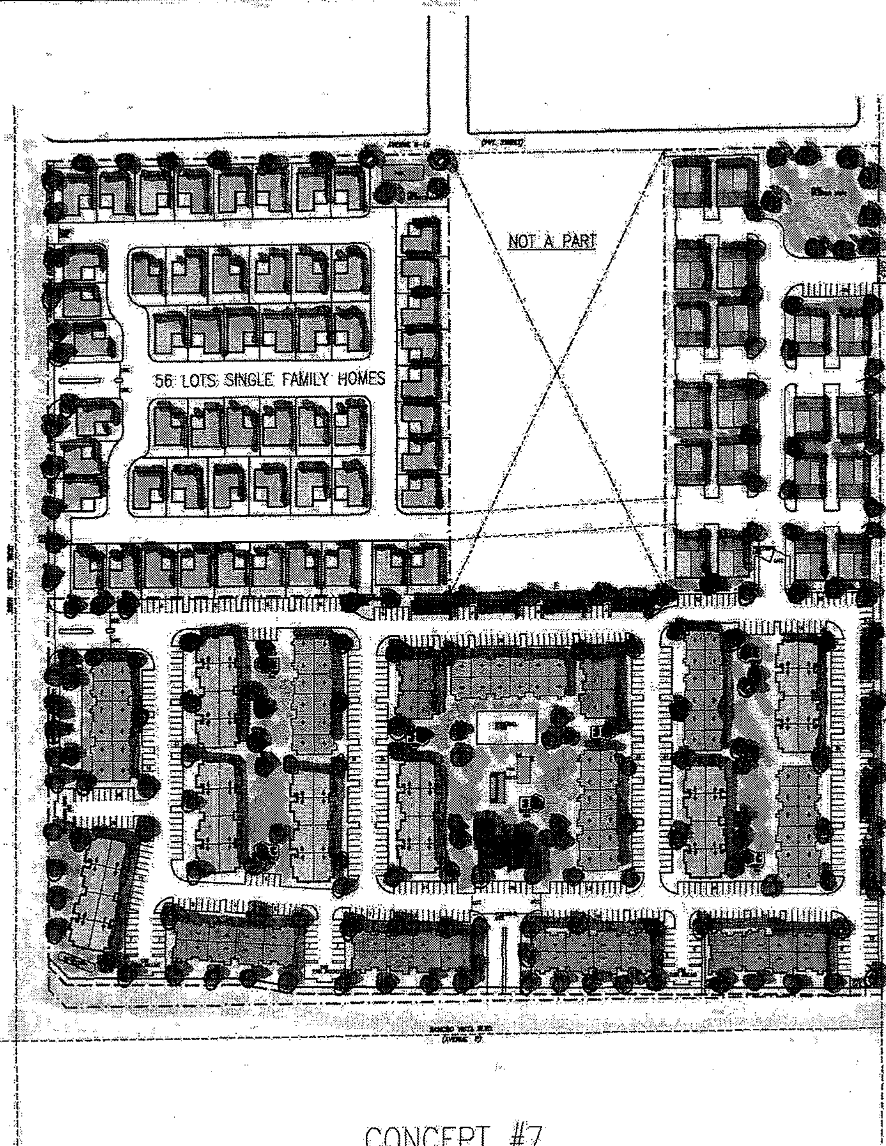
6.2 UNITS PER ACRE

56 UNITS
118 PARKING SPACES REQUIRED

118 DRIVEWAY PARKING SPACES
8 GUEST PARKING SPACES
118 GARAGE PARKING SPACES

244 TOTAL PARKING

SFR CONCEPT PLAN



CONCEPT #7

MULTI-FAMILY TRIPLEX

5.13 ACRES

12.8 UNITS PER ACRE

66 UNITS
116 PARKING SPACES REQUIRED

110 DRIVEWAY PARKING SPACES
12 GUEST PARKING SPACES
110 GARAGE PARKING SPACES

232 TOTAL PARKING

TRIPLEX CONCEPT PLAN

APARTMENTS

18.23 ACRES

17.5 UNITS PER ACRE

320 UNITS
560 PARKING SPACES REQUIRED

587 SURFACE PARKING SPACES
40 GARAGE PARKING SPACES

627 TOTAL PARKING

1 BEDROOM UNITS	112 UNITS	34%
2 BEDROOM UNITS	168 UNITS	52%
3 BEDROOM UNITS	48 UNITS	14%

2 STORY BUILDINGS

24 units

16 units

16 units

20th AND RANCHO
PALMDALE, CALIFORNIA

GREENE TINDALL
DESIGN

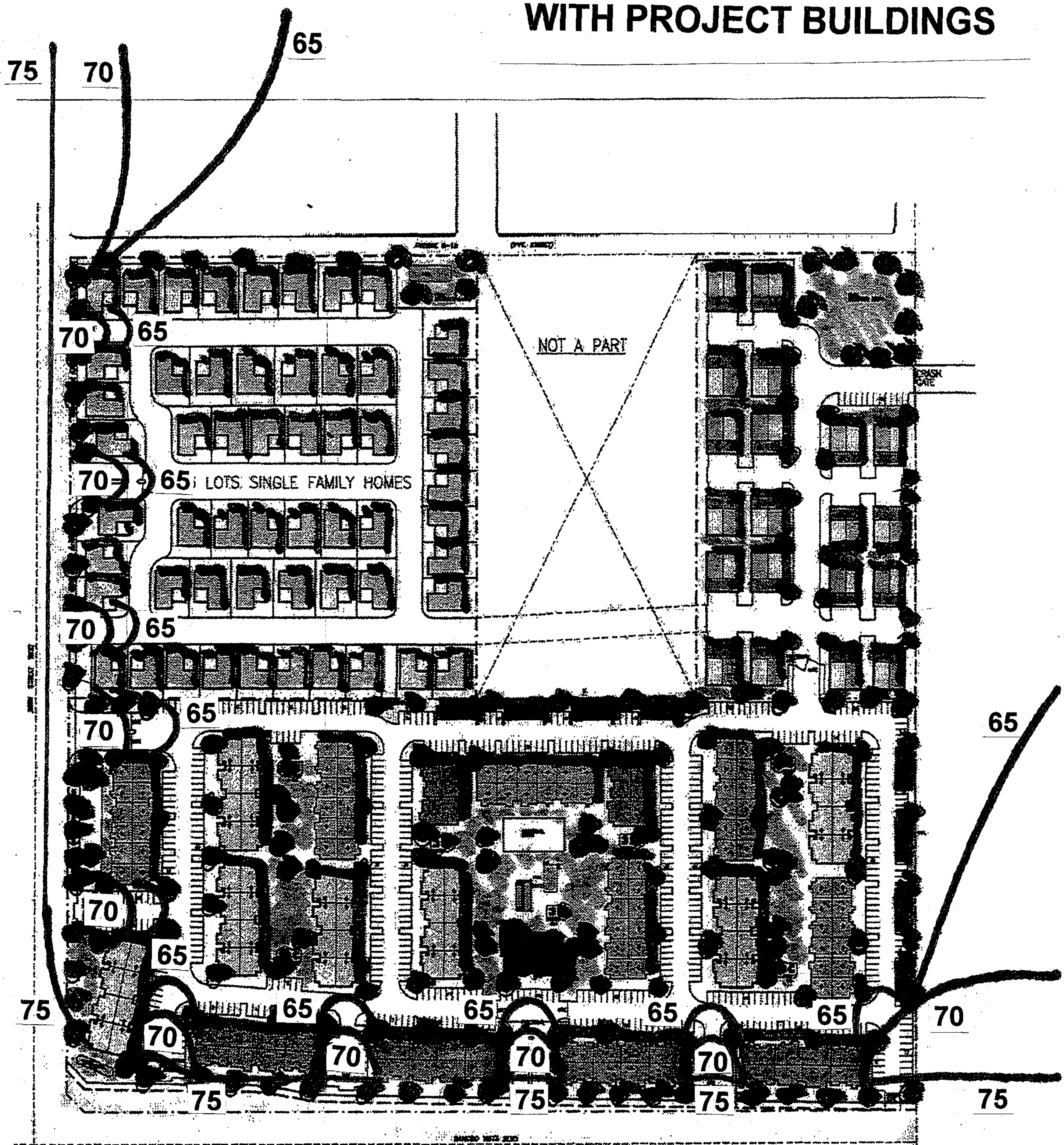
LAS VEGAS, NEVADA

SITE PLAN

S010

EXHIBIT 3
SITE PLAN

EXHIBIT 4
DBA CNEL CONTOURS
WITH PROJECT BUILDINGS



CONCEPT #7

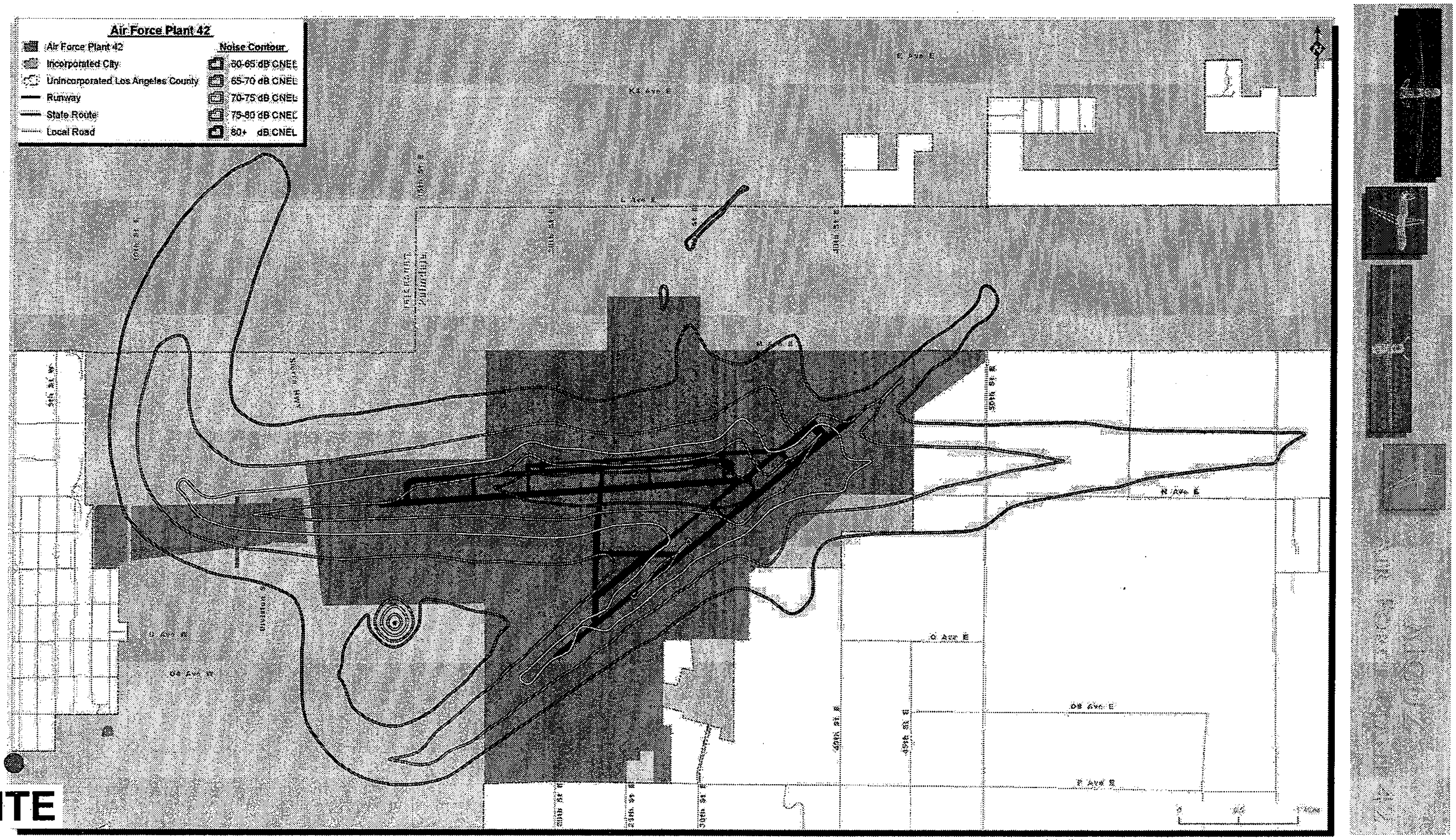


Figure 3-3. Air Force Plant 42 – Community Noise Equivalent Level (CNEL)

EXHIBIT 5
PLANT 42/AIRPORT NOISE CONTOURS

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APPENDIX 1

NOISE RATING METHODOLOGY

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NOISE RATING METHODOLOGY

The A-weighted decibel (dBA) or "A" scale on a sound level meter is typically used for environmental noise measurements because the weighting characteristics of the "A" scale approximate the subjective response of the human ear to a broad frequency band noise source by discriminating against the very low and very high frequencies of the audible sound spectrum.

Since community noise is seldom constant, varying from moment to moment and throughout the day, the "A" weighted noise level needs to be further described to provide meaningful data. The Environmental Protection Agency, the Federal Department of Transportation, several foreign countries and many private consultants are now using three time-exceeded percentile figures to describe noise, which are:

(1) L_{90} is the noise level that is exceeded 90 percent of any sample measurement period (such as 24 hours) and is often used to describe the background or ambient noise level.

(2) L_{50} is the noise level that is exceeded 50 percent of any sample measurement period. It is generally considered to represent the median noise level.

(3) L_{10} is the noise level that is exceeded 10 percent of any sample measurement period. It is a good descriptor of fluctuating noise sources such as vehicular traffic. It indicates the near-maximum noise levels that occur for groups of single noise events. Being related to the subjective annoyance to community noise, the L_{10} is a good design tool in the planning of acoustical barriers.

More recent noise assessment methods are based on the equivalent energy concept where Leq(x) represents the average energy content of a fluctuating noise source over a sample measurement period. The subscript (x) represents the period over which the energy is computed and/or measured. Current practice references the time quantity to either one (1) hour, eight (8) hours, or twenty-four (24) hours. When referenced to one (1) hour, Leq is also called the HNL (Hourly Noise Level).

Since Leq is the summation of the functional products of noise level and duration, many different combinations of noise levels, duration times and time histories can produce similar Leq values. Thus a value of Leq(24) equals 50 means only that the average noise level is 50 dB. During that 24-hour period, there can be times when the noise level is higher than 50 dB and times when it is lower than 50 dB.

If the period of the measurement is only a single event, the energy content is not averaged. The energy expression for a single event is simply the sum of the functional product of the noise level and duration time of the event. This term is called the Le or SENEL (Single Event Noise Exposure Level). The summation of Le values averaged over one hour is Leq(1), over eight hours is Leq(8), over 24 hours is Leq(24), etc.

Leq is further refined into Ldn (Level Day-Night) and CNEL (Community Noise Equivalent Level), where noise that occurs during certain hours of the day are weighted (or penalized) in an attempt to compensate for the general perception that such noise is more annoying during these time periods (typically evening and nighttime hours).

(1) Ldn is the sound level in dBA that corresponds to the average energy content of the noise being measured over a 24-hour period but includes a ten (10) dBA weighting penalty for noise that occurs during the nighttime hours between 10:00 PM and 7:00 AM. The Ldn is a noise rating method recommended by the Environmental Protection Agency because it takes into account those subjectively more annoying noise events that occur during normal sleeping hours.

(2) CNEL is the sound level in dBA that corresponds to the average energy content of the noise being measured over a 24-hour period but includes a five (5) dBA penalty for noise that occurs during the evening hours between 7:00 PM and 10:00 PM, and a ten (10) dBA penalty for noise that occurs during the nighttime hours between 10:00 PM and 7:00 AM. For typical highway vehicular traffic situations, computer analysis has shown that the Ldn and CNEL values correlate within 0.5 dBA.

The percentile figures L_{10}, L_{50} and L_{90} can be directly scaled from a graphical recording of the measured noise sample over a particular time period. These figures can also be measured directly using modern automatic noise measuring equipment. Measurement of the parameters Le, Leq, Ldn and CNEL requires even more sophisticated and correspondingly expensive noise measuring equipment. As a result, engineers have devised ways of estimating Leq (and hence, Ldn) using standard instrumentation and methods.

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APPENDIX 2

FUTURE TRAFFIC NOISE CALCULATIONS

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FHWA RD-77-108 HIGHWAY NOISE PREDICTION MODEL

PROJECT NAME	:20TH AND RANCHO VISTA
SITE LOCATION	:PALMDALE
DESCRIPTION	:RANCHO VISTA PKWY
SITE TYPE	:HARD

INPUT DATA	AUTO	MEDIUM TRUCK	HEAVY TRUCK
SPEED	55	55	55
% DAY	75.51	1.56	.64
% EVENING	12.57	0.09	0.02
% NIGHT	9.34	.19	.08
% VOLUME	100	100	100
VOLUME	32000		

----AVERAGE HOURLY NOISE LEVELS AT 50 FEET----

	DAY	EVENING	NIGHT	24 HOUR	CNEL
AUTO	73.18	71.41	65.35	71.27	74.54
MEDIUM TRK.	66.19	59.82	58.29	63.89	66.96
HEAVY TRK.	66.17	57.14	58.39	63.79	66.86
TOTAL	74.64	71.85	66.81	72.61	75.83

NOISE LEVEL AT SPECIFIED DISTANCES

DISTANCE	CNEL
50	75.83
75	74.07
100	72.82
125	71.85
150	71.06
175	70.39
200	69.81
225	69.30
250	68.84
275	68.42
300	68.05
325	67.70
350	67.38
375	67.08
400	66.80
450	66.29
500	65.83
550	65.41
600	65.04
650	64.69
700	64.37

FHWA RD-77-108 HIGHWAY NOISE PREDICTION MODEL

PROJECT NAME	:20TH AND RANCHO VISTA
SITE LOCATION	:PALMDALE
DESCRIPTION	:20TH STREET WEST
SITE TYPE	:HARD

INPUT DATA	AUTO	MEDIUM TRUCK	HEAVY TRUCK
SPEED	55	55	55
% DAY	75.51	1.56	.64
% EVENING	12.57	0.09	0.02
% NIGHT	9.34	.19	.08
% VOLUME	100	100	100
VOLUME 17000			

----AVERAGE HOURLY NOISE LEVELS AT 50 FEET----

	DAY	EVENING	NIGHT	24 HOUR	CNEL
AUTO	70.43	68.66	62.60	68.53	71.79
MEDIUM TRK.	63.44	57.07	55.55	61.15	64.22
HEAVY TRK.	63.42	54.39	55.64	61.04	64.11
TOTAL	71.89	69.11	64.06	69.87	73.08

NOISE LEVEL AT SPECIFIED DISTANCES

DISTANCE	CNEL
50	73.08
75	71.32
100	70.07
125	69.10
150	68.31
175	67.64
200	67.06
225	66.55
250	66.09
275	65.68
300	65.30
325	64.95
350	64.63
375	64.33
400	64.05
450	63.54
500	63.08
550	62.67
600	62.29
650	61.94
700	61.62

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APPENDIX 3

SOUND WALL HEIGHT CALCULATIONS

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BARRIER NOISE REDUCTION ANALYSIS

PROJECT......20TH STREET WEST DEVELOPMENT
DESCRIPTION..RANCHO VISTA PERIMETER SOUND WALLS (SEATED)
SOURCE ELEVATION....... 0
RECEIVER ELEVATION..... 0
BARRIER ELEVATION...... 0
RECEIVER HEIGHT........ 3
DISTANCE TO SOURCE..... 70
DISTANCE TO RECEIVER... 10
AUTO NOISE LEVEL...... 74.54
M.TRK NOISE LEVEL...... 66.96
H.TRK NOISE LEVEL...... 66.86
SOURCE NOISE LEVEL..... 75.83

ANGULAR CORRECTION(DB) - 0

WALL HEIGHT	NOISE LEVEL	INSERTION LOSS
0.00	75.83	0.00
1.00	75.83	0.00
2.00	75.83	0.00
3.00	71.83	4.00
4.00	69.91	5.92
5.00	68.86	6.97
6.00	67.46	8.36
7.00	66.01	9.82
8.00	64.68	11.15
9.00	63.52	12.30
10.00	62.52	13.30
11.00	61.66	14.17
12.00	60.90	14.93

BARRIER NOISE REDUCTION ANALYSIS

PROJECT......20TH STREET WEST DEVELOPMENT
DESCRIPTION..RANCHO VISTA FIRST FLR PATIO WALLS (SEATED)
SOURCE ELEVATION....... 0
RECEIVER ELEVATION..... 0
BARRIER ELEVATION...... 0
RECEIVER HEIGHT........ 3
DISTANCE TO SOURCE..... 80
DISTANCE TO RECEIVER... 5
AUTO NOISE LEVEL...... 74.54
M.TRK NOISE LEVEL...... 66.96
H.TRK NOISE LEVEL...... 66.86
SOURCE NOISE LEVEL..... 75.83

ANGULAR CORRECTION(DB) - 0

WALL HEIGHT	NOISE LEVEL	INSERTION LOSS
0.00	75.83	0.00
1.00	75.83	0.00
2.00	75.83	0.00
3.00	71.86	3.97
4.00	69.67	6.16
5.00	68.00	7.82
6.00	66.08	9.74
7.00	64.42	11.41
8.00	63.07	12.76
9.00	61.97	13.86
10.00	61.05	14.77

BARRIER NOISE REDUCTION ANALYSIS

PROJECT......20TH STREET WEST DEVELOPMENT
DESCRIPTION..RANCHO VISTA SECOND FLR BALCONY WALLS (SEATED)
SOURCE ELEVATION....... 0
RECEIVER ELEVATION..... 10
BARRIER ELEVATION...... 10
RECEIVER HEIGHT........ 3
DISTANCE TO SOURCE..... 80
DISTANCE TO RECEIVER... 5
AUTO NOISE LEVEL...... 74.54
M.TRK NOISE LEVEL...... 66.96
H.TRK NOISE LEVEL...... 66.86
SOURCE NOISE LEVEL..... 75.83

ANGULAR CORRECTION(DB) - 0

WALL HEIGHT	NOISE LEVEL	INSERTION LOSS
0.00	75.83	0.00
1.00	75.83	0.00
2.00	75.83	0.00
3.00	70.26	5.57
4.00	68.76	7.07
5.00	66.78	9.05
6.00	64.92	10.90
7.00	63.40	12.43
8.00	62.17	13.66

BARRIER NOISE REDUCTION ANALYSIS

PROJECT......20TH STREET WEST DEVELOPMENT
DESCRIPTION..20TH STREET PERIMETER WALLS (SEATED)
SOURCE ELEVATION....... 0
RECEIVER ELEVATION..... 0
BARRIER ELEVATION...... 0
RECEIVER HEIGHT........ 3
DISTANCE TO SOURCE..... 50
DISTANCE TO RECEIVER... 10
AUTO NOISE LEVEL...... 71.79
M.TRK NOISE LEVEL...... 64.22
H.TRK NOISE LEVEL...... 64.11
SOURCE NOISE LEVEL..... 73.08

ANGULAR CORRECTION(DB) - 0

WALL HEIGHT	NOISE LEVEL	INSERTION LOSS
0.00	73.08	0.00
1.00	73.08	0.00
2.00	73.08	0.00
3.00	69.04	4.04
4.00	67.08	6.00
5.00	65.95	7.13
6.00	64.51	8.57
7.00	63.04	10.04
8.00	61.70	11.38
9.00	60.54	12.54
10.00	59.53	13.54
11.00	58.66	14.41
12.00	57.90	15.18

BARRIER NOISE REDUCTION ANALYSIS

PROJECT......20TH STREET WEST DEVELOPMENT
DESCRIPTION..20TH ST WEST FIRST FLR PATIO WALLS (SEATED)
SOURCE ELEVATION....... 0
RECEIVER ELEVATION..... 0
BARRIER ELEVATION...... 0
RECEIVER HEIGHT........ 3
DISTANCE TO SOURCE..... 100
DISTANCE TO RECEIVER... 5
AUTO NOISE LEVEL...... 71.79
M.TRK NOISE LEVEL...... 64.22
H.TRK NOISE LEVEL...... 64.11
SOURCE NOISE LEVEL..... 73.08

ANGULAR CORRECTION(DB) - 0

WALL HEIGHT	NOISE LEVEL	INSERTION LOSS
0.00	73.08	0.00
1.00	73.08	0.00
2.00	73.08	0.00
3.00	69.12	3.96
4.00	66.94	6.14
5.00	65.32	7.76
6.00	63.41	9.67
7.00	61.75	11.33
8.00	60.40	12.68
9.00	59.30	13.78
10.00	58.38	14.69

BARRIER NOISE REDUCTION ANALYSIS

PROJECT......20TH STREET WEST DEVELOPMENT
DESCRIPTION..20TH ST WEST 2ND FLR BALCONY WALLS (SEATED)
SOURCE ELEVATION....... 0
RECEIVER ELEVATION..... 10
BARRIER ELEVATION...... 10
RECEIVER HEIGHT........ 3
DISTANCE TO SOURCE..... 100
DISTANCE TO RECEIVER... 5
AUTO NOISE LEVEL...... 71.79
M.TRK NOISE LEVEL...... 64.22
H.TRK NOISE LEVEL...... 64.11
SOURCE NOISE LEVEL..... 73.08

ANGULAR CORRECTION(DB) - 0

WALL HEIGHT	NOISE LEVEL	INSERTION LOSS
0.00	73.08	0.00
1.00	73.08	0.00
2.00	73.08	0.00
3.00	67.70	5.38
4.00	66.26	6.82
5.00	64.33	8.75
6.00	62.45	10.63
7.00	60.90	12.18
8.00	59.65	13.43

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APPENDIX 4

INTERIOR NOISE REDUCTION CALCULATIONS

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WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME MULTI-FAMILY BEDROOM + STC = 24

FLOOR AREA 152

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	40		41	0.00410
EXT.WALL 2	43		104	0.00521
EXT.WALL 3	50		0	0.00000
INT.WALL			272	
WINDOW 1	22	.05	40	0.25238
WINDOW 2	25	.05	16	0.05060
WINDOW 3	32	.05	0	0.00000
SGD	22	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	40	.04	152	0.01520
FLOOR		.6	152	
ET*S				0.32749
-10LOG(ET*S)				4.8
10LOGA				20.5
NOISE REDUCTION				19.4

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME MULTI-FAMILY BEDROOM + STC = 26

FLOOR AREA 152

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	40		41	0.00410
EXT.WALL 2	43		104	0.00521
EXT.WALL 3	50		0	0.00000
INT.WALL			272	
WINDOW 1	24	.05	40	0.15924
WINDOW 2	27	.05	16	0.03192
WINDOW 3	34	.05	0	0.00000
SGD	24	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	40	.04	152	0.01520
FLOOR		.6	152	
ET*S				0.21568
-10LOG(ET*S)				6.7
10LOGA				20.5
NOISE REDUCTION				21.2

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME MULTI-FAMILY BEDROOM + STC = 28

FLOOR AREA 152

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	40		41	0.00410
EXT.WALL 2	43		104	0.00521
EXT.WALL 3	50		0	0.00000
INT.WALL			272	
WINDOW 1	26	.05	40	0.10048
WINDOW 2	29	.05	16	0.02014
WINDOW 3	36	.05	0	0.00000
SGD	26	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	40	.04	152	0.01520
FLOOR		.6	152	
ET*S				0.14513
-10LOG(ET*S)				8.4
10LOGA				20.5
NOISE REDUCTION				22.9

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME MULTI-FAMILY BEDROOM + STC = 30

FLOOR AREA 152

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	40		41	0.00410
EXT.WALL 2	43		104	0.00521
EXT.WALL 3	50		0	0.00000
INT.WALL			272	
WINDOW 1	28	.05	40	0.06340
WINDOW 2	31	.05	16	0.01271
WINDOW 3	38	.05	0	0.00000
SGD	28	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	40	.04	152	0.01520
FLOOR		.6	152	
ET*S				0.10062
-10LOG(ET*S)				10.0
10LOGA				20.5
NOISE REDUCTION				24.5

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME MULTI-FAMILY BEDROOM + STC = 32

FLOOR AREA 152

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	40		41	0.00410
EXT.WALL 2	43		104	0.00521
EXT.WALL 3	50		0	0.00000
INT.WALL			272	
WINDOW 1	30	.05	40	0.04000
WINDOW 2	33	.05	16	0.00802
WINDOW 3	40	.05	0	0.00000
SGD	30	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	40	.04	152	0.01520
FLOOR		.6	152	
ET*S				0.07253
-10LOG(ET*S)				11.4
10LOGA				20.5
NOISE REDUCTION				25.9

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME MULTI-FAMILY BEDROOM + STC = 34

FLOOR AREA 152

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	40		41	0.00410
EXT.WALL 2	43		104	0.00521
EXT.WALL 3	50		0	0.00000
INT.WALL			272	
WINDOW 1	32	.05	40	0.02524
WINDOW 2	35	.05	16	0.00506
WINDOW 3	42	.05	0	0.00000
SGD	32	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	40	.04	152	0.01520
FLOOR		.6	152	
ET*S				0.05481
-10LOG(ET*S)				12.6
10LOGA				20.5
NOISE REDUCTION				27.1

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME MULTI-FAMILY BEDROOM + STC = 36

FLOOR AREA 152

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	40		41	0.00410
EXT.WALL 2	43		104	0.00521
EXT.WALL 3	50		0	0.00000
INT.WALL			272	
WINDOW 1	34	.05	40	0.01592
WINDOW 2	37	.05	16	0.00319
WINDOW 3	44	.05	0	0.00000
SGD	34	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	40	.04	152	0.01520
FLOOR		.6	152	
ET*S				0.04363
-10LOG(ET*S)				13.6
10LOGA				20.5
NOISE REDUCTION				28.1

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME MULTI-FAMILY BEDROOM + STC = 38

FLOOR AREA 152

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	40		41	0.00410
EXT.WALL 2	43		104	0.00521
EXT.WALL 3	50		0	0.00000
INT.WALL			272	
WINDOW 1	36	.05	40	0.01005
WINDOW 2	39	.05	16	0.00201
WINDOW 3	46	.05	0	0.00000
SGD	36	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	40	.04	152	0.01520
FLOOR		.6	152	
ET*S				0.03657
-10LOG(ET*S)				14.4
10LOGA				20.5
NOISE REDUCTION				28.9

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME MULTI-FAMILY LIVING ROOM + STC = 24

FLOOR AREA 144

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	40		71	0.00710
EXT.WALL 2	43		0	0.00000
EXT.WALL 3	50		0	0.00000
INT.WALL			324	
WINDOW 1	22	.05	40	0.25238
WINDOW 2	25	.05	0	0.00000
WINDOW 3	32	.05	0	0.00000
SGD	22	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	40	.04	144	0.01440
FLOOR		.6	144	
ET*S				0.27388
-10LOG(ET*S)				5.6
10LOGA				20.5
NOISE REDUCTION				20.1

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME MULTI-FAMILY LIVING ROOM + STC = 26

FLOOR AREA 144

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	40		71	0.00710
EXT.WALL 2	43		0	0.00000
EXT.WALL 3	50		0	0.00000
INT.WALL			324	
WINDOW 1	24	.05	40	0.15924
WINDOW 2	27	.05	0	0.00000
WINDOW 3	34	.05	0	0.00000
SGD	24	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	40	.04	144	0.01440
FLOOR		.6	144	
ET*S				0.18074
-10LOG(ET*S)				7.4
10LOGA				20.5
NOISE REDUCTION				21.9

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME MULTI-FAMILY LIVING ROOM + STC = 28

FLOOR AREA 144

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	40		71	0.00710
EXT.WALL 2	43		0	0.00000
EXT.WALL 3	50		0	0.00000
INT.WALL			324	
WINDOW 1	26	.05	40	0.10048
WINDOW 2	29	.05	0	0.00000
WINDOW 3	36	.05	0	0.00000
SGD	26	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	40	.04	144	0.01440
FLOOR		.6	144	
ET*S				0.12198
-10LOG(ET*S)				9.1
10LOGA				20.5
NOISE REDUCTION				23.6

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME MULTI-FAMILY LIVING ROOM + STC = 30

FLOOR AREA 144

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	40		71	0.00710
EXT.WALL 2	43		0	0.00000
EXT.WALL 3	50		0	0.00000
INT.WALL			324	
WINDOW 1	28	.05	40	0.06340
WINDOW 2	31	.05	0	0.00000
WINDOW 3	38	.05	0	0.00000
SGD	28	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	40	.04	144	0.01440
FLOOR		.6	144	
ET*S				0.08490
-10LOG(ET*S)				10.7
10LOGA				20.5
NOISE REDUCTION				25.2

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME MULTI-FAMILY LIVING ROOM + STC = 32

FLOOR AREA 144

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	40		71	0.00710
EXT.WALL 2	43		0	0.00000
EXT.WALL 3	50		0	0.00000
INT.WALL			324	
WINDOW 1	30	.05	40	0.04000
WINDOW 2	33	.05	0	0.00000
WINDOW 3	40	.05	0	0.00000
SGD	30	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	40	.04	144	0.01440
FLOOR		.6	144	
ET*S				0.06150
-10LOG(ET*S)				12.1
10LOGA				20.5
NOISE REDUCTION				26.6

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME MULTI-FAMILY LIVING ROOM + STC = 34

FLOOR AREA 144

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	40		71	0.00710
EXT.WALL 2	43		0	0.00000
EXT.WALL 3	50		0	0.00000
INT.WALL			324	
WINDOW 1	32	.05	40	0.02524
WINDOW 2	35	.05	0	0.00000
WINDOW 3	42	.05	0	0.00000
SGD	32	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	40	.04	144	0.01440
FLOOR		.6	144	
ET*S				0.04674
-10LOG(ET*S)				13.3
10LOGA				20.5
NOISE REDUCTION				27.8

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME MULTI-FAMILY LIVING ROOM + STC = 36

FLOOR AREA 144

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	40		71	0.00710
EXT.WALL 2	43		0	0.00000
EXT.WALL 3	50		0	0.00000
INT.WALL			324	
WINDOW 1	34	.05	40	0.01592
WINDOW 2	37	.05	0	0.00000
WINDOW 3	44	.05	0	0.00000
SGD	34	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	40	.04	144	0.01440
FLOOR		.6	144	
ET*S				0.03742
-10LOG(ET*S)				14.3
10LOGA				20.5
NOISE REDUCTION				28.7

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME MULTI-FAMILY LIVING ROOM + STC = 38

FLOOR AREA 144

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	40		71	0.00710
EXT.WALL 2	43		0	0.00000
EXT.WALL 3	50		0	0.00000
INT.WALL			324	
WINDOW 1	36	.05	40	0.01005
WINDOW 2	39	.05	0	0.00000
WINDOW 3	46	.05	0	0.00000
SGD	36	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	40	.04	144	0.01440
FLOOR		.6	144	
ET*S				0.03155
-10LOG(ET*S)				15.0
10LOGA				20.5
NOISE REDUCTION				29.5

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME SINGLE FAMILY BEDROOM + STC = 24

FLOOR AREA 138

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	40		88	0.00880
EXT.WALL 2	43		99	0.00496
EXT.WALL 3	50		0	0.00000
INT.WALL			212	
WINDOW 1	22	.05	25	0.15774
WINDOW 2	25	.05	0	0.00000
WINDOW 3	32	.05	0	0.00000
SGD	22	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	40	.04	138	0.01380
FLOOR		.6	138	
ET*S				0.18530
-10LOG(ET*S)				7.3
10LOGA				20.1
NOISE REDUCTION				21.4

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME SINGLE FAMILY BEDROOM + STC = 26

FLOOR AREA 138

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	40		88	0.00880
EXT.WALL 2	43		99	0.00496
EXT.WALL 3	50		0	0.00000
INT.WALL			212	
WINDOW 1	24	.05	25	0.09953
WINDOW 2	27	.05	0	0.00000
WINDOW 3	34	.05	0	0.00000
SGD	24	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	40	.04	138	0.01380
FLOOR		.6	138	
ET*S				0.12709
-10LOG(ET*S)				9.0
10LOGA				20.1
NOISE REDUCTION				23.1

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME SINGLE FAMILY BEDROOM + STC = 28

FLOOR AREA 138

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	40		88	0.00880
EXT.WALL 2	43		99	0.00496
EXT.WALL 3	50		0	0.00000
INT.WALL			212	
WINDOW 1	26	.05	25	0.06280
WINDOW 2	29	.05	0	0.00000
WINDOW 3	36	.05	0	0.00000
SGD	26	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	40	.04	138	0.01380
FLOOR		.6	138	
ET*S				0.09036
-10LOG(ET*S)				10.4
10LOGA				20.1
NOISE REDUCTION				24.6

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME SINGLE FAMILY BEDROOM + STC = 30

FLOOR AREA 138

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	40		88	0.00880
EXT.WALL 2	43		99	0.00496
EXT.WALL 3	50		0	0.00000
INT.WALL			212	
WINDOW 1	28	.05	25	0.03962
WINDOW 2	31	.05	0	0.00000
WINDOW 3	38	.05	0	0.00000
SGD	28	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	40	.04	138	0.01380
FLOOR		.6	138	
ET*S				0.06718
-10LOG(ET*S)				11.7
10LOGA				20.1
NOISE REDUCTION				25.8

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME SINGLE FAMILY BEDROOM + STC = 32

FLOOR AREA 138

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	40		88	0.00880
EXT.WALL 2	43		99	0.00496
EXT.WALL 3	50		0	0.00000
INT.WALL			212	
WINDOW 1	30	.05	25	0.02500
WINDOW 2	33	.05	0	0.00000
WINDOW 3	40	.05	0	0.00000
SGD	30	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	40	.04	138	0.01380
FLOOR		.6	138	
ET*S				0.05256
-10LOG(ET*S)				12.8
10LOGA				20.1
NOISE REDUCTION				26.9

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME SINGLE FAMILY BEDROOM + STC = 34

FLOOR AREA 138

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	40		88	0.00880
EXT.WALL 2	43		99	0.00496
EXT.WALL 3	50		0	0.00000
INT.WALL			212	
WINDOW 1	32	.05	25	0.01577
WINDOW 2	35	.05	0	0.00000
WINDOW 3	42	.05	0	0.00000
SGD	32	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	40	.04	138	0.01380
FLOOR		.6	138	
ET*S				0.04334
-10LOG(ET*S)				13.6
10LOGA				20.1
NOISE REDUCTION				27.7

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME SINGLE FAMILY BEDROOM + STC = 36

FLOOR AREA 138

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	40		88	0.00880
EXT.WALL 2	43		99	0.00496
EXT.WALL 3	50		0	0.00000
INT.WALL			212	
WINDOW 1	34	.05	25	0.00995
WINDOW 2	37	.05	0	0.00000
WINDOW 3	44	.05	0	0.00000
SGD	34	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	40	.04	138	0.01380
FLOOR		.6	138	
ET*S				0.03751
-10LOG(ET*S)				14.3
10LOGA				20.1
NOISE REDUCTION				28.4

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME SINGLE FAMILY BEDROOM + STC = 38

FLOOR AREA 138

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	40		88	0.00880
EXT.WALL 2	43		99	0.00496
EXT.WALL 3	50		0	0.00000
INT.WALL			212	
WINDOW 1	36	.05	25	0.00628
WINDOW 2	39	.05	0	0.00000
WINDOW 3	46	.05	0	0.00000
SGD	36	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	40	.04	138	0.01380
FLOOR		.6	138	
ET*S				0.03384
-10LOG(ET*S)				14.7
10LOGA				20.1
NOISE REDUCTION				28.8

CHRISTOPHER JEAN & ASSOCIATES, INC.
ACOUSTICAL CONSULTING SERVICES

APPENDIX 5

INTERIOR NOISE REDUCTION CALCULATIONS WITH EXTERIOR WALL UPGRADES AND BAFFLED ATTIC VENTS

P. O. BOX 2325 • FULLERTON, CALIFORNIA • 92837
PHONE: 714-805-0115

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME MULTI-FAM BEDROOM W/ UPGRADE WALLS/ROOF + STC = 24

FLOOR AREA 152

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	50		41	0.00041
EXT.WALL 2	53		104	0.00052
EXT.WALL 3	60		0	0.00000
INT.WALL			272	
WINDOW 1	22	.05	40	0.25238
WINDOW 2	25	.05	16	0.05060
WINDOW 3	32	.05	0	0.00000
SGD	22	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	50	.04	152	0.00152
FLOOR		.6	152	
ET*S				0.30543
-10LOG(ET*S)				5.2
10LOGA				20.5
NOISE REDUCTION				19.7

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME MULTI-FAM BEDROOM W/ UPGRADE WALLS/ROOF + STC = 26

FLOOR AREA 152

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	50		41	0.00041
EXT.WALL 2	53		104	0.00052
EXT.WALL 3	60		0	0.00000
INT.WALL			272	
WINDOW 1	24	.05	40	0.15924
WINDOW 2	27	.05	16	0.03192
WINDOW 3	34	.05	0	0.00000
SGD	24	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	50	.04	152	0.00152
FLOOR		.6	152	
ET*S				0.19362
-10LOG(ET*S)				7.1
10LOGA				20.5
NOISE REDUCTION				21.7

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME MULTI-FAM BEDROOM W/ UPGRADE WALLS/ROOF + STC = 28

FLOOR AREA 152

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	50		41	0.00041
EXT.WALL 2	53		104	0.00052
EXT.WALL 3	60		0	0.00000
INT.WALL			272	
WINDOW 1	26	.05	40	0.10048
WINDOW 2	29	.05	16	0.02014
WINDOW 3	36	.05	0	0.00000
SGD	26	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	50	.04	152	0.00152
FLOOR		.6	152	
ET*S				0.12307
-10LOG(ET*S)				9.1
10LOGA				20.5
NOISE REDUCTION				23.6

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME MULTI-FAM BEDROOM W/ UPGRADE WALLS/ROOF + STC = 30

FLOOR AREA 152

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	50		41	0.00041
EXT.WALL 2	53		104	0.00052
EXT.WALL 3	60		0	0.00000
INT.WALL			272	
WINDOW 1	28	.05	40	0.06340
WINDOW 2	31	.05	16	0.01271
WINDOW 3	38	.05	0	0.00000
SGD	28	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	50	.04	152	0.00152
FLOOR		.6	152	
ET*S				0.07856
-10LOG(ET*S)				11.0
10LOGA				20.5
NOISE REDUCTION				25.6

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME MULTI-FAM BEDROOM W/ UPGRADE WALLS/ROOF + STC = 32

FLOOR AREA 152

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	50		41	0.00041
EXT.WALL 2	53		104	0.00052
EXT.WALL 3	60		0	0.00000
INT.WALL			272	
WINDOW 1	30	.05	40	0.04000
WINDOW 2	33	.05	16	0.00802
WINDOW 3	40	.05	0	0.00000
SGD	30	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	50	.04	152	0.00152
FLOOR		.6	152	
ET*S				0.05047
-10LOG(ET*S)				13.0
10LOGA				20.5
NOISE REDUCTION				27.5

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME MULTI-FAM BEDROOM W/ UPGRADE WALLS/ROOF + STC = 34

FLOOR AREA 152

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	50		41	0.00041
EXT.WALL 2	53		104	0.00052
EXT.WALL 3	60		0	0.00000
INT.WALL			272	
WINDOW 1	32	.05	40	0.02524
WINDOW 2	35	.05	16	0.00506
WINDOW 3	42	.05	0	0.00000
SGD	32	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	50	.04	152	0.00152
FLOOR		.6	152	
ET*S				0.03275
-10LOG(ET*S)				14.8
10LOGA				20.5
NOISE REDUCTION				29.4

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME MULTI-FAM BEDROOM W/ UPGRADE WALLS/ROOF + STC = 36

FLOOR AREA 152

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	50		41	0.00041
EXT.WALL 2	53		104	0.00052
EXT.WALL 3	60		0	0.00000
INT.WALL			272	
WINDOW 1	34	.05	40	0.01592
WINDOW 2	37	.05	16	0.00319
WINDOW 3	44	.05	0	0.00000
SGD	34	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	50	.04	152	0.00152
FLOOR		.6	152	
ET*S				0.02157
-10LOG(ET*S)				16.7
10LOGA				20.5
NOISE REDUCTION				31.2

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME MULTI-FAM BEDROOM W/ UPGRADE WALLS/ROOF + STC = 38

FLOOR AREA 152

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	50		41	0.00041
EXT.WALL 2	53		104	0.00052
EXT.WALL 3	60		0	0.00000
INT.WALL			272	
WINDOW 1	36	.05	40	0.01005
WINDOW 2	39	.05	16	0.00201
WINDOW 3	46	.05	0	0.00000
SGD	36	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	50	.04	152	0.00152
FLOOR		.6	152	
ET*S				0.01451
-10LOG(ET*S)				18.4
10LOGA				20.5
NOISE REDUCTION				32.9

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME MULTI-FAM LIVING W/ UPGRADE WALLS/ROOF + STC = 24

FLOOR AREA 144

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	50		71	0.00071
EXT.WALL 2	53		0	0.00000
EXT.WALL 3	60		0	0.00000
INT.WALL			324	
WINDOW 1	22	.05	40	0.25238
WINDOW 2	25	.05	0	0.00000
WINDOW 3	32	.05	0	0.00000
SGD	22	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	50	.04	144	0.00144
FLOOR		.6	144	
ET*S				0.25453
-10LOG(ET*S)				5.9
10LOGA				20.5
NOISE REDUCTION				20.4

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME MULTI-FAM LIVING W/ UPGRADE WALLS/ROOF + STC = 26

FLOOR AREA 144

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	50		71	0.00071
EXT.WALL 2	53		0	0.00000
EXT.WALL 3	60		0	0.00000
INT.WALL			324	
WINDOW 1	24	.05	40	0.15924
WINDOW 2	27	.05	0	0.00000
WINDOW 3	34	.05	0	0.00000
SGD	24	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	50	.04	144	0.00144
FLOOR		.6	144	
ET*S				0.16139
-10LOG(ET*S)				7.9
10LOGA				20.5
NOISE REDUCTION				22.4

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME MULTI-FAM LIVING W/ UPGRADE WALLS/ROOF + STC = 28

FLOOR AREA 144

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	50		71	0.00071
EXT.WALL 2	53		0	0.00000
EXT.WALL 3	60		0	0.00000
INT.WALL			324	
WINDOW 1	26	.05	40	0.10048
WINDOW 2	29	.05	0	0.00000
WINDOW 3	36	.05	0	0.00000
SGD	26	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	50	.04	144	0.00144
FLOOR		.6	144	
ET*S				0.10263
-10LOG(ET*S)				9.9
10LOGA				20.5
NOISE REDUCTION				24.3

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME MULTI-FAM LIVING W/ UPGRADE WALLS/ROOF + STC = 30

FLOOR AREA 144

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	50		71	0.00071
EXT.WALL 2	53		0	0.00000
EXT.WALL 3	60		0	0.00000
INT.WALL			324	
WINDOW 1	28	.05	40	0.06340
WINDOW 2	31	.05	0	0.00000
WINDOW 3	38	.05	0	0.00000
SGD	28	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	50	.04	144	0.00144
FLOOR		.6	144	
ET*S				0.06555
-10LOG(ET*S)				11.8
10LOGA				20.5
NOISE REDUCTION				26.3

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME MULTI-FAM LIVING W/ UPGRADE WALLS/ROOF + STC = 32

FLOOR AREA 144

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	50		71	0.00071
EXT.WALL 2	53		0	0.00000
EXT.WALL 3	60		0	0.00000
INT.WALL			324	
WINDOW 1	30	.05	40	0.04000
WINDOW 2	33	.05	0	0.00000
WINDOW 3	40	.05	0	0.00000
SGD	30	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	50	.04	144	0.00144
FLOOR		.6	144	
ET*S				0.04215
-10LOG(ET*S)				13.8
10LOGA				20.5
NOISE REDUCTION				28.2

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME MULTI-FAM LIVING W/ UPGRADE WALLS/ROOF + STC = 34

FLOOR AREA 144

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	50		71	0.00071
EXT.WALL 2	53		0	0.00000
EXT.WALL 3	60		0	0.00000
INT.WALL			324	
WINDOW 1	32	.05	40	0.02524
WINDOW 2	35	.05	0	0.00000
WINDOW 3	42	.05	0	0.00000
SGD	32	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	50	.04	144	0.00144
FLOOR		.6	144	
ET*S				0.02739
-10LOG(ET*S)				15.6
10LOGA				20.5
NOISE REDUCTION				30.1

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME MULTI-FAM LIVING W/ UPGRADE WALLS/ROOF + STC = 36

FLOOR AREA 144

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	50		71	0.00071
EXT.WALL 2	53		0	0.00000
EXT.WALL 3	60		0	0.00000
INT.WALL			324	
WINDOW 1	34	.05	40	0.01592
WINDOW 2	37	.05	0	0.00000
WINDOW 3	44	.05	0	0.00000
SGD	34	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	50	.04	144	0.00144
FLOOR		.6	144	
ET*S				0.01807
-10LOG(ET*S)				17.4
10LOGA				20.5
NOISE REDUCTION				31.9

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME MULTI-FAM LIVING W/ UPGRADE WALLS/ROOF + STC = 38

FLOOR AREA 144

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	50		71	0.00071
EXT.WALL 2	53		0	0.00000
EXT.WALL 3	60		0	0.00000
INT.WALL			324	
WINDOW 1	36	.05	40	0.01005
WINDOW 2	39	.05	0	0.00000
WINDOW 3	46	.05	0	0.00000
SGD	36	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	50	.04	144	0.00144
FLOOR		.6	144	
ET*S				0.01220
-10LOG(ET*S)				19.1
10LOGA				20.5
NOISE REDUCTION				33.6

APPENDIX 6

BAFFLED ATTIC VENTS

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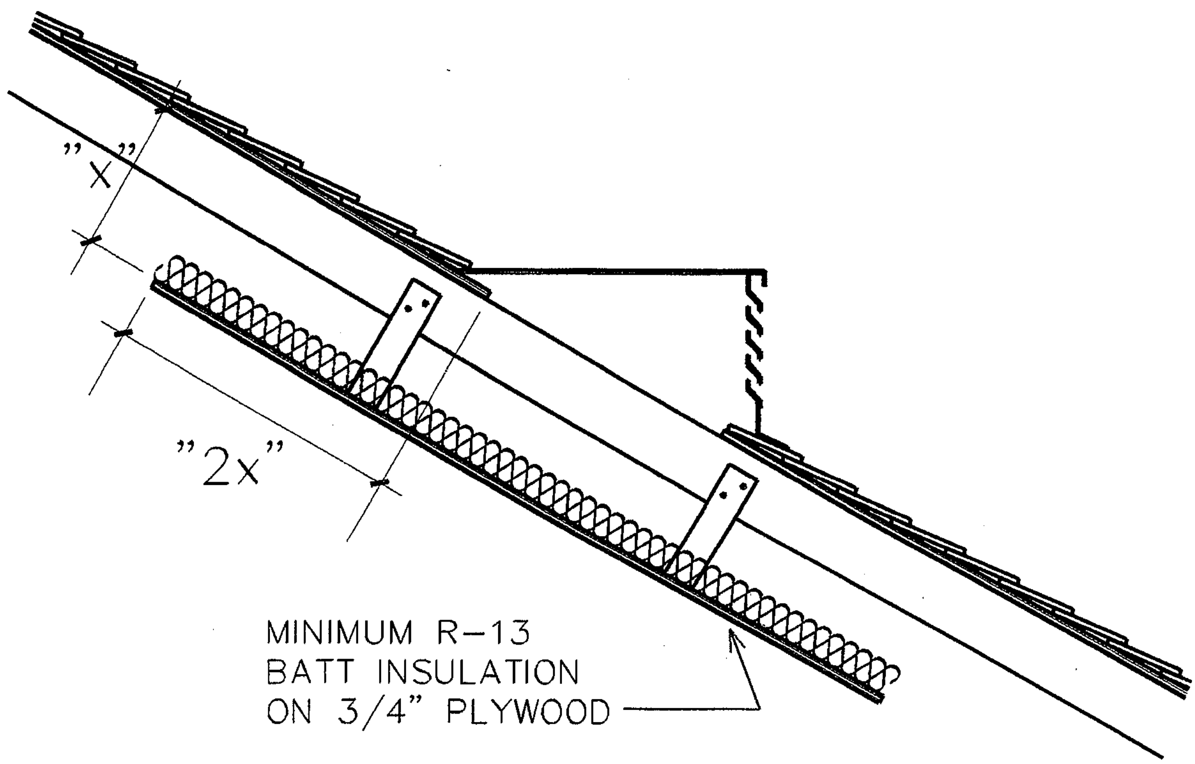
CHRISTOPHER JEAN & ASSOCIATES, INC.

ACOUSTICAL CONSULTING SERVICES



ATTIC VENT BAFFLE AT DORMER VENT

BAFFLE MUST EXTEND BEYOND THE ROOF OPENING TWICE THE DISTANCE BETWEEN THE ROOF SHEATHING AND THE FACE OF THE PLYWOOD BAFFLE IN ALL DIRECTIONS

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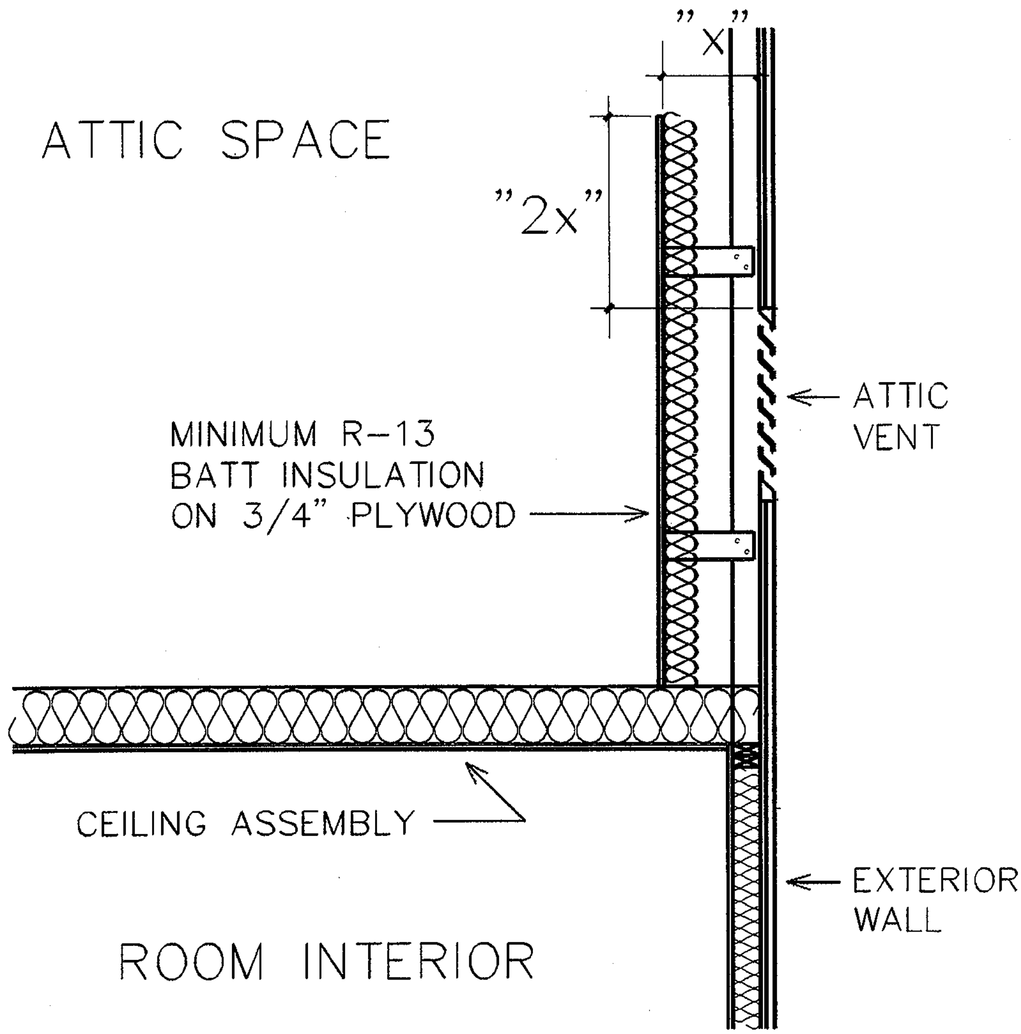

ATTIC VENT BAFFLE AT VERTICAL WALL

BAFFLE MUST EXTEND BEYOND THE VENT OPENING TWICE THE DISTANCE BETWEEN THE SHEAR PANEL/EXTERIOR SIDING AND THE FACE OF THE PLYWOOD BAFFLE IN ALL DIRECTIONS UNLESS THE BAFFLE MEETS THE ROOF OR CEILING FIRST

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APPENDIX 7

PLUMBING AND ELECTRICAL INSTALLATIONS

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PLUMBING NOISE REDUCTION REQUIREMENTS FOR COMPLIANCE WITH THE CALIFORNIA CODE OF REGULATIONS TITLE 24, PART 2, APPENDIX CHAPTER 35

REQUIRED PLUMBING DESIGN FEATURE IN COMON WALL AND FLOOR/CEILING ASSEMBLIES

The plumbing system, by its nature, can degrade the acoustical integrity of a common wall or floor/ceiling assembly. This is primarily due to the fact that the plumbing system, a sound carrier and a sound source, is generally attached to the studs, plates, joists and drywall of a building's walls and floors. In order to alleviate the problem of plumbing system noise, one hundred percent of the plumbing system must be isolated from the building structure (not just at the common assemblies). Special installation requirements are necessary in order to:

(1) reduce the level of noise from the plumbing system, and

(2) isolate the total plumbing system from the building structure.

These special isolation procedures may be accomplished by using an approved commercial isolation system. Hard plastic "isolators" are **NOT** acceptable. Examples of approved commercial isolation systems in order of preference are:

(1) "Acousto-Plumb" ™ system by Specialty Products, Inc. (www.ispproducts.com),

(2) Holdrite Silencer System by Holdrite, Inc. (www.holdrite.com), and

(3) the felt lined series of isolators, clamps and hangers from Tolco, Inc.

Only when appropriate commercial isolation products are not available for unusual applications or extra large pipe sizes, will it be acceptable to use high density, 1/4" thick, 2" wide, adhesive backed felt wrap and/or 1/2" thick pre-formed, self-adhesive foam rubber pipe insulation such as Armaflex or Rubatex. If the felt wrap or pre-formed pipe insulation is used, great care must be taken not to compress the insulation material when strapping or anchoring the attachment points. Use of expanding foam products as plumbing isolation is **strictly prohibited**.

SUPPLY LINES

- All hot and cold water pipes, fittings and valves shall NEVER come in direct contact with either the building structure framing or drywall. Supply lines are to be isolated using Acousto-Plumb, Holdrite Silencer System, Tolco I.S.P. felt lined isolator products, 1/4" high density felt wrap or 1/2" pre-formed pipe insulation. Acousto-Plumb products and installation details can be found at www.lspproducts.com. Holdrite Silencer System products and installation details can be found at www.holdrite.com. Tolco I.S.P. products can be found at www. cooperindustries.com. Installation details for use of felt wrap or pre-formed pipe insulation are available upon request and approval. If felt wrap or pre-formed pipe insulation are used (and only with prior written approval by the acoustical consultant when appropriate commercial isolation products cannot be located), these installation details must be followed to the letter. No deviations from these details will be allowed.

- All sink and shower faucets, spouts and risers shall be isolated with resilient gaskets that are positioned between the faucet, spout or riser and its mounting surface.

- Water supply stub-outs shall be temporarily isolated from the drywall using the Acousto-Sleeve ™ during drywall installation, and then permanently isolated using the Acousto-Scutcheon ™ or resilient caulking and a standard plumbing escutcheon.

- Water pressure shall not exceed 65 psi.

- Shower head flow restrictors shall be used to limit water flow to less than three (3) gallons per minute.

- The pipe stubs commonly installed to combat water hammer are not effective. A commercially produced water hammer device consisting of a bellows, similar to that made by Plumbing Products, Inc., is recommended.

- Sections of the plumbing supply system employing PEX (cross linked polyethylene tubing) do not require acoustical isolation except where it transitions to or from conventional copper lines.

WASTE LINES

- The cavity under plastic or fiberglass tubs and showers shall be packed with fiberglass or spray-on insulation materials and/or lightweight concrete pours. The bottoms of such tubs shall be blocked or supported by lightweight concrete to reduce drumming.

- All waste lines above the slab and at the penetrations of any floor/ceiling assemblies and any walls (including non-common walls) shall be cast iron. The use of ABS waste lines is not recommended. If ABS is used, the entire framing cavity surrounding the ABS pipe shall be completely packed with fiberglass, mineral wool or spray–on adhesive cellulose insulation materials. All elbows below toilet and tub waste outlets shall be isolated from all positioning blocks using carpet padding or high-density 1/4" felt material. The entire framing cavity surrounding these elbows shall be completely packed with fiberglass, mineral wool or spray-on adhesive cellulose insulation materials.

- Waste lines of a diameter greater than two and a half inches (2.5") shall never be installed in a wall framed with less than 2" by 6" studs. Walls framed with 2" by 4" studs simply don't allow sufficient clearance to properly insulate and isolate waste lines and/or avoid pipe contact with the drywall.

Failure to COMPLETELY isolate the plumbing system from the building structure will result in a significant transfer of plumbing noise into the building. Therefore, it is important that all of the above measures and techniques are employed. Collectively, these measures and techniques act as parts of a complete system, each designed to perform a particular function of the total effort. Any circumvention of the function of any one component, whether intentional or not, will ultimately lessen the effectiveness of the entire system. **QUALITY CONTROL IS CRITICAL TO PROPER PLUMBING SYSTEM ISOLATION.**

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ELECTRICAL SYSTEM INSTALLATION NOTES

The following items shall be incorporated into the building plans:

COMMON WALLS

- Electrical outlets, switches, phone jacks, television antennae boxes and computer outlet boxes installed in opposite sides of a common wall shall be offset a minimum of 24" to comply with the fire code. This offset is not needed for acoustical reasons if insulation is used in the framing cavities and Lowry's #10 putty pads or 3M fire pads are applied around the backs and sides of all outlets, switches, phone jacks, etc.
- All electrical outlets, switches, phone jacks, television antennae boxes and computer outlet boxes installed in common walls shall be backed by and Lowry's #10 putty pads, 3M fire pads or equivalent. Pads shall be stapled to the studs to insure that they remain in place indefinitely (the adhesive backing of the pads deteriorates over time).
- Wiring shall avoid crossing over the air gap of common walls. Where unavoidable, wiring crossovers between common wall studs shall include a loop where the depth is equal to its width.
- Electrical panel boxes, fixture boxes or outlet boxes greater than 25 square inches shall be set in raised boxes that do not touch the opposite side of the common wall.

COMMON FLOOR/CEILINGS

- Recessed lighting shall be set in recessed and airtight boxes made of plywood or drywall.
- All other precautions applicable to common wall installations shall also apply to common floor/ceiling installations.

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APPENDIX: G

20th Street West Development
Traffic Impact Study

Prepared for:
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February 2018

EXECUTIVE SUMMARY
Purpose of the Report

The purpose of this Traffic Impact Study (TIS) is to identify and document potential traffic impacts related to the proposed 20th Street West Development in the City of Palmdale. This technical report will also recommend transportation mitigation measures and improvements to address potential project impacts to local transportation facilities.

Project Overview

the proposed project is located on a vacant site at the northeast quadrant of 20th Street West and Rancho Vista Boulevard intersection and will be accessed via two driveways on 20th Street West and Rancho Vista Boulevard respectively. The 20th Street driveway will provide full access to the development where the Rancho Vista Boulevard driveway will be right-in and right-out only. The proposed mixed- use development consists of the following land uses:

- 56 Single family dwelling units
- 66 Multi-family dwelling units
- 320 Apartments

The project trip generation was calculated using the ITE Trip Generation Manual (10th Edition). It is estimated that the project will generate 3,230 total daily trips, 212 AM peak hour trips, and 264 PM peak hour trips. Working closely with City of Palmdale staff, a detailed trip distribution and trip assignment was developed in order to show the unique characteristics of the travel behaviors that exist for the area. Project scenarios and study area were then established in coordination with City staff to determine the potential impact of the project on the local transportation network.

Project Scenarios:

- Existing Conditions (2018)
- Existing with Project Conditions
- Opening Year plus ambient growth (2023)
- Opening Year with Project
- Buildout (2040)
- Buildout with Project

Study area Intersections:

- Rancho Vista and 30th Street W.
- Rancho Vista and 25th Street W.
- Rancho Vista and 20th Street W.
- Rancho Vista and 15th Street W.
- Rancho Vista and A.V. Mall
- Rancho Vista and A.V. Mall/Armfield Avenue
- Rancho Vista and 10th Street W.
- Rancho Vista and Lowe's Drive/Sierra Commons

- Rancho Vista and CA-14 Northbound Off-Ramp
- 10th Street W. and A.V. Mall/Sierra Commons
- 10th Street W. and CA-14 Southbound Off-Ramp
- 10th Street W. and Avenue O-8
- Avenue O-8 and 20th Street W.

Analysis Results and Recommendations

Existing Scenario (2018)
All intersections analyzed under Existing Conditions (2018) are determined to be operating at an acceptable level of service.

Opening Year Scenario (2023)
All intersections analyzed under Opening Year Conditions (Year 2023) are determined to be operating at an acceptable level of service.

Buildout Scenario (2040)
The proposed project would have a significant cumulative traffic related impact under Buildout Conditions (2040) with Project at the following intersections:

- Rancho Vista and 10th Street W. (Intersection 7)
- 10th Street W. and CA-14 Southbound Off-Ramp (Intersection 11)

Project related impacts at Rancho Vista and 10th Street W., and 10th Street W. and CA-14 Southbound Off-Ramp intersections will be fully mitigated with the proposed 10th Street West widening project that is funded by METRO Measure R funds. Delays and LOS at these intersections will be improved to operation levels equal or better than the ones under Buildout (2040) Without Project conditions.

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1.0 PROJECT INTRODUCTION

This traffic impact analysis has been prepared for the 20th Street West Development. The proposed development is located on a vacant site in the City of Palmdale, at the northeast quadrant of 20th Street West and Rancho Vista Boulevard intersection. Access to the project is provided via two driveways on 20th Street West and Rancho Vista Boulevard respectively. The 20th Street driveway will provide full access to the development where the Rancho Vista Boulevard driveway will be right-in and right-out only.

PROJECT DESCRIPTION

The proposed residential development consists of the following land uses:

- 56 Single family dwelling units
- 66 Multi-family dwelling units
- 320 Apartments

Figure 1-1 shows the project site plan.

STUDY AREA

The study area for this project includes those locations that are expected to be affected by this project. The study area intersections were selected, in coordination with the City Engineer, based on the distribution of project traffic within the City of Palmdale. IEG prepared a project traffic study scoping agreement defining the study area which was reviewed and approved by City staff prior to the preparation of this technical report. **Figure 1-2** presents the study area that includes the following key intersections locations:

Intersections

- Rancho Vista and 30th Street W.
- Rancho Vista and 25th Street W.
- Rancho Vista Blvd. & 20th Street W.
- Rancho Vista Blvd. & 15th Street W.
- Rancho Vista Blvd. & A.V. Mall
- Rancho Vista Blvd. & A.V. Mall/Armfield Avenue
- Rancho Vista Blvd. & 10th Street W.
- Rancho Vista Blvd. & Lowe's Drive/Sierra Commons
- Rancho Vista Blvd. & CA-14 Northbound Off-Ramp
- 10th Street W. & A.V. Mall/Sierra Commons
- 10th Street W. & CA-14 Southbound Off-Ramp
- 10th Street W. & Avenue O-8
- Avenue O-8 & 20th Street W.

Turning movement counts were conducted for one weekday during the morning and evening peak hours. The turning movement counts will be utilized in Synchro to determine LOS at all study intersections.

PROJECT TRIP GENERATION

The trip generation is a measure or forecast of the number of trips that begin or end at the project site. The traffic generated is a function of the extent and type of development proposed for the site. These trips will result in some traffic increases on the streets where they occur. Vehicular traffic generation characteristics for projects are estimated based on established rates. These rates identify the probable traffic generation of various land uses based studies of developments in comparable settings. The rates used in this analysis were determined based on rates contained in the *Trip Generation,10th Edition*, published by the Institute of Transportation Engineers (ITE). This document is widely used in Southern California and indicates the probable traffic generation rates for various land uses based upon studies of existing developments in comparable settings. Project ITE average trip generation rates are presented in **Table 1-1**.

Table 1-1
Project Trip Generation Rate

Land Use	Units[1]	ITE LU Code	AM Peak Hour			PM Peak Hour			
			In	Out	Total	In	Out	Total	Daily
Single-Family Detached Housing	DU	210	0.19	0.56	0.74	0.62	0.37	0.99	9.44
Multi-Family Apartments (Low Rise)	DU	220	0.11	0.35	0.46	0.30	0.21	0.56	7.32
Multi-Family Triplex (Mid Rise)	DU	221	0.09	0.27	0.36	0.27	0.17	0.44	5.44

Trip Generation Source: Institute of Transportation Engineers (ITE), Trip Generation Manual, 10th Edition (2017)
[1]DU = Dwelling Units

Table 1-2 summarizes the trip generation based on the square footages associated with the proposed Project. As shown on Table 1-2, the proposed development is anticipated to generate a net total of approximately 3,230 trip-ends per day, with 212 vehicles per hour (VPH) during the AM peak hour and 264 VPH during the PM peak hour.

Table 1-2
Project Trip Generation

Land Use	Intensity	Units[1]	AM Peak Hour			PM Peak Hour			Daily
			In	Out	Total	In	Out	Total	
Residential Component									
Single-Family Detached Housing	56	DU	10	31	41	35	21	55	529
Multi-Family Apartments (Low Rise)	320	DU	34	113	147	95	66	179	2,342
Multi-Family Triplex (Mid Rise)	66	DU	6	18	24	18	11	29	359
TOTAL			**50**	**162**	**212**	**148**	**98**	**264**	**3,230**

Trip Generation Source: Institute of Transportation Engineers (ITE), Trip Generation Manual, 10th Edition (2017)
[1]DU = Dwelling Units

PROJECT DISTRIBUTION AND ASSIGNMENT

Trip distribution and assignment is the process of identifying the probable destinations, directions and traffic routes that project related traffic will likely affect. Trip distribution and assignment information can be estimated from observed traffic patterns, experience or through use of a computerized travel forecast model. Once the proposed development trips have been estimated, they are assigned to the study area network. For this development, the project distribution was developed, in coordination with City staff, based on the land use characteristics of the proposed project and surrounding area, anticipated travel patterns to and from the project site and existing travel patterns within the study area.

Figures 1-3 through 1-4 show trip distribution/assignment and project peak hour intersection turning movement volumes.

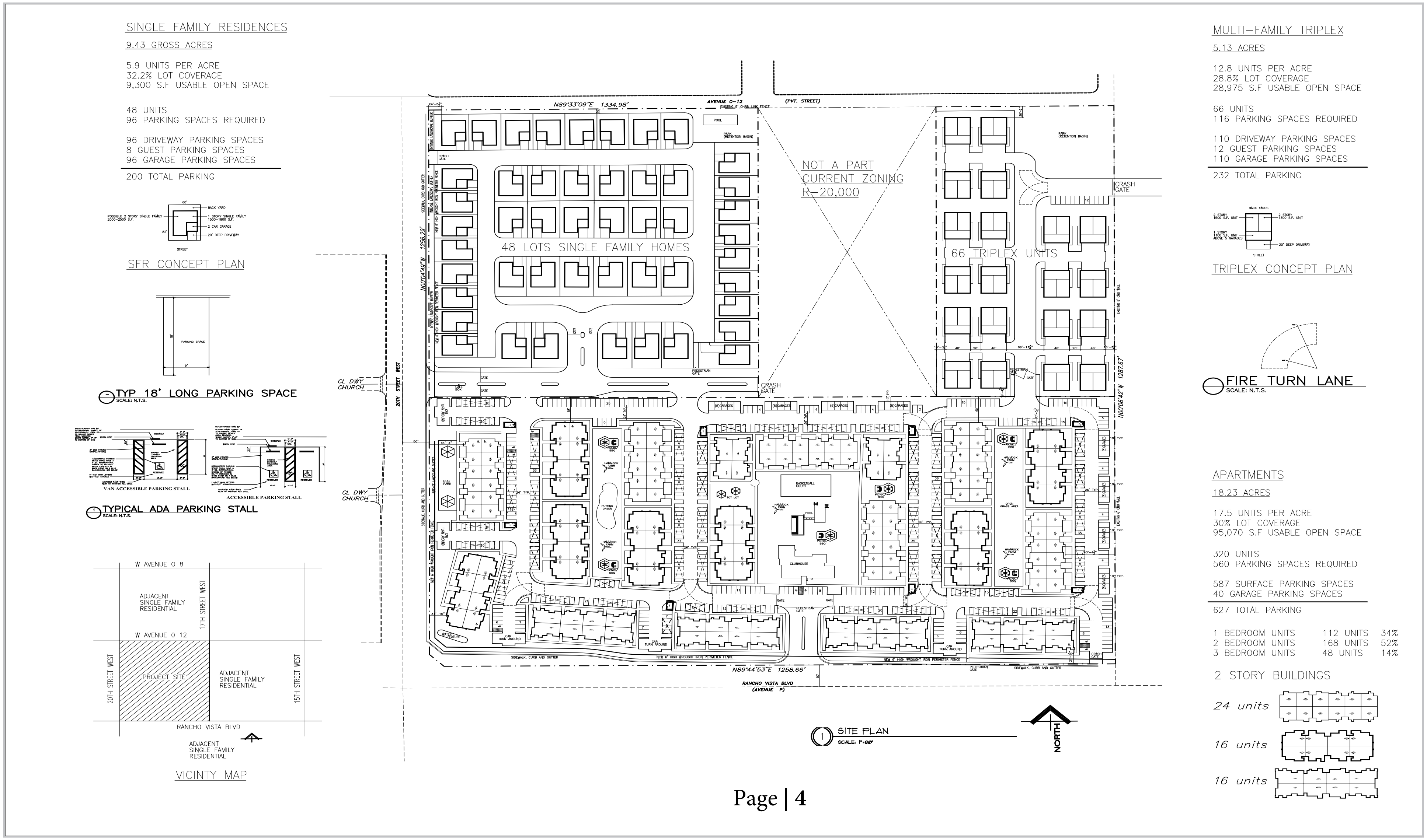
PROJECT ACCESS

The proposed project will be accessed via two driveways on 20th Street West and Rancho Vista Boulevard respectively. The 20th Street driveway will provide full access to the development where the Rancho Vista Boulevard driveway will be right-in and right-out only and controlled by the installation of a raised median. Two emergency access points that are controlled by crash gates will be provided at the northwest corner of the property on 20th Street and northeast corner connecting to Watling Drive to the east. Regional access is provided by SR-14 east of the project site. Rancho Vista Boulevard and 20th Street West are roadways that connects the project to the surrounding local roadway network and regional freeway system.

ON-SITE VEHICULAR CIRCULATION AND PARKING

The proposed on-site circulation is supported by a network of sidewalks, driveways, drive aisles and adequate vehicular stacking areas at project access points to accommodate ingress and egress to and from the proposed development for all users. Additionally, the proposed development is providing on-site parking spaces consistent with City of Palmdale parking requirement.

Figure 1-1



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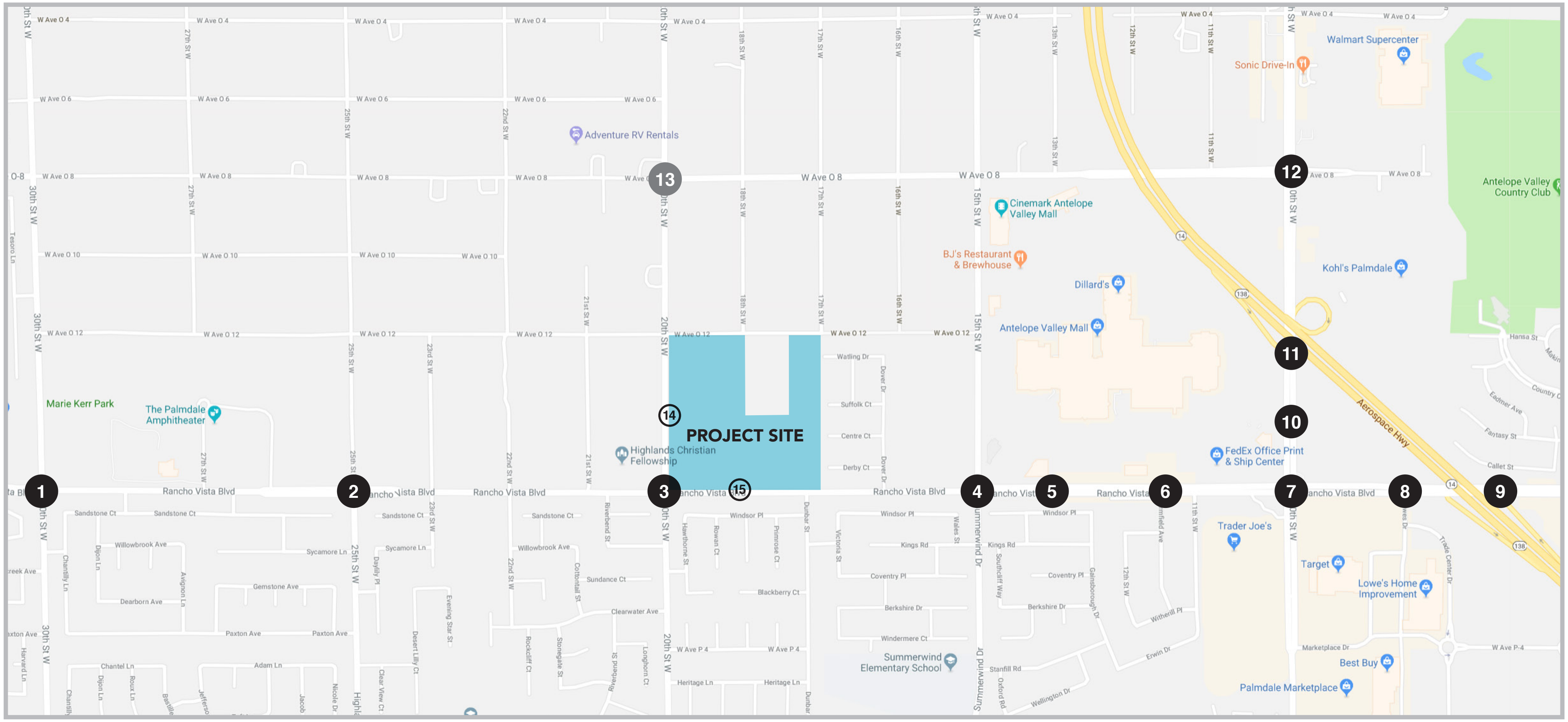
TRANSPORTATION PLANNING AND ENGINEERING

Traffic Impact Study
20TH Street West Development
Project Site Plan

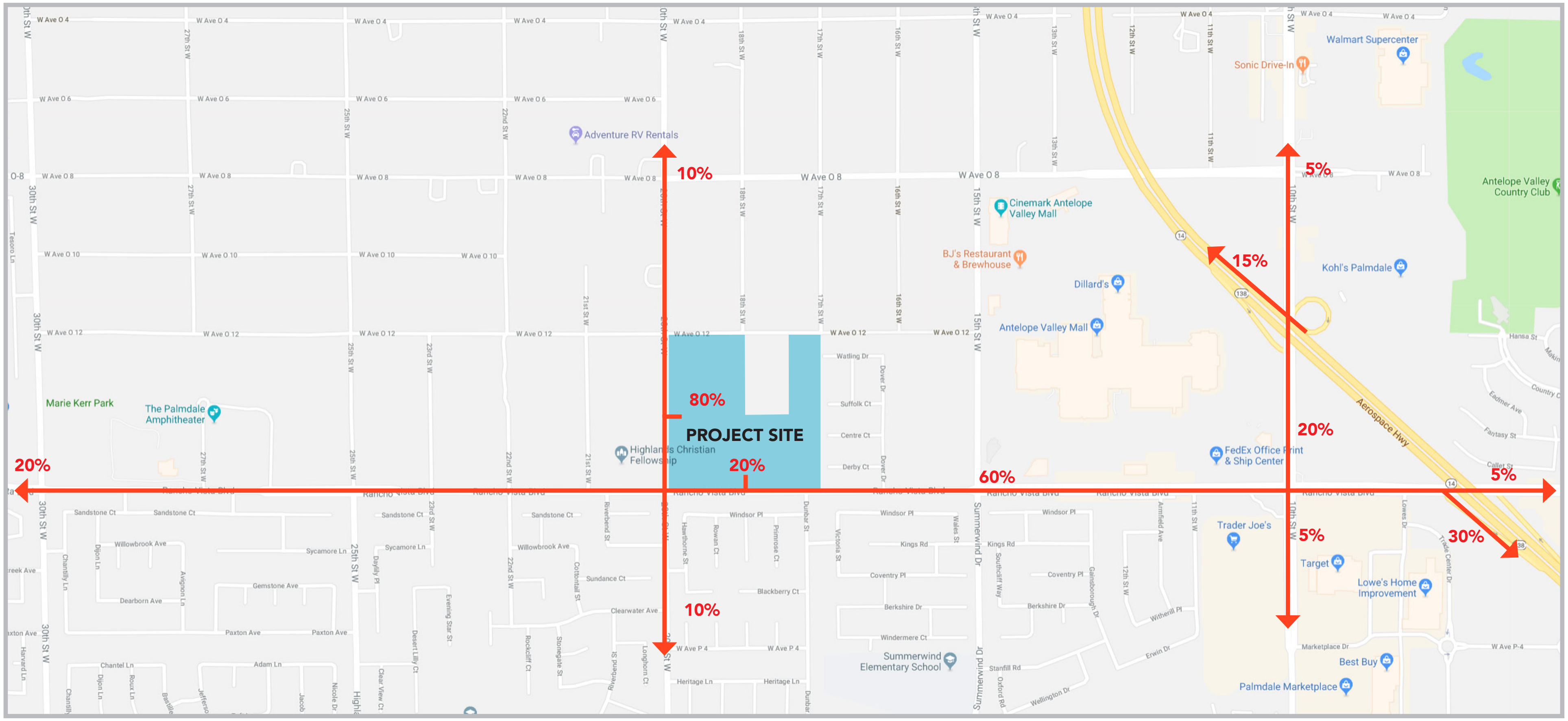
Figure 1-2



Legend

- # Signalized Intersections
- # Unsignalized Intersections
- # Driveway

Figure 1-3



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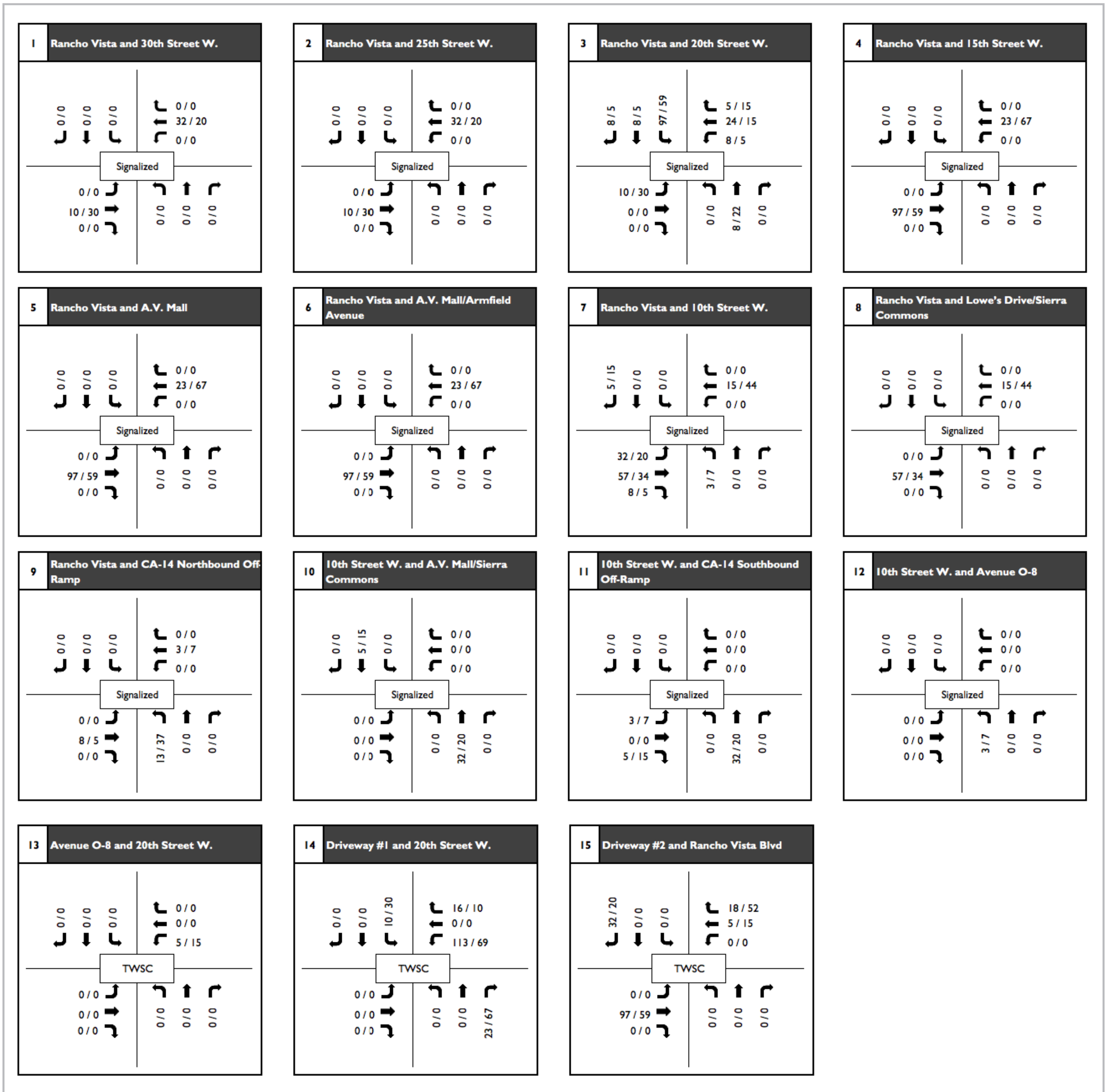
Traffic Impact Study
20TH Street West Development
Project Trip Distribution

Figure 1-4



LEGEND

0/0 = (AM/PM) Peak Hour Volumes

2.0 METHODOLOGIES

This section documents the methodologies and assumptions used to conduct the circulation impact analysis for the proposed project. This section contains the following background information:

- Study scenarios
- Study time periods
- Analysis methodologies

STUDY SCENARIOS

This report presents an analysis of the intersection operating conditions during the peak periods, which were selected in consultation with City staff for the following anticipated timeframe scenarios:

- Existing Conditions (2018)
- Existing with Project Conditions
- Opening Year plus ambient growth (2023)
- Opening Year with Project
- Buildout (2040)
- Buildout with Project

STUDY TIME PERIODS

The City selected the following peak hours for analysis:

- Weekday AM (peak hour between 7:00 AM and 9:00 AM)
- Weekday PM (peak hour between 4:00 PM and 6:00 PM)

ANALYSIS METHODOLOGIES

The street system operating conditions are typically described in terms of "level of service." Level of service is a report-card scale used to indicate the quality of traffic flow on roadway segments and at intersections. Level of service (LOS) ranges from LOS A (free flow, little congestion) to LOS F (forced flow, extreme congestion). **Table 2-1** describes generalized definitions of auto LOS A through F.

Table 2-1 Vehicular Level of Service Definitions

LOS	Characteristics
A	Primarily free-flow operation. Vehicles are completely unimpeded in their ability to maneuver within the traffic stream. Controlled delay at the boundary intersections is minimal. The travel speed exceeds 85% of the base free-flow speed.
B	Reasonably unimpeded operation. The ability to maneuver within the traffic stream is only slightly restricted and control delay at the boundary intersections is not significant. The travel speed is between 67% and 85% of the base free-flow speed.
C	Stable operation. The ability to maneuver and change lanes at mid-segment locations may be more restricted than at LOS B. Longer queues at the boundary intersections may contribute to lower travel speeds. The travel speed is between 50% and 67% of the base free-flow speed.
D	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 boundary intersections. The travel speed is between 40% and 50% of the base free-flow speed.
E	Unstable operation and significant delay. Such operations may be due to some combination of adverse signal progression, high volume, and inappropriate signal timing at the boundary intersections. The travel speed is between 30% and 40% of the base free-flow speed.
F	Flow at extremely low speed. Congestion is likely occurring at the boundary intersections, as indicated by high delay and extensive queuing. The travel speed is 30% or less of the base free-flow speed. Also, LOS F is assigned to the subject direction of travel if the through movement at one or more boundary intersections have a volume-to-capacity ratio greater than 1.0.

Source: Highway Capacity Manual, Transportation Research Board (2010)

Intersection Capacity Analysis

The analysis of peak hour intersection performance was conducted using the Synchro analysis software program, which uses methodologies defined in the 2010 Highway Capacity Manual (HCM) to calculate results. Level of service (LOS) for intersections is determined by control delay. Control delay is defined as the total elapsed time from when a vehicle stops at the end of a queue to the time the vehicle departs from the stop line. The total elapsed time includes the time required for the vehicle to travel from the last-in-queue position to the first-in-queue position, including deceleration of vehicles from free-flow speed to the speed of vehicles in the queue.

Signalized Intersections

The HCM analysis methodology for evaluating signalized intersections is based on the "operational analysis" procedure. This technique uses 1,900 passenger cars per hour of green per lane (pcphgpl) as the maximum saturation flow of a single lane at an intersection. This saturation flow rate is adjusted to account for lane width, on-street parking, conflicting pedestrian flow, traffic composition, (e.g., the percentage of vehicles that are trucks) and shared lane movements (e.g., through and right-turn movements from the same lane). Average control delay is calculated by taking a volume-weighted average of all the delays for all vehicles entering the intersection. **Table 2-2** summarizes the level of service criteria for signalized intersections.

Table 2-2 Signalized Intersection Level of Service HCM Operational Analysis Method

Average Control Delay Per Vehicle (seconds)	Level of Service (LOS) Characteristics
≤10.0	*LOS A* occurs when the volume-to-capacity ratio is low and either progression is exceptionally favorable or the cycle length is very short. If it is due to favorable progression, most vehicles arrive during the green indication and travel through the intersection without stopping.
10.1 – 20.0	*LOS B* occurs when the volume-to-capacity ratio is low and either progression is highly favorable or the cycle length is short. More vehicles stop than with LOS A.
20.1 – 35.0	*LOS C* occurs when progression is favorable or the cycle length is moderate. The number of vehicles stopping is significant, although many vehicles still pass through the intersection without stopping.
35.1 – 55.0	*LOS D* occurs when the volume-to-capacity ratio is high and either progression is ineffective or the cycle length is long. Many vehicles stop and individual cycle failures are noticeable.
55.1 – 80.0	*LOS E* occurs when the volume-to-capacity ratio is high, progression is unfavorable, and the cycle length is long. Individual cycle failures are frequent.
>80.0	*LOS F* occurs when the volume-to-capacity ratio is very high, progression is very poor, and the cycle length is long. Most cycles fail to clear the queue.

Source: Highway Capacity Manual, Transportation Research Board (2010)

All-way Stop-controlled (AWSC) Intersections

The HCM analysis methodology for evaluating all-way Stop-controlled intersections is based on the degree of conflict for each independent approach created by the opposing approach and each conflicting approach. Level of Service for AWSC intersections is also based on the average control delay. However, AWSC intersections have different threshold values than those applied to signalized intersections. This is based on the rationale that drivers expect AWSC intersections to carry lower traffic volumes than at signalized intersections. Therefore, a higher level of delay is acceptable at a signalized intersection for the same LOS.

Two-way Stop-controlled (TWSC) Intersections

The HCM analysis methodology for evaluating two-way Stop-controlled (TWSC) intersections is based on gap acceptance and conflicting traffic for vehicles stopped on the minor-street approaches. The critical gap (or minimum gap that would be acceptable) is defined as the minimum time interval in the major-street traffic stream that allows intersection entry for one minor-street vehicle. Average control delay and LOS for the "worst approach" are reported. Level of service is not defined for the intersection as a whole.

Table 2-3 summarizes the level of service criteria for unsignalized intersections.

Table 2-3 Level of Service Criteria for Stop Controlled Unsignalized Intersections

Average Control Delay (sec/veh)	Level of Service (LOS)
≤10.0	A
10.1 – 15.0	B
15.1 – 25.0	C
25.1 – 35.0	D
35.1 – 50.0	E
>50.0	F

Source: Highway Capacity Manual, Transportation Research Board (2010)

Analysis of Significance
Traffic impacts are identified if the proposed project will result in a significant change in traffic conditions on a roadway or intersection. A significant impact is normally defined when project related traffic would cause level of service to deteriorate to below the minimum acceptable level by a measurable amount. Impacts may also be significant if the location is already below the minimum acceptable level and project related traffic causes a further decline.

Level of Service D is frequently identified as the minimum allowable "Standard" service level during peak hours at signalized intersections. Most arriving traffic will clear the intersection on the first allowable green cycle under this level of service. Mitigation measures shall be considered by development projects within the City of Palmdale when traffic conditions are forecasted to decline form an LOS D to poorer levels of service.

3.0 EXISTING CONDITIONS (2018)

This section documents the circulation system conditions within the study area of the project under the Exiting without and with project scenarios. The Existing Conditions (2018) without project traffic volumes are developed using existing volumes counts. Project traffic volumes are then added to Existing (2018) traffic volumes to develop the Existing with project traffic volumes. This section also documents potential direct project impacts on the existing local and regional circulation networks.

EXISTING TRANSIT AND ACTIVE TRANSPORTATION ASYSTEMS

The Antelope Valley Transit Authority (AVTA) is the main transit agency servicing the City of Palmdale. AVTA provides both local and regional services throughout the region with fixed-routes, Commuter routes, and Dial-A-Ride services. AVTA bus routes 1, 2, 3 7 and 9 service the City of Palmdale. Active transportation facilities including pedestrian and bicycle facilities are provided within the study area of the proposed project.

TRAFFIC VOLUMES

The intersection turning movement counts were conducted during the weekday morning peak period from 7:00 AM to 9:00 AM and during the weekday evening peak period from 4:00 PM to 6:00 PM on January 2018. Figure 3-1 shows the existing geometric configuration of the intersections. The Existing and Existing with Project weekday morning and evening peak hour intersection volumes are shown in Figures 3-2 and 3-3. Traffic count data is provided in **Appendix A**

EXISTING ANALYSIS (2018)

Table 3-1 shows Existing Conditions (2018) intersection analysis results.

Figures 3-1 through 3-3 show Existing Conditions (2018) peak hour intersection turning movement volumes.

Table 3-1
Existing (2018) Intersection Conditions

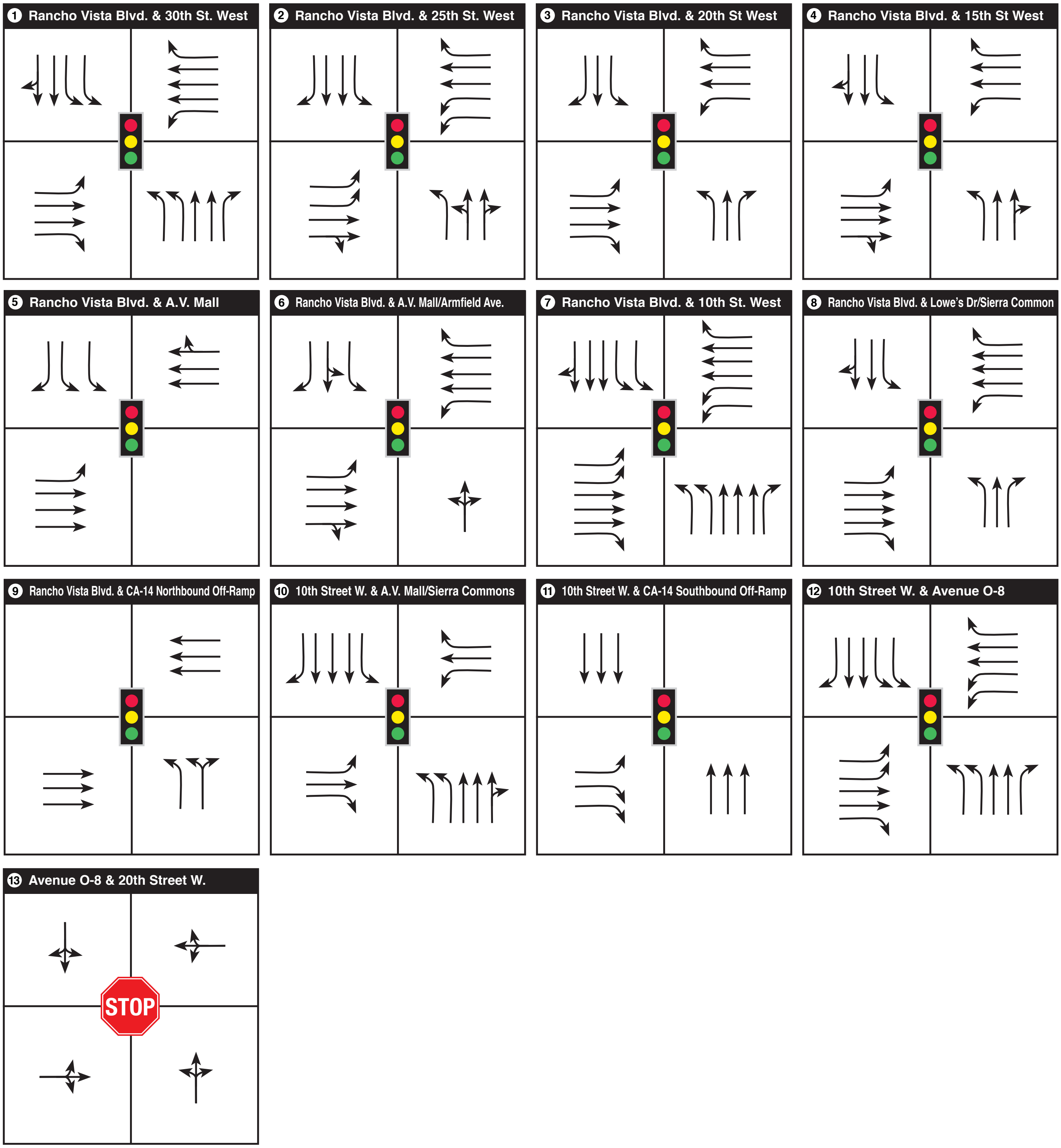
Intersection	Existing Without Project		Existing With Project	
	Delay(a) (sec)	LOS(b)	Delay (sec)	LOS
AM/PM Peak Hour				
1- Rancho Vista Blvd. & 30th Street W.	17.2/16.5	B/B	17.2/16.5	B/B
2- Rancho Vista Blvd. & 25th Street W.	21.2/11.1	C/B	21.2/11.2	C/B
3- Rancho Vista Blvd. & 20th Street W.	12.0/10.5	B/B	15.3/13.3	B/B
4- Rancho Vista Blvd. & 15th Street W.	15.4/11.2	B/B	15.8/11.2	B/B
5- Rancho Vista Blvd. & A.V. Mall	2.7/4.7	A/A	2.7/4.7	A/A
6- Rancho Vista Blvd. & A.V. Mall/Armfield Avenue	8.1/ 12.3	A/B	8.3/ 12.5	A/B
7- Rancho Vista Blvd. & 10th Street W.	20.3/31.3	C/C	20.8/32.3	C/C
8- Rancho Vista Blvd. & Lowe's Drive/Sierra Commons	8.5/14.9	A/B	8.5/15.1	A/B
9- Rancho Vista Blvd. & CA-14 Northbound Off-Ramp	7.4/10.4	A/B	7.5/10.7	A/B
10- 10th Street W. & A.V. Mall/Sierra Commons	9.5/20.1	A/C	9.5/20.2	A/C
11- 10th Street W. & CA-14 Southbound Off-Ramp	5.4/15.1	A/B	5.5/15.4	A/B
12- 10th Street W. & Avenue O-8	13.5/15.9	B/B	13.5/16.0	B/B
13- Avenue O-8 & 20th Street W.	12.1/16.1	B/C	12.2/16.1	B/C
14- 20th St. & Driveway #1	N/A	N/A	15.8/13.5	C/B
15- Rancho Vista Blvd & Driveway #2	N/A	N/A	10.8/16.8	B/C

Notes:
Bold *values indicate intersections operating at LOS E or F*
(a) Delay refers to the average control delay for the entire intersection, measured in seconds per vehicle. At unsignalized intersection, delay refers to the worst movement.
(b) LOS calculations are based on the methodology outlined in the 2010 Highway Capacity Manual and performed using Synchro 10

ANALYSIS RESULTS

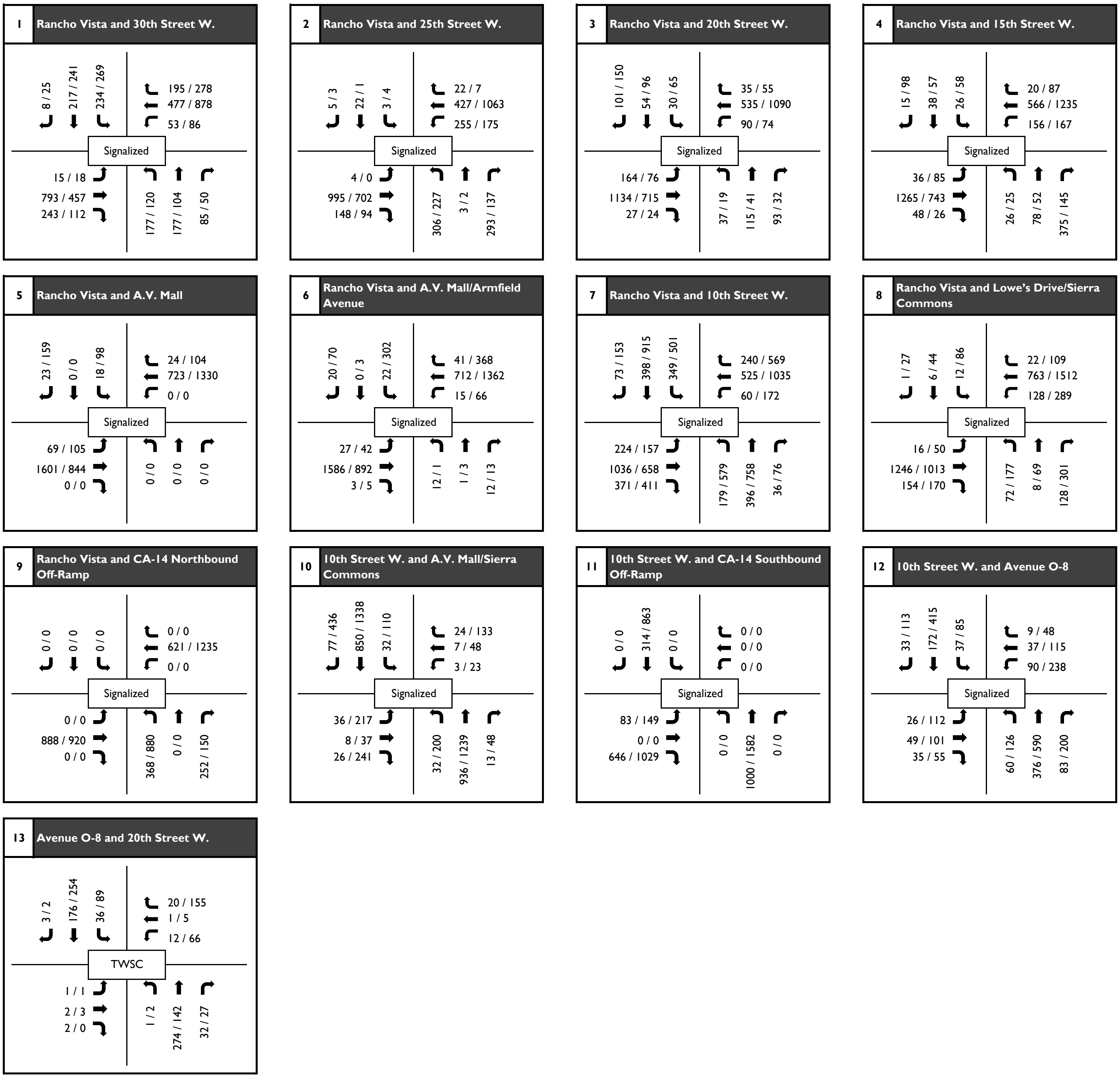
Per the analysis results shown in the above table, all intersections analyzed under Existing Conditions (2018) are determined to be operating at an acceptable level of service. Existing and Existing with Project Synchro analysis sheets are provided in **Appendices B and C** respectively.

Figure 3-1



1 Rancho Vista Blvd. & 30th St. West
2 Rancho Vista Blvd. & 25th St. West
3 Rancho Vista Blvd. & 20th St West
4 Rancho Vista Blvd. & 15th St West
5 Rancho Vista Blvd. & A.V. Mall
6 Rancho Vista Blvd. & A.V. Mall/Armfield Ave.
7 Rancho Vista Blvd. & 10th St. West
8 Rancho Vista Blvd. & Lowe's Dr/Sierra Common
9 Rancho Vista Blvd. & CA-14 Northbound Off-Ramp
10 10th Street W. & A.V. Mall/Sierra Commons
11 10th Street W. & CA-14 Southbound Off-Ramp
12 10th Street W. & Avenue O-8
13 Avenue O-8 & 20th Street W.
STOP

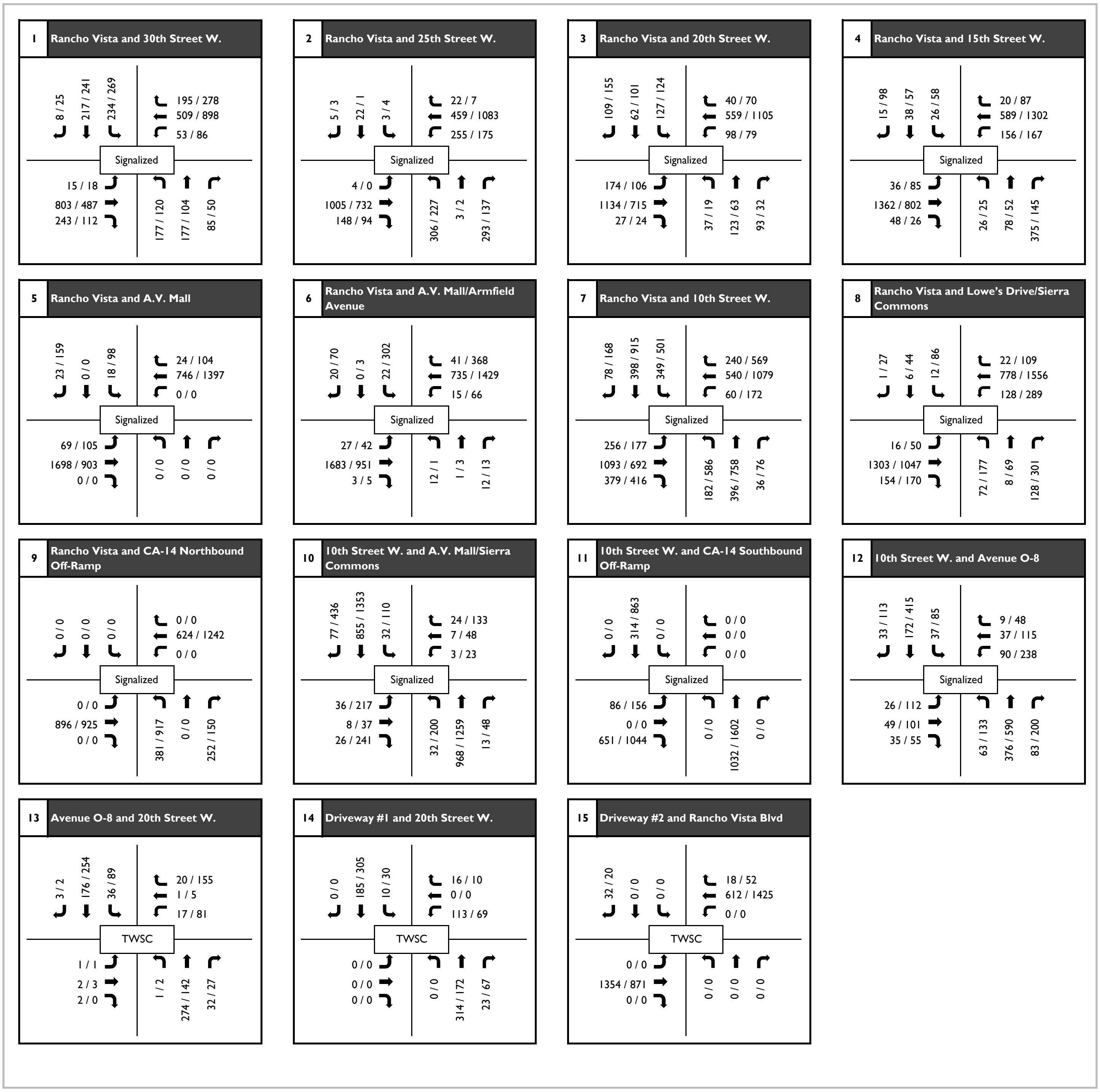
Figure 3-2



LEGEND

0/0 = (AM/PM) Peak Hour Volumes

Figure 3-3



LEGEND
0/0 = (AM/PM) Peak Hour Volumes

4.0 OPENING YEAR CONDITIONS (2023)

This section documents the circulation system conditions within the study area of the project under Opening Year (2023) without and with project scenarios. The Opening Year Conditions (2023) without project traffic volumes were developed by adding a compounded two percent per year growth over a five year period to the existing traffic volumes. Project traffic volumes are then added to the Opening Year Conditions (2023) without project traffic volumes to develop Opening Year Conditions (2023) With Project traffic volumes. This section also documents potential cumulative project impacts on the existing circulation networks.

OPENING YEAR ANALYSIS (2023)

Tables 4-1 shows Opening Year Conditions (2023) intersections, freeway mainline, and freeway ramp merge/diverge analysis results.

Figures 4-1 through 4-2 show Opening Year Conditions (2023) without and with project peak hour intersection turning movement volumes.

Table 4-1
Opening Year (2023) Intersection Conditions

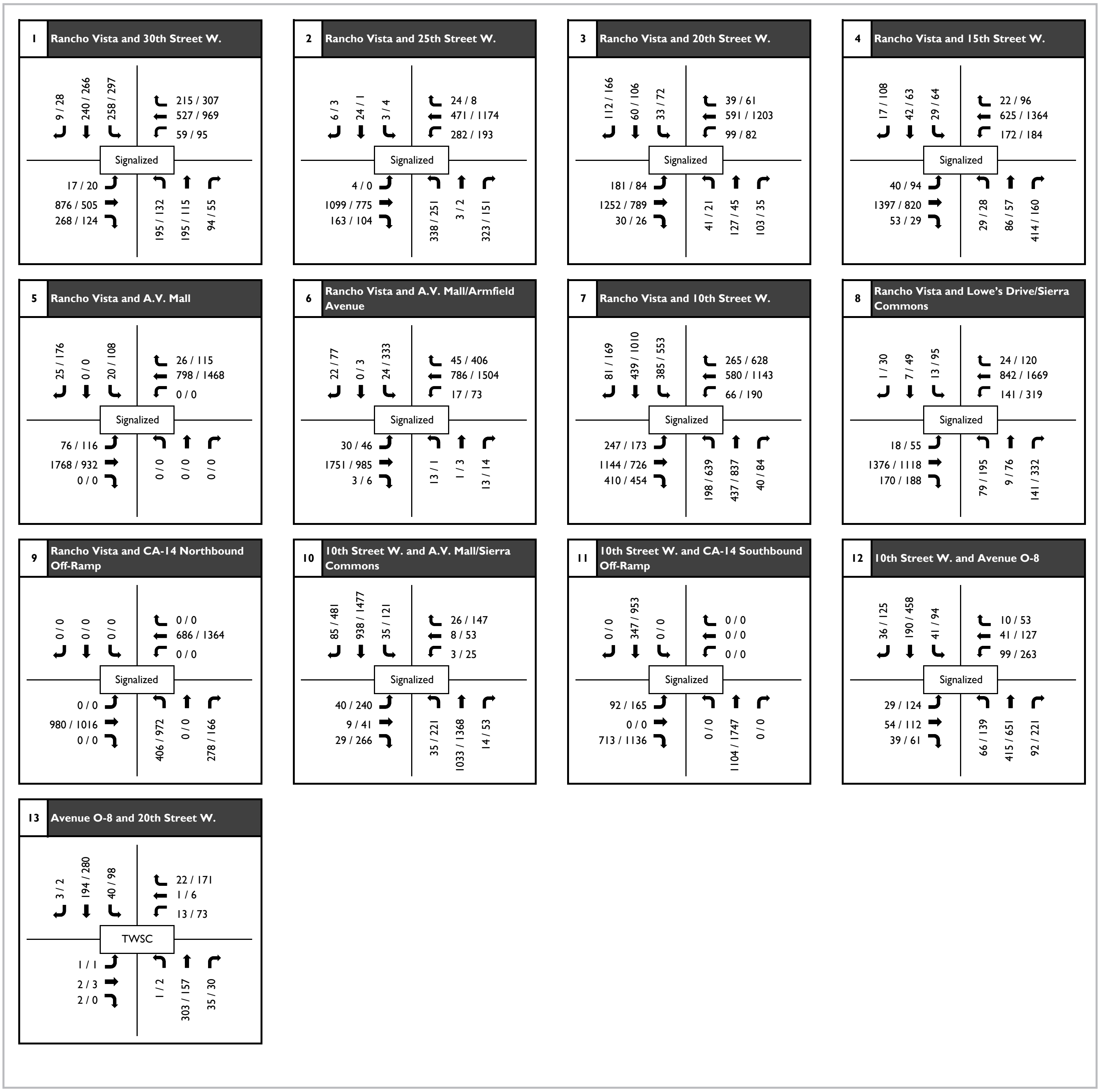
Intersection	Year 2023 Without Project		Year 2023 With Project	
	Delay (sec)	LOS	Delay (sec)	LOS
AM/PM Peak Hour				
1- Rancho Vista Blvd. & 30th Street W.	17.7/17.8	B/B	17.7/17.9	B/B
2- Rancho Vista Blvd. & 25th Street W.	22.4/11.8	C/B	22.4/11.9	C/B
3- Rancho Vista Blvd. & 20th Street W.	13.4/11.8	B/B	18.1/14.6	B/B
4- Rancho Vista Blvd. & 15th Street W.	16.2/12.4	B/B	17.1/12.6	B/B
5- Rancho Vista Blvd. & A.V. Mall	2.7/5.4	A/A	2.7/5.7	A/A
6- Rancho Vista Blvd. & A.V. Mall/Armfield Avenue	8.4/ 12.9	A/B	8.6/ 13.1	A/B
7- Rancho Vista Blvd. & 10th Street W.	20.9/40.2	C/D	21.5/43.0	C/D
8- Rancho Vista Blvd. & Lowe's Drive/Sierra Commons	8.8/16.9	A/B	8.9/17.2	A/B
9- Rancho Vista Blvd. & CA-14 Northbound Off-Ramp	8.1/12.6	A/B	8.2/13.1	A/B
10- 10th Street W. & A.V. Mall/Sierra Commons	9.7/22.5	A/C	9.7/22.7	A/C
11- 10th Street W. & CA-14 Southbound Off-Ramp	6.2/22.0	A/C	6.3/22.9	A/C
12- 10th Street W. & Avenue O-8	13.7/16.7	B/B	13.7/16.8	B/B
13- Avenue O-8 & 20th Street W.	12.7/17.5	B/C	12.9/18.4	B/C
14- 20th St. & Driveway #1	N/A	N/A	17.1/13.6	C/B
15- Rancho Vista Blvd & Driveway #2	N/A	N/A	11.1/17.4	B/C

Notes:
***Bold** values indicate intersections operating at LOS E or F*
(c) Delay refers to the average control delay for the entire intersection, measured in seconds per vehicle. At unsignalized intersection, delay refers to the worst movement.
(d) LOS calculations are based on the methodology outlined in the 2010 Highway Capacity Manual and performed using Synchro 10

ANALYSIS RESULTS

Per the analysis results shown in the above table, all intersections analyzed under Opening Year Conditions (2023) are determined to be operating at an acceptable level of service. Opening Year (2023) and Opening Year (2023) With Project Synchro analysis sheets are provided in **Appendices D and E** respectively.

Figure 4-1



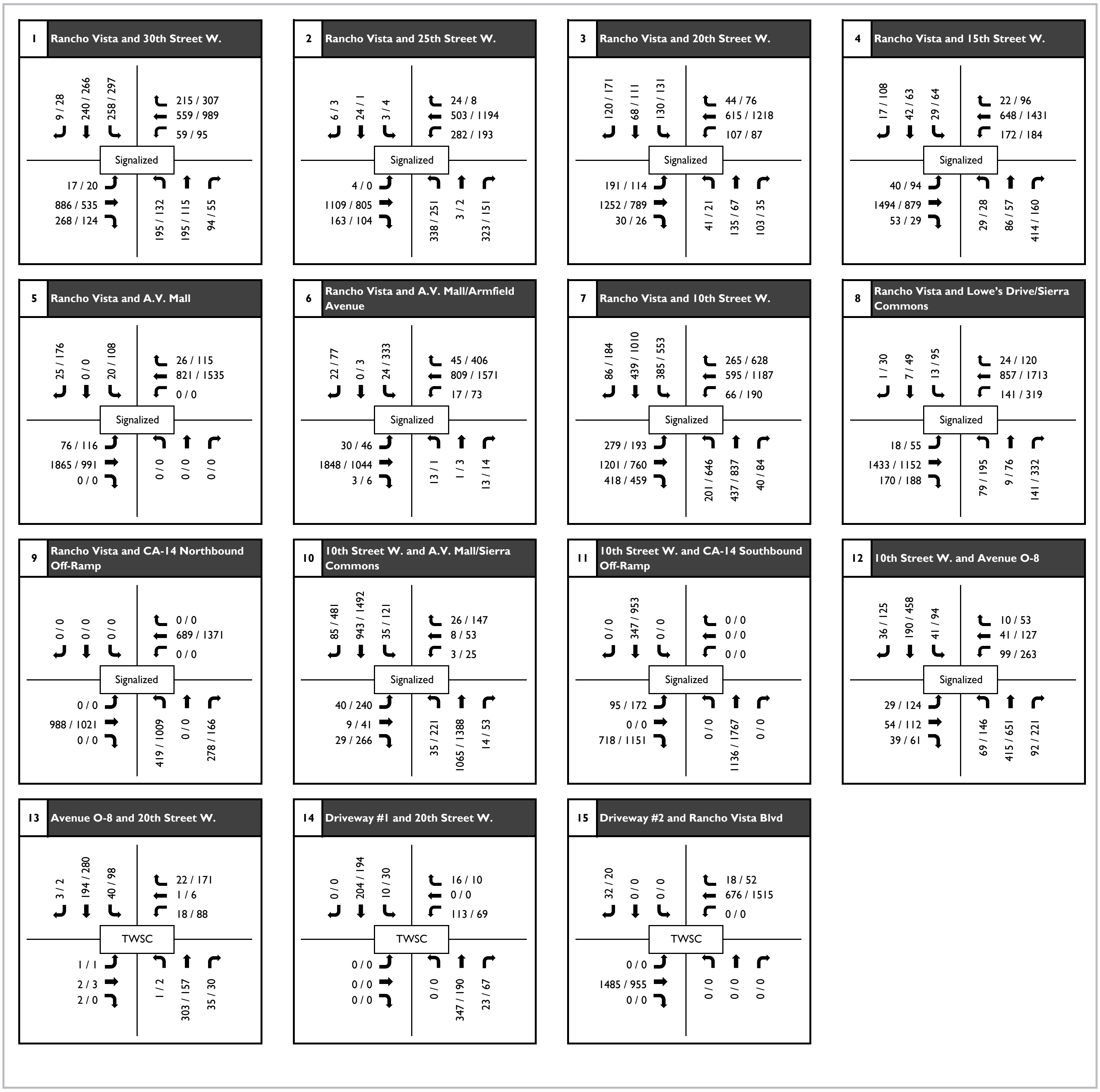
LEGEND

0/0 = (AM/PM) Peak Hour Volumes

INTEGRATED ENGINEERING GROUP
TRANSPORTATION PLANNING AND ENGINEERING

Traffic Impact Study
20TH Street West Development
Opening Year (2023) AM/PM Peak Hour Volumes

Figure 4-2



LEGEND

0/0 = (AM/PM) Peak Hour Volumes

5.0 BUILDOUT YEAR CONDITIONS (2040)

This section documents the circulation system conditions within the study area of the project under Buildout Year (2040) without and with project scenarios. The Buildout Year Conditions (2023) without project traffic volumes were developed by adding a compounded two percent per year growth over a twenty two year period to the existing traffic volumes. Project traffic volumes are then added to the Buildout Year Conditions (2023) without project traffic volumes to develop Buildout Year Conditions (2040) With Project traffic volumes. This section also documents potential cumulative project impacts on the existing circulation networks.

BUILDOUT YEAR (2040) ANALYSIS NETWORK ASSUMPTIONS

All assumptions considered under Buildout Condition scenarios were vetted, reviewed and approved by City of Palmdale staff. The Buildout network assumes no changes from the network assumed under the Existing and Opening Year Conditions.

BUILDOUT YEAR ANALYSIS (2040)

Tables 5-1 shows Buildout Conditions (2040) intersections analysis results.

Figures 5-1 through 5-2 show Buildout Conditions (2040) without and with project peak hour intersection turning movement volumes.

Table 5-1
Buildout Year (2040) Intersection Conditions

Intersection	Year 2040 Without Project		Year 2040 With Project	
	Delay (a) (sec)	LOS(b)	Delay (sec)	LOS
AM/PM Peak Hour				
1- Rancho Vista Blvd. & 30th Street W.	25.6/21.7	C/C	25.7/21.8	C/C
2- Rancho Vista Blvd. & 25th Street W.	51.6/16.1	D/B	52.0/16.9	D/B
3- Rancho Vista Blvd. & 20th Street W.	24.9/18.2	C/B	34.1/26.2	C/C
4- Rancho Vista Blvd. & 15th Street W.	39.9/23.5	D/C	45.1/27.8	D/C
5- Rancho Vista Blvd. & A.V. Mall	2.9/11.4	A/B	3.2/11.9	A/B
6- Rancho Vista Blvd. & A.V. Mall/Armfield Avenue	8.5/ 18.2	A/B	9.6/18.8	A/B
7- Rancho Vista Blvd. & 10th Street W.	31.6/102.0	C/**F**	32.6/105.7	C/**F**
8- Rancho Vista Blvd. & Lowe's Drive/Sierra Commons	12.6/35.9	B/D	13.1/36.1	B/D
9- Rancho Vista Blvd. & CA-14 Northbound Off-Ramp	12.3/34.2	B/C	12.3/36.5	B/D
10- 10th Street W. & A.V. Mall/Sierra Commons	10.3/43.2	B/D	10.3/44.7	B/D
11- 10th Street W. & CA-14 Southbound Off-Ramp	11.6/93.2	B/**F**	12.2/96.5	B/**F**
12- 10th Street W. & Avenue O-8	14.6/20.0	B/C	14.7/20.0	B/B
13- Avenue O-8 & 20th Street W.	13.4/24.8	B/C	13.4/26.0	B/D
14- 20th St. & Driveway #1	N/A	N/A	26.2/22.6	D/C
15- Rancho Vista Blvd & Driveway #2	N/A	N/A	13.4/22.9	B/C

Notes:
***Bold** values indicate intersections operating at LOS E or F*
(e) Delay refers to the average control delay for the entire intersection, measured in seconds per vehicle. At unsignalized intersection, delay refers to the worst movement.
(f) LOS calculations are based on the methodology outlined in the 2010 Highway Capacity Manual and performed using Synchro 10

ANALYSIS RESULTS

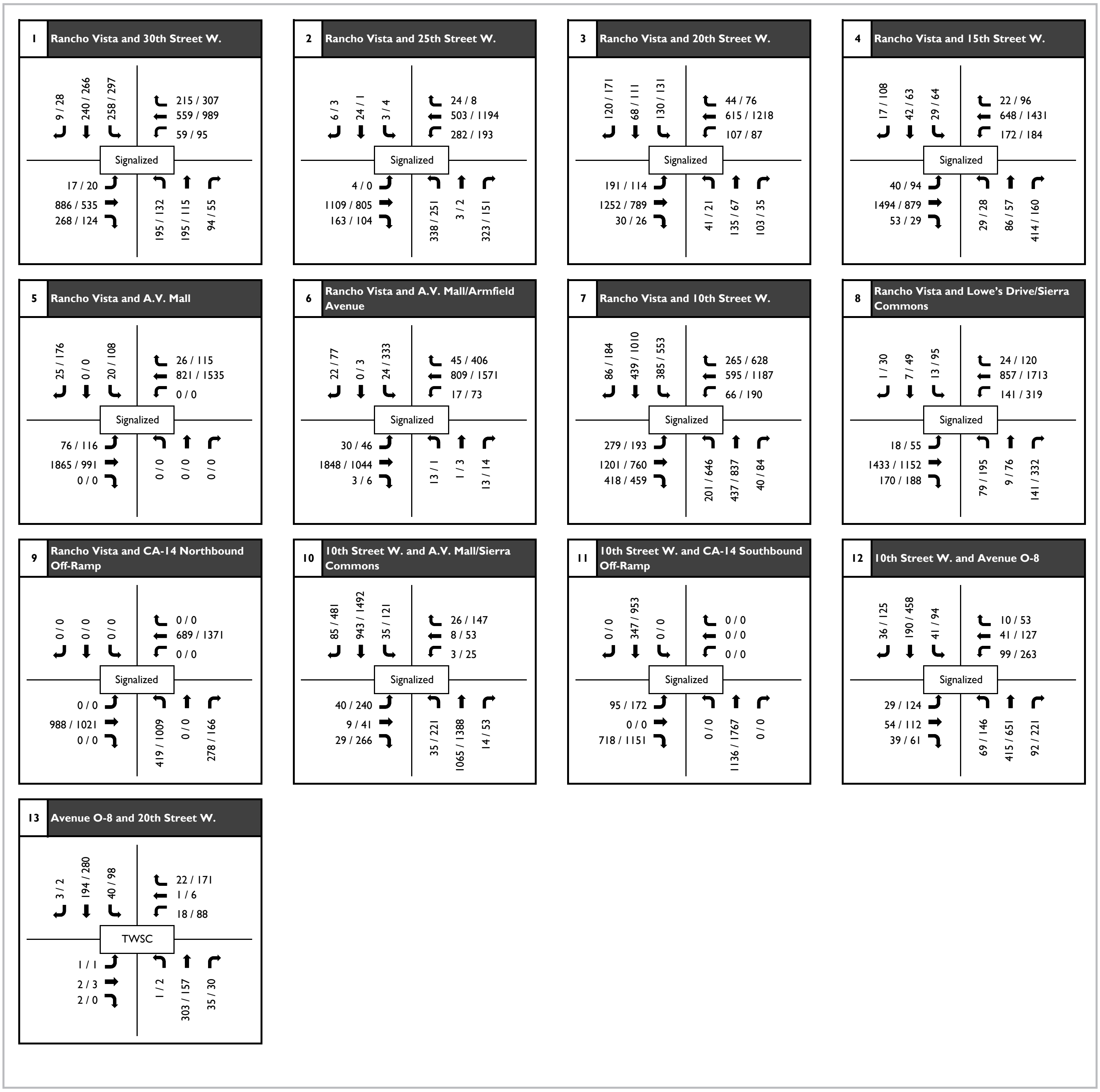
Per the analysis results shown in the above table, all intersections analyzed under Buildout Conditions (2040) are determined to be operating at an acceptable level of service except for the following locations:

- Rancho Vista and 10th Street W. (Intersection 7)
- 10th Street W. and CA-14 Southbound Off-Ramp (Intersection 11)

The two locations identified above are determined to be significantly impacted with the implementation of the proposed project.

Buildout Year (2040) without and with project Synchro analysis sheets are provided in **Appendices F and G** respectively.

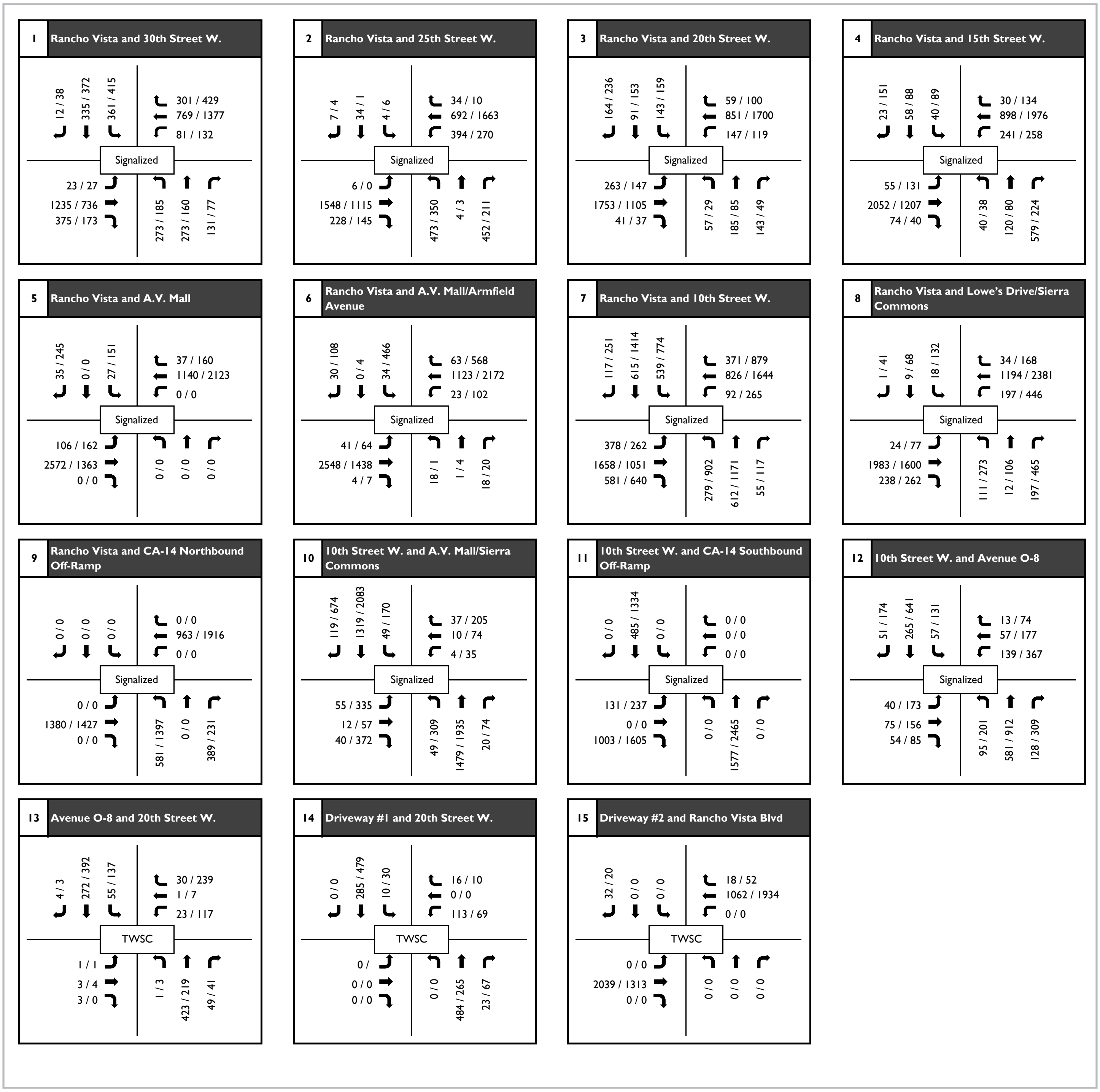
Figure 5-1



LEGEND

0/0 = (AM/PM) Peak Hour Volumes

Figure 5-2



LEGEND

0/0 = (AM/PM) Peak Hour Volumes

6.0 BUILDOUT YEAR (2040) POST-MITIGATION ANALYSIS

This section provides post mitigation analysis results after the implementation of the recommended mitigation measures at the two impacted locations under Buildout (2040) With Project scenario.

Tables 6-1 displays the analysis results after the implementation of the recommended mitigation measures described in section of the report.

Table 6-1
Buildout Year (2040) Post Mitigation Intersection Conditions

Intersection	Buildout Without Project		Buildout With Project		Buildout Post Mitigation		Recommended Improvement
	Delay(a)	LOS(b)	Delay(a)	LOS(b)	Delay(a)	LOS(b)	
AM/PM Peak Hour							
7- Rancho Vista & 10th Street W.	31.6/102.0	C/**F**	32.6/105.7	C/**F**	30.5/75.6	C/**E**	Refer to Figure 6-1
11- 10th Street W. & CA-14 Southbound Off-Ramp	11.6/93.2	B/**F**	12.2/96.5	B/**F**	11.6/33.8	B/C	Refer to Figure 6-1

Notes:
Bold *values indicate intersections operating at LOS E or F*
(g) Delay refers to the average control delay for the entire intersection, measured in seconds per vehicle. At unsignalized intersection, delay refers to the worst movement.
(h) LOS calculations are based on the methodology outlined in the 2010 Highway Capacity Manual and performed using Synchro 10

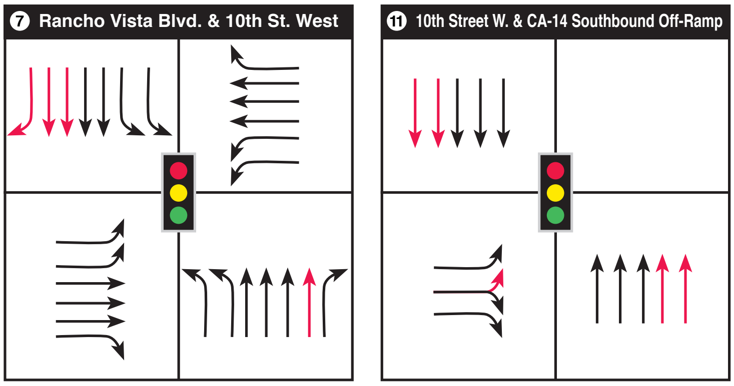
ANALYSIS RESULTS

Per the analysis results shown in the above table, project related impacts at Rancho Vista and 10th Street W., and 10th Street W. and CA-14 Southbound Off-Ramp intersections will be fully mitigated with the implementation of the proposed mitigation measures. Delays and LOS will be improved at both intersections to operation levels equal or better than the ones under Buildout Without Project conditions.

Figure 6-1 shows the recommended intersection improvements at Rancho Vista/10th Street West, and 10th Street West/CA-14 Southbound Off-Ramp intersections. These improvements are part of the proposed 10th Street West widening project that is funded METRO Measure R funds.

Buildout Year (2040) post mitigation Synchro analysis sheets are provided in **Appendix H**.

Figure 6-1



LEGEND

Proposed Improvement

APPENDIX A
TRAFFIC COUNT DATA

T816

INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 cs@aimtd.com

DATE:	LOCATION:	Palmdale	PROJECT #:	SC1565
Wed, Jan 24, 18	NORTH & SOUTH:	30th	LOCATION #:	1
	EAST & WEST:	Rancho Vista	CONTROL:	SIGNAL

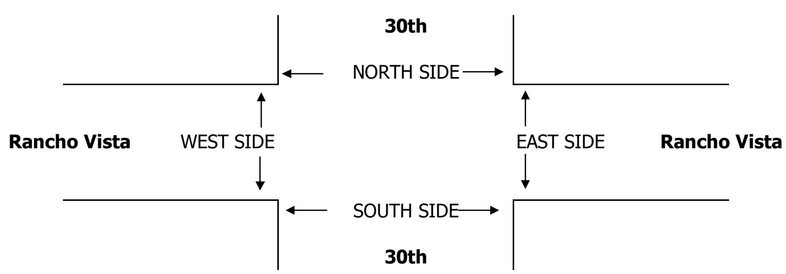
NOTES:

AM PM MD OTHER OTHER

N ◄ W E ► S

Add U-Turns to Left Turns

	NORTHBOUND 30th			SOUTHBOUND 30th			EASTBOUND Rancho Vista			WESTBOUND Rancho Vista				U-TURNS				
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL	NB	SB	EB	WB	TTL
LANES:	2	2	1	2	2	0	1	2	1	1	3	1		0	0	0	0	
AM 7:00 AM	28	42	17	44	64	2	2	114	39	9	88	46	495	0	0	0	0	0
7:15 AM	65	67	17	51	77	1	3	141	76	24	181	68	771	0	0	0	0	0
7:30 AM	58	37	21	62	30	3	6	260	67	8	137	46	735	0	0	0	0	0
7:45 AM	26	31	30	77	46	2	4	278	61	12	71	35	673	0	0	0	0	0
8:00 AM	12	24	21	45	35	4	2	130	21	5	77	22	398	0	0	0	0	0
8:15 AM	12	19	10	43	11	5	1	103	20	4	66	20	314	0	0	0	0	0
8:30 AM	7	15	18	32	18	2	2	106	6	6	77	23	312	0	0	1	0	1
8:45 AM	14	25	30	36	29	1	6	127	16	10	66	28	388	0	0	1	0	1
VOLUMES	222	260	164	390	310	20	26	1,259	306	78	763	288	4,086	0	0	2	0	2
APPROACH %	34%	40%	25%	54%	43%	3%	2%	79%	19%	7%	68%	26%						
APP/DEPART	646	/	572	720	/	694	1,591	/	1,813	1,129	/	1,007	0					
BEGIN PEAK HR		7:00 AM																
VOLUMES	177	177	85	234	217	8	15	793	243	53	477	195	2,674					
APPROACH %	40%	40%	19%	51%	47%	2%	1%	75%	23%	7%	66%	27%						
PEAK HR FACTOR		0.737			0.890			0.766			0.664		0.867					
APP/DEPART	439	/	387	459	/	513	1,051	/	1,112	725	/	662	0					
PM 4:00 PM	22	22	9	77	41	5	6	86	26	12	188	66	560	0	0	0	0	0
4:15 PM	19	18	10	48	41	10	2	125	20	21	191	71	576	0	1	0	0	1
4:30 PM	31	32	13	59	53	4	6	114	30	17	213	67	639	0	0	0	0	0
4:45 PM	31	33	15	71	72	4	5	118	32	20	190	78	669	0	0	1	0	1
5:00 PM	24	15	12	79	52	4	2	104	29	24	201	60	606	0	0	0	0	0
5:15 PM	32	25	8	49	71	13	5	117	20	25	253	72	690	0	0	1	0	1
5:30 PM	33	31	15	70	46	4	6	118	31	17	234	68	673	0	0	0	0	0
5:45 PM	26	22	29	59	63	6	5	130	21	26	193	62	642	0	0	0	0	0
VOLUMES	218	198	111	512	439	50	37	912	209	162	1,663	544	5,055	0	1	2	0	3
APPROACH %	41%	38%	21%	51%	44%	5%	3%	79%	18%	7%	70%	23%						
APP/DEPART	527	/	778	1,001	/	810	1,158	/	1,534	2,369	/	1,933	0					
BEGIN PEAK HR		4:45 PM																
VOLUMES	120	104	50	269	241	25	18	457	112	86	878	278	2,638					
APPROACH %	44%	38%	18%	50%	45%	5%	3%	78%	19%	7%	71%	22%						
PEAK HR FACTOR		0.867			0.910			0.947			0.887		0.956					
APP/DEPART	274	/	398	535	/	439	587	/	776	1,242	/	1,025	0					



	PEDESTRIAN + BIKE CROSSINGS					PEDESTRIAN CROSSINGS					BICYCLE CROSSINGS				
	N SIDE	S SIDE	E SIDE	W SIDE	TOTAL	N SIDE	S SIDE	E SIDE	W SIDE	TOTAL	NS	SS	ES	WS	TOTAL
AM 7:00 AM	0	0	0	4	4	0	0	0	2	2	0	0	0	2	2
7:15 AM	0	0	0	1	1	0	0	0	0	0	0	0	0	1	1
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	1	0	0	2	3	0	0	0	2	2	1	0	0	0	1
8:00 AM	1	0	0	3	4	1	0	0	3	4	0	0	0	0	0
8:15 AM	1	1	2	1	5	1	1	2	1	5	0	0	0	0	0
8:30 AM	1	0	3	0	4	0	0	2	0	2	1	0	1	0	2
8:45 AM	1	0	0	2	3	0	0	0	0	0	1	0	0	2	3
TOTAL	5	1	5	13	24	2	1	4	8	15	3	0	1	5	9
PM 4:00 PM	2	0	8	3	13	0	0	8	3	11	2	0	0	0	2
4:15 PM	6	2	0	5	13	6	2	0	5	13	0	0	0	0	0
4:30 PM	2	0	4	2	8	0	0	4	1	5	2	0	0	1	3
4:45 PM	6	0	0	5	11	4	0	0	5	9	2	0	0	0	2
5:00 PM	4	1	1	0	6	4	1	1	0	6	0	0	0	0	0
5:15 PM	3	2	6	8	19	3	1	6	7	17	0	1	0	1	2
5:30 PM	1	1	1	3	6	1	1	1	3	6	0	0	0	0	0
5:45 PM	2	0	1	1	4	2	0	1	0	3	0	0	0	1	1
TOTAL	26	6	21	27	80	20	5	21	24	70	6	1	0	3	10

INTERSECTION TURNING MOVEMENT COUNTS

T816

PREPARED BY: AimTD LLC. tel: 714 253 7888 cs@aimtd.com

DATE:	LOCATION:	Palmdale	PROJECT #:	SC1565
Wed, Jan 24, 18	NORTH & SOUTH:	25th	LOCATION #:	2
	EAST & WEST:	Rancho Vista	CONTROL:	SIGNAL

NOTES:

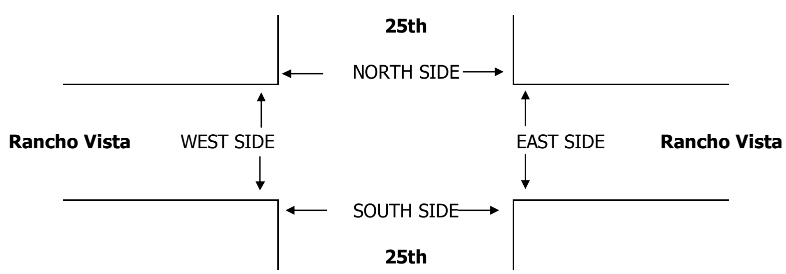
AM PM MD OTHER OTHER

▲ N ◄ W E ► S ▼

Add U-Turns to Left Turns

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	25th			25th			Rancho Vista			Rancho Vista			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1.5	1	0.5	1	2	1	2	2	0	2	2	1	
AM 7:00 AM	66	0	84	0	4	2	0	153	25	82	105	7	528
7:15 AM	128	2	91	0	12	0	0	178	39	123	128	10	711
7:30 AM	83	0	80	2	4	0	2	312	39	26	108	2	658
7:45 AM	29	1	38	1	2	3	2	352	45	24	86	3	586
8:00 AM	15	0	29	0	2	1	0	179	16	23	80	1	346
8:15 AM	26	0	35	0	1	0	0	149	24	20	70	0	325
8:30 AM	22	0	19	1	1	0	0	150	13	23	86	0	315
8:45 AM	33	1	43	1	1	0	0	163	16	16	76	1	351
VOLUMES	402	4	419	5	27	6	4	1,636	217	337	739	24	3,820
APPROACH %	49%	0%	51%	13%	71%	16%	0%	88%	12%	31%	67%	2%	
APP/DEPART	825	/	31	38	/	581	1,857	/	2,060	1,100	/	1,148	0
BEGIN PEAK HR		7:00 AM											
VOLUMES	306	3	293	3	22	5	4	995	148	255	427	22	2,483
APPROACH %	51%	0%	49%	10%	73%	17%	0%	87%	13%	36%	61%	3%	
PEAK HR FACTOR		0.681			0.625			0.719			0.674		0.873
APP/DEPART	602	/	28	30	/	425	1,147	/	1,291	704	/	739	0
PM 4:00 PM	50	1	46	2	2	1	1	153	22	35	211	1	525
4:15 PM	63	1	34	1	2	0	0	149	28	50	260	2	590
4:30 PM	74	1	37	1	3	0	1	159	25	39	235	1	576
4:45 PM	68	0	35	2	1	0	0	183	21	54	243	2	609
5:00 PM	55	1	26	0	0	2	0	185	26	41	272	2	610
5:15 PM	50	1	34	1	0	0	0	148	26	33	269	1	563
5:30 PM	54	0	42	1	0	1	0	186	21	47	279	2	633
5:45 PM	51	2	38	0	1	2	0	183	18	35	255	2	587
VOLUMES	465	7	292	8	9	6	2	1,346	187	334	2,024	13	4,693
APPROACH %	61%	1%	38%	35%	39%	26%	0%	88%	12%	14%	85%	1%	
APP/DEPART	764	/	22	23	/	530	1,535	/	1,646	2,371	/	2,495	0
BEGIN PEAK HR		4:45 PM											
VOLUMES	227	2	137	4	1	3	0	702	94	175	1,063	7	2,415
APPROACH %	62%	1%	37%	50%	13%	38%	0%	88%	12%	14%	85%	1%	
PEAK HR FACTOR		0.888			0.667			0.943			0.949		0.954
APP/DEPART	366	/	9	8	/	270	796	/	843	1,245	/	1,293	0

	U-TURNS				
	NB	SB	EB	WB	TTL
LANES:	0	0	0	0	
7:00 AM	0	0	0	0	0
7:15 AM	0	0	0	0	0
7:30 AM	0	0	0	0	0
7:45 AM	0	0	1	0	1
8:00 AM	0	0	0	0	0
8:15 AM	0	0	0	0	0
8:30 AM	0	0	0	0	0
8:45 AM	0	0	0	0	0
VOLUMES	0	0	1	0	1
4:00 PM	0	0	0	0	0
4:15 PM	0	0	0	0	0
4:30 PM	0	0	0	0	0
4:45 PM	0	0	0	0	0
5:00 PM	0	0	0	0	0
5:15 PM	0	0	0	0	0
5:30 PM	0	0	0	0	0
5:45 PM	0	0	0	0	0
VOLUMES	0	0	0	0	0



	PEDESTRIAN + BIKE CROSSINGS					PEDESTRIAN CROSSINGS					BICYCLE CROSSINGS				
	N SIDE	S SIDE	E SIDE	W SIDE	TOTAL	N SIDE	S SIDE	E SIDE	W SIDE	TOTAL	NS	SS	ES	WS	TOTAL
AM 7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	1	0	0	0	1	1	0	0	0	1	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	2	0	0	2	0	1	0	0	1	0	1	0	0	1
8:45 AM	1	0	0	0	1	0	0	0	0	0	1	0	0	0	1
TOTAL	2	2	0	0	4	1	1	0	0	2	1	1	0	0	2
PM 4:00 PM	0	2	0	0	2	0	2	0	0	2	0	0	0	0	0
4:15 PM	2	2	2	0	6	2	2	2	0	6	0	0	0	0	0
4:30 PM	1	0	0	0	1	0	0	0	0	0	1	0	0	0	1
4:45 PM	2	1	0	0	3	2	1	0	0	3	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	1	0	0	1	0	1	0	0	1	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	5	6	2	0	13	4	6	2	0	12	1	0	0	0	1

INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 cs@aimtd.com

DATE:	LOCATION:	Palmdale	PROJECT #:	SC1565
Wed, Jan 24, 18	NORTH & SOUTH:	20th	LOCATION #:	3
	EAST & WEST:	Rancho Vista	CONTROL:	SIGNAL

NOTES:

AM
PM
MD
OTHER
OTHER

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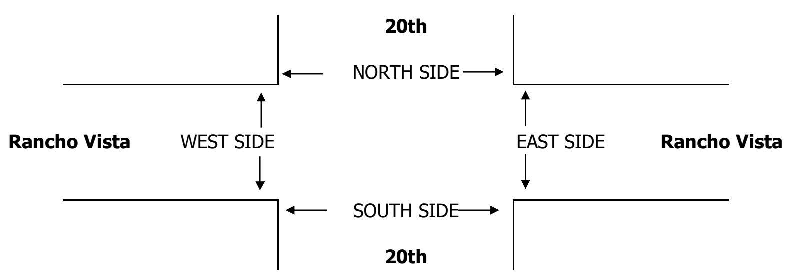
Add U-Turns to Left Turns

	NORTHBOUND 20th			SOUTHBOUND 20th			EASTBOUND Rancho Vista			WESTBOUND Rancho Vista			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	1	1	1	1	1	1	2	1	1	2	1	
AM 7:00 AM	10	21	36	7	26	43	29	221	5	69	154	7	628
7:15 AM	18	35	26	7	18	40	38	234	4	13	176	13	622
7:30 AM	6	30	15	11	8	8	48	326	5	5	101	7	570
7:45 AM	3	29	16	5	2	10	49	353	13	3	104	8	595
8:00 AM	4	15	8	11	9	14	23	181	3	8	84	5	365
8:15 AM	3	16	15	13	13	9	18	169	4	7	87	9	363
8:30 AM	2	14	7	15	9	16	15	134	1	9	83	3	308
8:45 AM	0	15	9	16	9	13	24	195	2	6	78	3	370
VOLUMES	46	175	132	85	94	153	244	1,813	37	120	867	55	3,821
APPROACH %	13%	50%	37%	26%	28%	46%	12%	87%	2%	12%	83%	5%	
APP/DEPART	353	/	474	332	/	251	2,094	/	2,030	1,042	/	1,066	0
BEGIN PEAK HR		7:00 AM											
VOLUMES	37	115	93	30	54	101	164	1,134	27	90	535	35	2,415
APPROACH %	15%	47%	38%	16%	29%	55%	12%	86%	2%	14%	81%	5%	
PEAK HR FACTOR		0.775			0.609			0.798			0.717		0.961
APP/DEPART	245	/	314	185	/	171	1,325	/	1,257	660	/	673	0
PM 4:00 PM	4	10	12	22	17	28	22	172	3	22	217	14	543
4:15 PM	7	11	8	14	13	44	20	166	9	16	259	10	577
4:30 PM	6	14	12	12	22	36	21	169	4	16	252	9	573
4:45 PM	3	15	8	17	27	41	20	186	9	24	274	15	639
5:00 PM	7	8	6	14	28	33	18	172	8	23	264	18	599
5:15 PM	6	10	12	15	23	38	22	156	2	13	271	9	577
5:30 PM	3	8	6	19	18	38	16	201	5	14	281	13	622
5:45 PM	3	9	9	20	19	35	34	187	0	28	269	10	623
VOLUMES	39	85	73	133	167	293	173	1,409	40	156	2,087	98	4,753
APPROACH %	20%	43%	37%	22%	28%	49%	11%	87%	2%	7%	89%	4%	
APP/DEPART	197	/	356	593	/	363	1,622	/	1,615	2,341	/	2,419	0
BEGIN PEAK HR		4:45 PM											
VOLUMES	19	41	32	65	96	150	76	715	24	74	1,090	55	2,437
APPROACH %	21%	45%	35%	21%	31%	48%	9%	88%	3%	6%	89%	5%	
PEAK HR FACTOR		0.821			0.915			0.918			0.974		0.953
APP/DEPART	92	/	172	311	/	194	815	/	812	1,219	/	1,259	0

U-TURNS

	NB	SB	EB	WB	TTL
LANES	0	0	0	0	
7:00 AM	0	0	0	0	0
7:15 AM	0	0	0	0	0
7:30 AM	0	0	0	0	0
7:45 AM	0	0	0	0	0
8:00 AM	0	0	0	0	0
8:15 AM	0	0	0	0	0
8:30 AM	0	0	0	0	0
8:45 AM	0	0	0	0	0
VOLUMES	0	0	0	0	0
4:00 PM	0	0	0	0	0
4:15 PM	0	0	0	0	0
4:30 PM	0	0	0	0	0
4:45 PM	0	0	0	0	0
5:00 PM	0	0	0	0	0
5:15 PM	0	0	0	0	0
5:30 PM	0	0	0	0	0
5:45 PM	0	0	0	0	0
VOLUMES	0	0	0	0	0



	PEDESTRIAN + BIKE CROSSINGS					PEDESTRIAN CROSSINGS					BICYCLE CROSSINGS				
	N SIDE	S SIDE	E SIDE	W SIDE	TOTAL	N SIDE	S SIDE	E SIDE	W SIDE	TOTAL	NS	SS	ES	WS	TOTAL
AM 7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	1	0	0	0	1	1	0	0	0	1	0	0	0	0	0
8:00 AM	0	2	0	0	2	0	1	0	0	1	0	1	0	0	1
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	1	0	0	1	0	1	0	0	1	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	1	3	0	0	4	1	2	0	0	3	0	1	0	0	1
PM 4:00 PM	0	2	0	2	4	0	2	0	2	4	0	0	0	0	0
4:15 PM	0	1	0	0	1	0	1	0	0	1	0	0	0	0	0
4:30 PM	1	0	0	0	1	0	0	0	0	0	1	0	0	0	1
4:45 PM	0	1	0	0	1	0	1	0	0	1	0	0	0	0	0
5:00 PM	0	2	0	0	2	0	2	0	0	2	0	0	0	0	0
5:15 PM	0	1	2	0	3	0	1	2	0	3	0	0	0	0	0
5:30 PM	0	1	0	0	1	0	1	0	0	1	0	0	0	0	0
5:45 PM	0	1	0	0	1	0	1	0	0	1	0	0	0	0	0
TOTAL	1	9	2	2	14	0	9	2	2	13	1	0	0	0	1

INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 cs@aimtd.com

T816

DATE:	LOCATION:	Palmdale	PROJECT #:	SC1565
Wed, Jan 24, 18	NORTH & SOUTH:	Summerwind	LOCATION #:	4
	EAST & WEST:	Rancho Vista	CONTROL:	SIGNAL

NOTES:

AM PM MD OTHER OTHER

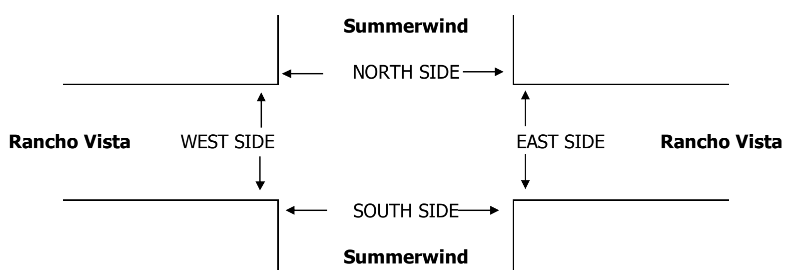
N ◄ W E ► S

Add U-Turns to Left Turns

	NORTHBOUND Summerwind			SOUTHBOUND Summerwind			EASTBOUND Rancho Vista			WESTBOUND Rancho Vista			TOTAL
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	2	0	1	2	0	1	3	0	1	2	1	
AM													
7:00 AM	13	24	96	0	18	2	2	271	33	90	208	2	759
7:15 AM	8	25	136	10	6	3	12	290	8	38	148	6	690
7:30 AM	2	18	92	7	9	4	8	361	2	18	110	2	633
7:45 AM	3	11	51	9	5	6	14	343	5	10	100	10	567
8:00 AM	2	4	36	6	2	4	5	189	4	16	100	7	375
8:15 AM	2	8	31	4	3	8	4	199	3	18	103	3	386
8:30 AM	3	7	39	5	6	3	7	184	5	15	92	6	372
8:45 AM	0	15	42	5	2	1	11	206	2	8	107	7	406
VOLUMES	33	112	523	46	51	31	63	2,043	62	213	968	43	4,188
APPROACH %	5%	17%	78%	36%	40%	24%	3%	94%	3%	17%	79%	4%	
APP/DEPART	668	/	218	128	/	326	2,168	/	2,612	1,224	/	1,032	0
BEGIN PEAK HR		7:00 AM											
VOLUMES	26	78	375	26	38	15	36	1,265	48	156	566	20	2,649
APPROACH %	5%	16%	78%	33%	48%	19%	3%	94%	4%	21%	76%	3%	
PEAK HR FACTOR		0.709			0.988			0.909			0.618		0.873
APP/DEPART	479	/	134	79	/	242	1,349	/	1,666	742	/	607	0
PM													
4:00 PM	5	13	23	11	22	21	12	175	2	31	246	18	579
4:15 PM	5	8	36	6	10	23	23	173	4	34	292	14	628
4:30 PM	3	8	42	17	9	25	19	189	1	34	270	26	643
4:45 PM	7	15	45	14	13	28	19	168	10	39	304	19	681
5:00 PM	5	13	31	18	13	30	14	199	3	32	329	16	703
5:15 PM	5	10	45	14	18	20	25	180	6	51	293	22	689
5:30 PM	8	14	24	12	13	20	27	196	7	45	309	30	705
5:45 PM	3	11	36	8	13	20	21	181	5	33	280	19	630
VOLUMES	41	92	282	100	111	187	160	1,461	38	299	2,323	164	5,258
APPROACH %	10%	22%	68%	25%	28%	47%	10%	88%	2%	11%	83%	6%	
APP/DEPART	415	/	416	398	/	448	1,659	/	1,843	2,786	/	2,551	0
BEGIN PEAK HR		4:45 PM											
VOLUMES	25	52	145	58	57	98	85	743	26	167	1,235	87	2,778
APPROACH %	11%	23%	65%	27%	27%	46%	10%	87%	3%	11%	83%	6%	
PEAK HR FACTOR		0.828			0.873			0.928			0.969		0.985
APP/DEPART	222	/	224	213	/	250	854	/	946	1,489	/	1,358	0

U-TURNS

	NB	SB	EB	WB	TTL
	0	0	0	0	
7:00 AM	0	0	0	0	0
7:15 AM	0	0	0	0	0
7:30 AM	0	0	0	0	0
7:45 AM	0	0	0	0	0
8:00 AM	0	0	0	0	0
8:15 AM	0	0	0	0	0
8:30 AM	0	0	0	0	0
8:45 AM	0	0	0	0	0
VOLUMES	0	0	0	0	0
4:00 PM	0	0	0	0	0
4:15 PM	0	0	0	0	0
4:30 PM	0	0	0	0	0
4:45 PM	0	0	0	0	0
5:00 PM	0	0	0	0	0
5:15 PM	0	0	0	0	0
5:30 PM	0	0	0	0	0
5:45 PM	0	0	0	0	0
VOLUMES	0	0	0	0	0



	PEDESTRIAN + BIKE CROSSINGS					PEDESTRIAN CROSSINGS					BICYCLE CROSSINGS				
	N SIDE	S SIDE	E SIDE	W SIDE	TOTAL	N SIDE	S SIDE	E SIDE	W SIDE	TOTAL	NS	SS	ES	WS	TOTAL
AM															
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	1	0	1	0	0	1	0	1	0	0	0	0	0
7:30 AM	0	0	1	0	1	0	0	0	0	0	0	0	1	0	1
7:45 AM	3	0	0	0	3	3	0	0	0	3	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	1	1	0	2	0	1	1	0	2	0	0	0	0	0
8:30 AM	1	0	1	2	4	1	0	1	2	4	0	0	0	0	0
8:45 AM	2	0	1	1	4	2	0	1	1	4	0	0	0	0	0
TOTAL	6	1	5	3	15	6	1	4	3	14	0	0	1	0	1
PM															
4:00 PM	2	1	1	0	4	2	1	1	0	4	0	0	0	0	0
4:15 PM	0	3	3	1	7	0	3	1	1	5	0	0	2	0	2
4:30 PM	1	0	1	2	4	0	0	1	0	1	1	0	0	2	3
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	1	0	0	1	2	1	0	0	1	2	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	1	0	1	0	2	1	0	1	0	2	0	0	0	0	0
5:45 PM	1	1	1	0	3	1	1	1	0	3	0	0	0	0	0
TOTAL	6	5	7	4	22	5	5	5	2	17	1	0	2	2	5

T816

INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 cs@aimtd.com

DATE:	LOCATION:	Palmdale	PROJECT #:	SC1565
Wed, Jan 24, 18	NORTH & SOUTH:	AV Mall	LOCATION #:	5
	EAST & WEST:	Rancho Vista	CONTROL:	SIGNAL

NOTES:

AM
PM
MD
OTHER
OTHER

▲ N
◄ W
E ►
S ▼

Add U-Turns to Left Turns

	NORTHBOUND AV Mall			SOUTHBOUND AV Mall			EASTBOUND Rancho Vista			WESTBOUND Rancho Vista			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	X	X	X	2	X	1	1	3	X	X	3	0	
AM 7:00 AM	0	0	0	5	0	3	8	360	0	0	298	4	678
7:15 AM	0	0	0	6	0	7	10	427	0	0	186	2	638
7:30 AM	0	0	0	1	0	6	25	436	0	0	125	5	598
7:45 AM	0	0	0	6	0	7	26	378	0	0	114	13	544
8:00 AM	0	0	0	8	0	2	11	220	0	0	122	11	374
8:15 AM	0	0	0	6	0	6	10	224	0	0	118	19	383
8:30 AM	0	0	0	7	0	7	15	213	0	0	106	14	362
8:45 AM	0	0	0	9	0	11	27	226	0	0	111	24	408
VOLUMES	0	0	0	48	0	49	132	2,484	0	0	1,180	92	3,985
APPROACH %	0%	0%	0%	49%	0%	51%	5%	95%	0%	0%	93%	7%	
APP/DEPART	0	/	224	97	/	0	2,616	/	2,532	1,272	/	1,229	0
BEGIN PEAK HR		7:00 AM											
VOLUMES	0	0	0	18	0	23	69	1,601	0	0	723	24	2,458
APPROACH %	0%	0%	0%	44%	0%	56%	4%	96%	0%	0%	97%	3%	
PEAK HR FACTOR		0.000			0.788			0.906			0.618		0.906
APP/DEPART	0	/	93	41	/	0	1,670	/	1,619	747	/	746	0
PM 4:00 PM	0	0	0	23	0	19	27	183	0	1	277	29	559
4:15 PM	0	0	0	26	0	35	22	194	0	0	306	26	609
4:30 PM	0	0	0	28	0	26	32	217	0	0	304	20	627
4:45 PM	0	0	0	29	0	43	23	205	0	0	319	32	651
5:00 PM	0	0	0	20	0	33	29	220	0	0	344	20	666
5:15 PM	0	0	0	24	0	44	28	212	0	0	322	29	659
5:30 PM	0	0	0	25	0	39	25	207	0	0	345	23	664
5:45 PM	0	0	0	23	0	36	31	194	0	0	296	18	598
VOLUMES	0	0	0	198	0	275	217	1,632	0	1	2,513	197	5,033
APPROACH %	0%	0%	0%	42%	0%	58%	12%	88%	0%	0%	93%	7%	
APP/DEPART	0	/	414	473	/	0	1,849	/	1,830	2,711	/	2,789	0
BEGIN PEAK HR		4:45 PM											
VOLUMES	0	0	0	98	0	159	105	844	0	0	1,330	104	2,640
APPROACH %	0%	0%	0%	38%	0%	62%	11%	89%	0%	0%	93%	7%	
PEAK HR FACTOR		0.000			0.892			0.953			0.974		0.991
APP/DEPART	0	/	209	257	/	0	949	/	942	1,434	/	1,489	0

U-TURNS	NB	SB	EB	WB	TTL
	0	0	0	0	
7:00 AM	0	0	0	0	0
7:15 AM	0	0	0	0	0
7:30 AM	0	0	0	0	0
7:45 AM	0	0	0	0	0
8:00 AM	0	0	0	0	0
8:15 AM	0	0	0	0	0
8:30 AM	0	0	0	0	0
8:45 AM	0	0	0	0	0
VOLUMES	0	0	0	0	0
4:00 PM	0	0	0	1	1
4:15 PM	0	1	0	0	1
4:30 PM	0	0	1	0	1
4:45 PM	0	0	0	0	0
5:00 PM	0	0	0	0	0
5:15 PM	0	0	0	0	0
5:30 PM	0	0	0	0	0
5:45 PM	0	0	0	0	0
VOLUMES	0	1	1	1	3

AV Mall

NORTH SIDE

Rancho Vista WEST SIDE EAST SIDE **Rancho Vista**

SOUTH SIDE

AV Mall

		PEDESTRIAN + BIKE CROSSINGS					PEDESTRIAN CROSSINGS					BICYCLE CROSSINGS				
		N SIDE	S SIDE	E SIDE	W SIDE	TOTAL	N SIDE	S SIDE	E SIDE	W SIDE	TOTAL	NS	SS	ES	WS	TOTAL
AM	7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:15 AM	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1
	8:30 AM	1	1	0	1	3	1	0	0	1	2	0	1	0	0	1
	8:45 AM	1	0	0	0	1	1	0	0	0	1	0	0	0	0	0
	TOTAL	2	2	0	1	5	2	0	0	1	3	0	2	0	0	2
PM	4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:15 PM	0	0	0	2	2	0	0	0	2	2	0	0	0	0	0
	4:30 PM	2	0	0	0	2	1	0	0	0	1	1	0	0	0	1
	4:45 PM	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1
	5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:15 PM	0	0	0	1	1	0	0	0	1	1	0	0	0	0	0
	5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:45 PM	1	0	0	0	1	1	0	0	0	1	0	0	0	0	0
	TOTAL	3	1	0	3	7	2	0	0	3	5	1	1	0	0	2

INTERSECTION TURNING MOVEMENT COUNTS

T816

PREPARED BY: AimTD LLC. tel: 714 253 7888 cs@aimtd.com

DATE:	LOCATION:	Palmdale	PROJECT #:	SC1565
Wed, Jan 24, 18	NORTH & SOUTH:	Armfield	LOCATION #:	6
	EAST & WEST:	Rancho Vista	CONTROL:	SIGNAL

NOTES:

AM / PM / MD / OTHER / OTHER

▲ N / ◄ W / E ► / S ▼

Add U-Turns to Left Turns

	NORTHBOUND Armfield			SOUTHBOUND Armfield			EASTBOUND Rancho Vista			WESTBOUND Rancho Vista			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	0	1	0	1.5	0.5	1	1	3	0	1	3	1	
AM 7:00 AM	5	0	5	7	0	8	4	360	1	2	289	7	688
7:15 AM	3	1	1	8	0	4	5	426	1	6	180	8	643
7:30 AM	3	0	2	5	0	4	6	430	0	3	122	14	589
7:45 AM	1	0	4	2	0	4	12	370	1	4	121	12	531
8:00 AM	1	0	5	10	0	6	5	222	1	4	125	19	398
8:15 AM	0	2	5	9	1	3	4	226	0	9	134	18	411
8:30 AM	2	2	2	15	1	4	4	216	0	12	114	25	397
8:45 AM	3	0	3	14	0	3	4	230	1	5	129	17	409
VOLUMES	18	5	27	70	2	36	44	2,480	5	45	1,214	120	4,066
APPROACH %	36%	10%	54%	65%	2%	33%	2%	98%	0%	3%	88%	9%	
APP/DEPART	50	/	169	108	/	28	2,529	/	2,601	1,379	/	1,268	0
BEGIN PEAK HR		7:00 AM											
VOLUMES	12	1	12	22	0	20	27	1,586	3	15	712	41	2,451
APPROACH %	48%	4%	48%	52%	0%	48%	2%	98%	0%	2%	93%	5%	
PEAK HR FACTOR		0.625			0.700			0.927			0.644		0.891
APP/DEPART	25	/	69	42	/	8	1,616	/	1,630	768	/	744	0
PM 4:00 PM	3	0	2	70	0	8	6	201	1	16	300	67	674
4:15 PM	1	0	4	69	0	15	8	210	0	16	315	79	717
4:30 PM	0	0	2	45	0	19	9	233	2	11	304	75	700
4:45 PM	0	0	7	72	2	18	10	221	2	21	333	103	789
5:00 PM	0	0	1	89	0	19	6	233	0	13	345	86	792
5:15 PM	1	0	2	73	1	17	15	218	2	24	332	98	783
5:30 PM	0	3	3	68	0	16	11	220	1	8	352	81	763
5:45 PM	1	1	2	67	1	26	18	198	1	14	287	94	710
VOLUMES	6	4	23	553	4	138	83	1,734	9	123	2,568	683	5,928
APPROACH %	18%	12%	70%	80%	1%	20%	5%	95%	0%	4%	76%	20%	
APP/DEPART	33	/	769	695	/	96	1,826	/	2,350	3,374	/	2,713	0
BEGIN PEAK HR		4:45 PM											
VOLUMES	1	3	13	302	3	70	42	892	5	66	1,362	368	3,127
APPROACH %	6%	18%	76%	81%	1%	19%	4%	95%	1%	4%	76%	20%	
PEAK HR FACTOR		0.607			0.868			0.982			0.982		0.987
APP/DEPART	17	/	412	375	/	49	939	/	1,232	1,796	/	1,434	0

U-TURNS

	NB	SB	EB	WB	TTL
	0	0	0	0	
7:00 AM	0	0	0	2	2
7:15 AM	0	0	0	3	3
7:30 AM	0	0	0	1	1
7:45 AM	0	0	0	4	4
8:00 AM	0	0	0	1	1
8:15 AM	0	0	0	4	4
8:30 AM	0	0	0	7	7
8:45 AM	0	0	0	2	2
VOLUMES	0	0	0	24	24
4:00 PM	0	0	0	4	4
4:15 PM	0	0	0	2	2
4:30 PM	0	0	0	3	3
4:45 PM	0	0	0	5	5
5:00 PM	0	0	0	6	6
5:15 PM	0	0	1	12	13
5:30 PM	0	0	0	2	2
5:45 PM	0	0	0	6	6
VOLUMES	0	0	1	40	41

Armfield

NORTH SIDE

Rancho Vista WEST SIDE EAST SIDE **Rancho Vista**

SOUTH SIDE

Armfield

	PEDESTRIAN + BIKE CROSSINGS					PEDESTRIAN CROSSINGS					BICYCLE CROSSINGS				
	N SIDE	S SIDE	E SIDE	W SIDE	TOTAL	N SIDE	S SIDE	E SIDE	W SIDE	TOTAL	NS	SS	ES	WS	TOTAL
AM 7:00 AM	1	1	0	0	2	1	1	0	0	2	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	1	1	1	3	0	1	1	1	3	0	0	0	0	0
8:00 AM	0	3	0	0	3	0	3	0	0	3	0	0	0	0	0
8:15 AM	1	0	1	0	2	1	0	1	0	2	0	0	0	0	0
8:30 AM	1	2	0	0	3	1	0	0	0	1	0	2	0	0	2
8:45 AM	1	1	0	0	2	1	1	0	0	2	0	0	0	0	0
TOTAL	4	8	2	1	15	4	6	2	1	13	0	2	0	0	2
PM 4:00 PM	0	5	0	1	6	0	5	0	1	6	0	0	0	0	0
4:15 PM	1	3	0	1	5	1	3	0	1	5	0	0	0	0	0
4:30 PM	2	2	0	2	6	1	1	0	1	3	1	1	0	1	3
4:45 PM	1	2	0	1	4	1	1	0	1	3	0	1	0	0	1
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	1	0	1	2	0	1	0	1	2	0	0	0	0	0
5:30 PM	0	1	0	1	2	0	1	0	1	2	0	0	0	0	0
5:45 PM	2	0	0	0	2	2	0	0	0	2	0	0	0	0	0
TOTAL	6	14	0	7	27	5	12	0	6	23	1	2	0	1	4

INTERSECTION TURNING MOVEMENT COUNTS

T816

PREPARED BY: AimTD LLC. tel: 714 253 7888 cs@aimtd.com

DATE:	LOCATION:	Palmdale	PROJECT #:	SC1565
Wed, Jan 24, 18	NORTH & SOUTH:	10th	LOCATION #:	7
	EAST & WEST:	Rancho Vista	CONTROL:	SIGNAL

NOTES:

AM
PM
MD
OTHER
OTHER

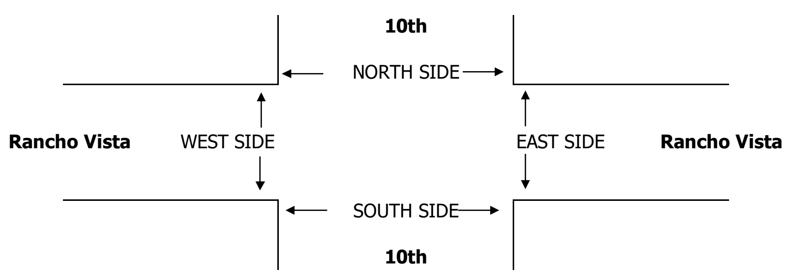
▲ N
◄ W
E ►
S ▼

Add U-Turns to Left Turns

		NORTHBOUND 10th			SOUTHBOUND 10th			EASTBOUND Rancho Vista			WESTBOUND Rancho Vista			TOTAL
		NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
	LANES:	2	3	1	2	3	0	2	3	1	2	3	1	
AM	7:00 AM	61	58	10	62	49	30	33	226	75	10	203	42	859
AM	7:15 AM	48	87	3	83	100	24	62	267	86	12	141	60	973
AM	7:30 AM	29	110	9	89	89	9	73	280	103	11	91	58	951
AM	7:45 AM	41	141	14	115	160	10	56	263	107	27	90	80	1,104
AM	8:00 AM	42	106	24	73	134	8	31	172	98	24	85	61	858
AM	8:15 AM	61	155	26	83	117	13	38	138	60	19	83	69	862
AM	8:30 AM	36	94	14	67	106	14	29	138	69	22	105	59	753
AM	8:45 AM	47	124	22	94	126	9	40	138	84	26	102	91	903
AM	VOLUMES	365	875	122	666	881	117	362	1,622	682	151	900	520	7,263
AM	APPROACH %	27%	64%	9%	40%	53%	7%	14%	61%	26%	10%	57%	33%	
AM	APP/DEPART	1,362	/	1,747	1,664	/	1,703	2,666	/	2,421	1,571	/	1,392	0
AM	BEGIN PEAK HR		7:00 AM											
AM	VOLUMES	179	396	36	349	398	73	224	1,036	371	60	525	240	3,887
AM	APPROACH %	29%	65%	6%	43%	49%	9%	14%	64%	23%	7%	64%	29%	
AM	PEAK HR FACTOR		0.779			0.719			0.894			0.809		0.880
AM	APP/DEPART	611	/	856	820	/	824	1,631	/	1,426	825	/	781	0
PM	4:00 PM	118	193	19	116	228	44	34	171	73	49	219	155	1,419
PM	4:15 PM	125	181	21	123	217	41	39	161	78	46	242	143	1,417
PM	4:30 PM	131	202	22	111	217	33	45	153	114	38	240	131	1,437
PM	4:45 PM	135	171	22	125	216	48	40	171	104	40	278	150	1,500
PM	5:00 PM	150	214	22	107	234	30	40	172	101	47	247	144	1,508
PM	5:15 PM	144	192	19	126	245	35	39	166	104	40	265	157	1,532
PM	5:30 PM	150	181	13	143	220	40	38	149	102	45	245	118	1,444
PM	5:45 PM	118	175	19	133	240	52	47	152	81	43	235	122	1,417
PM	VOLUMES	1,071	1,509	157	984	1,817	323	322	1,295	757	348	1,971	1,120	11,674
PM	APPROACH %	39%	55%	6%	31%	58%	10%	14%	55%	32%	10%	57%	33%	
PM	APP/DEPART	2,737	/	2,937	3,124	/	2,913	2,374	/	2,446	3,439	/	3,378	0
PM	BEGIN PEAK HR		4:45 PM											
PM	VOLUMES	579	758	76	501	915	153	157	658	411	172	1,035	569	5,984
PM	APPROACH %	41%	54%	5%	32%	58%	10%	13%	54%	34%	10%	58%	32%	
PM	PEAK HR FACTOR		0.915			0.966			0.973			0.949		0.977
PM	APP/DEPART	1,413	/	1,475	1,569	/	1,492	1,226	/	1,241	1,776	/	1,776	0

U-TURNS

	NB	SB	EB	WB	TTL
LANES	0	0	0	0	
7:00 AM	0	0	0	2	2
7:15 AM	0	0	2	0	2
7:30 AM	0	0	0	1	1
7:45 AM	0	0	2	2	4
8:00 AM	0	0	1	2	3
8:15 AM	0	0	3	2	5
8:30 AM	0	0	1	0	1
8:45 AM	0	0	1	2	3
AM VOLUMES	0	0	10	11	21
4:00 PM	0	1	2	2	5
4:15 PM	0	0	0	0	0
4:30 PM	1	0	1	1	3
4:45 PM	0	0	2	1	3
5:00 PM	0	0	3	1	4
5:15 PM	0	0	1	3	4
5:30 PM	0	0	3	1	4
5:45 PM	1	0	3	2	6
PM VOLUMES	2	1	15	11	29



PEDESTRIAN + BIKE CROSSINGS

		N SIDE	S SIDE	E SIDE	W SIDE	TOTAL
AM	7:00 AM	1	0	0	0	1
AM	7:15 AM	0	0	0	0	0
AM	7:30 AM	0	0	0	1	1
AM	7:45 AM	0	0	0	0	0
AM	8:00 AM	2	2	0	0	4
AM	8:15 AM	0	0	2	1	3
AM	8:30 AM	1	2	2	0	5
AM	8:45 AM	0	1	1	0	2
AM	TOTAL	4	5	5	2	16
PM	4:00 PM	0	2	2	1	5
PM	4:15 PM	0	8	4	6	18
PM	4:30 PM	2	1	4	1	8
PM	4:45 PM	3	2	5	6	16
PM	5:00 PM	2	2	1	3	8
PM	5:15 PM	0	1	1	2	4
PM	5:30 PM	0	4	0	4	8
PM	5:45 PM	1	1	3	1	6
PM	TOTAL	8	21	20	24	73

PEDESTRIAN CROSSINGS

		N SIDE	S SIDE	E SIDE	W SIDE	TOTAL
AM	7:00 AM	1	0	0	0	1
AM	7:15 AM	0	0	0	0	0
AM	7:30 AM	0	0	0	1	1
AM	7:45 AM	0	0	0	0	0
AM	8:00 AM	2	2	0	0	4
AM	8:15 AM	0	0	2	1	3
AM	8:30 AM	1	2	2	0	5
AM	8:45 AM	0	1	1	0	2
AM	TOTAL	4	5	5	2	16
PM	4:00 PM	0	1	2	0	3
PM	4:15 PM	0	6	3	5	14
PM	4:30 PM	1	1	2	1	5
PM	4:45 PM	3	1	4	6	14
PM	5:00 PM	2	2	1	2	7
PM	5:15 PM	0	1	1	2	4
PM	5:30 PM	0	4	0	3	7
PM	5:45 PM	1	1	3	1	6
PM	TOTAL	7	17	16	20	60

BICYCLE CROSSINGS

		NS	SS	ES	WS	TOTAL
AM	7:00 AM	0	0	0	0	0
AM	7:15 AM	0	0	0	0	0
AM	7:30 AM	0	0	0	0	0
AM	7:45 AM	0	0	0	0	0
AM	8:00 AM	0	0	0	0	0
AM	8:15 AM	0	0	0	0	0
AM	8:30 AM	0	0	0	0	0
AM	8:45 AM	0	0	0	0	0
AM	TOTAL	0	0	0	0	0
PM	4:00 PM	0	1	0	1	2
PM	4:15 PM	0	2	1	1	4
PM	4:30 PM	1	0	2	0	3
PM	4:45 PM	0	1	1	0	2
PM	5:00 PM	0	0	0	1	1
PM	5:15 PM	0	0	0	0	0
PM	5:30 PM	0	0	0	1	1
PM	5:45 PM	0	0	0	0	0
PM	TOTAL	1	4	4	4	13

INTERSECTION TURNING MOVEMENT COUNTS

T816

PREPARED BY: AimTD LLC. tel: 714 253 7888 cs@aimtd.com

DATE:	LOCATION:	Palmdale	PROJECT #:	SC1565
Wed, Jan 24, 18	NORTH & SOUTH:	Lowes	LOCATION #:	8
	EAST & WEST:	Rancho Vista	CONTROL:	SIGNAL

NOTES:

AM PM MD OTHER OTHER

▲ N ◄ W E ► S ▼

Add U-Turns to Left Turns

	NORTHBOUND Lowes			SOUTHBOUND Lowes			EASTBOUND Rancho Vista			WESTBOUND Rancho Vista				U-TURNS				
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL	NB	SB	EB	WB	TTL
LANES:	1	1	1	1	2	0	1	3	1	1	3	1		0	0	0	0	
AM 7:00 AM	15	2	25	4	0	0	3	250	23	31	229	7	589	0	0	2	0	2
7:15 AM	19	0	31	0	1	1	3	329	39	30	213	2	668	0	0	2	0	2
7:30 AM	15	2	33	5	1	0	5	323	32	41	137	6	600	0	0	0	0	0
7:45 AM	23	4	39	3	4	0	5	344	60	26	184	7	699	0	0	1	0	1
8:00 AM	13	4	41	2	3	3	1	206	42	31	154	8	508	0	0	1	1	2
8:15 AM	21	5	37	6	4	2	3	241	39	39	150	7	554	0	0	0	0	0
8:30 AM	21	2	38	0	1	0	4	166	23	42	145	14	456	0	0	2	0	2
8:45 AM	23	3	40	6	3	2	5	206	48	41	185	14	576	0	0	1	0	1
VOLUMES	150	22	284	26	17	8	29	2,065	306	281	1,397	65	4,650	0	0	9	1	10
APPROACH %	33%	5%	62%	51%	33%	16%	1%	86%	13%	16%	80%	4%						
APP/DEPART	456	/	107	51	/	603	2,400	/	2,376	1,743	/	1,564	0					
BEGIN PEAK HR		7:00 AM																
VOLUMES	72	8	128	12	6	1	16	1,246	154	128	763	22	2,556					
APPROACH %	35%	4%	62%	63%	32%	5%	1%	88%	11%	14%	84%	2%						
PEAK HR FACTOR		0.788			0.679			0.866			0.855		0.914					
APP/DEPART	208	/	41	19	/	288	1,416	/	1,386	913	/	841	0					
PM 4:00 PM	53	15	56	15	10	3	11	244	49	54	355	21	886	0	0	7	0	7
4:15 PM	34	19	82	28	10	6	8	237	44	62	390	27	947	0	0	2	0	2
4:30 PM	47	11	59	22	8	4	7	219	38	85	368	22	890	0	0	2	0	2
4:45 PM	48	10	66	20	7	5	8	251	60	83	395	26	979	0	0	3	1	4
5:00 PM	51	17	88	18	8	7	15	252	37	86	389	34	1,002	0	0	3	0	3
5:15 PM	44	20	71	21	15	9	16	257	35	73	377	23	961	0	0	5	0	5
5:30 PM	34	22	76	27	14	6	11	253	38	47	351	26	905	0	0	4	0	4
5:45 PM	38	10	66	20	8	5	12	227	38	50	342	27	843	0	0	3	0	3
VOLUMES	349	124	564	171	80	45	88	1,940	339	540	2,967	206	7,413	0	0	29	1	30
APPROACH %	34%	12%	54%	58%	27%	15%	4%	82%	14%	15%	80%	6%						
APP/DEPART	1,037	/	389	296	/	958	2,367	/	2,676	3,713	/	3,390	0					
BEGIN PEAK HR		4:45 PM																
VOLUMES	177	69	301	86	44	27	50	1,013	170	289	1,512	109	3,847					
APPROACH %	32%	13%	55%	55%	28%	17%	4%	82%	14%	15%	79%	6%						
PEAK HR FACTOR		0.877			0.835			0.966			0.938		0.960					
APP/DEPART	547	/	213	157	/	502	1,233	/	1,401	1,910	/	1,731	0					

Lowes

NORTH SIDE

Rancho Vista WEST SIDE

EAST SIDE **Rancho Vista**

SOUTH SIDE

Lowes

	PEDESTRIAN + BIKE CROSSINGS					PEDESTRIAN CROSSINGS					BICYCLE CROSSINGS				
	N SIDE	S SIDE	E SIDE	W SIDE	TOTAL	N SIDE	S SIDE	E SIDE	W SIDE	TOTAL	NS	SS	ES	WS	TOTAL
AM 7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	1	1	0	0	2	1	1	0	0	2	0	0	0	0	0
8:15 AM	0	1	0	0	1	0	1	0	0	1	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	3	0	0	3	0	3	0	0	3	0	0	0	0	0
TOTAL	1	5	0	0	6	1	5	0	0	6	0	0	0	0	0
PM 4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	1	5	0	1	7	1	5	0	1	7	0	0	0	0	0
4:30 PM	1	0	0	0	1	0	0	0	0	0	1	0	0	0	1
4:45 PM	0	2	1	0	3	0	2	0	0	2	0	0	1	0	1
5:00 PM	2	2	1	1	6	1	2	1	0	4	1	0	0	1	2
5:15 PM	0	1	0	1	2	0	1	0	1	2	0	0	0	0	0
5:30 PM	0	0	1	0	1	0	0	1	0	1	0	0	0	0	0
5:45 PM	1	1	2	0	4	1	0	2	0	3	0	1	0	0	1
TOTAL	5	11	5	3	24	3	10	4	2	19	2	1	1	1	5

INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 cs@aimtd.com

DATE: Wed, Jan 24, 18	LOCATION:	Palmdale	PROJECT #:	SC1565
	NORTH & SOUTH:	SR-14 NB Ramp	LOCATION #:	9
	EAST & WEST:	Rancho Vista	CONTROL:	SIGNAL

NOTES:

AM PM MD OTHER OTHER

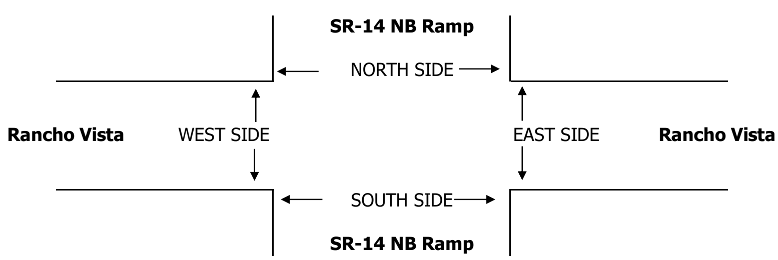
▲ N ◄ W E ► S ▼

Add U-Turns to Left Turns

	NORTHBOUND SR-14 NB Ramp			SOUTHBOUND SR-14 NB Ramp			EASTBOUND Rancho Vista			WESTBOUND Rancho Vista			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1.5	X	0.5	X	X	X	X	3	X	X	3	X	
AM 7:00 AM	98	0	63	0	0	0	0	193	0	0	180	0	534
7:15 AM	103	0	71	0	0	0	0	214	0	0	166	0	554
7:30 AM	77	0	55	0	0	0	0	241	0	0	119	0	492
7:45 AM	90	0	63	0	0	0	0	240	0	0	156	0	549
8:00 AM	65	0	49	0	0	0	0	168	0	0	162	0	444
8:15 AM	71	0	37	0	0	0	0	161	0	0	135	0	404
8:30 AM	84	0	48	0	0	0	0	119	0	0	135	0	386
8:45 AM	85	0	35	0	0	0	0	141	0	0	179	0	440
VOLUMES	673	0	421	0	0	0	0	1,477	0	0	1,232	0	3,803
APPROACH %	62%	0%	38%	0%	0%	0%	0%	100%	0%	0%	100%	0%	
APP/DEPART	1,094	/	0	0	/	0	1,477	/	1,898	1,232	/	1,905	0
BEGIN PEAK HR		7:00 AM											
VOLUMES	368	0	252	0	0	0	0	888	0	0	621	0	2,129
APPROACH %	59%	0%	41%	0%	0%	0%	0%	100%	0%	0%	100%	0%	
PEAK HR FACTOR		0.891			0.000			0.921			0.863		0.961
APP/DEPART	620	/	0	0	/	0	888	/	1,140	621	/	989	0
PM 4:00 PM	216	0	41	0	0	0	0	199	0	0	252	0	708
4:15 PM	213	0	34	0	0	0	0	215	0	0	281	0	743
4:30 PM	206	0	39	0	0	0	0	180	0	0	305	0	730
4:45 PM	239	0	33	0	0	0	0	223	0	0	305	0	800
5:00 PM	228	0	32	0	0	0	0	236	0	0	333	0	829
5:15 PM	213	0	35	0	0	0	0	239	0	0	307	0	794
5:30 PM	200	0	50	0	0	0	0	222	0	0	290	0	762
5:45 PM	194	0	35	0	0	0	0	194	0	0	281	0	704
VOLUMES	1,709	0	299	0	0	0	0	1,708	0	0	2,354	0	6,070
APPROACH %	85%	0%	15%	0%	0%	0%	0%	100%	0%	0%	100%	0%	
APP/DEPART	2,008	/	0	0	/	1	1,708	/	2,007	2,354	/	4,062	0
BEGIN PEAK HR		4:45 PM											
VOLUMES	880	0	150	0	0	0	0	920	0	0	1,235	0	3,185
APPROACH %	85%	0%	15%	0%	0%	0%	0%	100%	0%	0%	100%	0%	
PEAK HR FACTOR		0.947			0.000			0.962			0.927		0.960
APP/DEPART	1,030	/	0	0	/	0	920	/	1,070	1,235	/	2,115	0

U-TURNS

	NB	SB	EB	WB	TTL
LANES	0	0	0	0	
AM 7:00 AM	0	0	0	0	0
7:15 AM	0	0	0	0	0
7:30 AM	0	0	0	0	0
7:45 AM	0	0	0	0	0
8:00 AM	0	0	0	0	0
8:15 AM	0	0	0	0	0
8:30 AM	0	0	0	0	0
8:45 AM	0	0	0	0	0
VOLUMES	0	0	0	0	0
PM 4:00 PM	0	0	0	0	0
4:15 PM	1	0	0	0	1
4:30 PM	0	0	0	0	0
4:45 PM	0	0	0	0	0
5:00 PM	0	0	0	0	0
5:15 PM	0	0	0	0	0
5:30 PM	0	0	0	0	0
5:45 PM	0	0	0	0	0
VOLUMES	1	0	0	0	1



	PEDESTRIAN + BIKE CROSSINGS					PEDESTRIAN CROSSINGS					BICYCLE CROSSINGS				
	N SIDE	S SIDE	E SIDE	W SIDE	TOTAL	N SIDE	S SIDE	E SIDE	W SIDE	TOTAL	NS	SS	ES	WS	TOTAL
AM 7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	2	0	0	2	0	2	0	0	2	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	3	0	0	3	0	3	0	0	3	0	0	0	0	0
TOTAL	0	5	0	0	5	0	5	0	0	5	0	0	0	0	0
PM 4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	1	0	0	0	1	0	0	0	0	0	1	0	0	0	1
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	1	0	0	0	1	0	0	0	0	0	1	0	0	0	1
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	1	1	0	0	0	1	1	0	0	0	0	0
TOTAL	2	0	0	1	3	0	0	0	1	1	2	0	0	0	2

T816

INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 cs@aimtd.com

DATE:	LOCATION:	Palmdale	PROJECT #:	SC1565
Wed, Jan 24, 18	NORTH & SOUTH:	10th	LOCATION #:	10
	EAST & WEST:	AV Mall	CONTROL:	SIGNAL

NOTES:

AM
PM
MD
OTHER
OTHER

▲ N
◄ W E ►
S ▼

Add U-Turns to Left Turns

	NORTHBOUND 10th			SOUTHBOUND 10th			EASTBOUND AV Mall			WESTBOUND AV Mall				U-TURNS				
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL	NB	SB	EB	WB	TTL
LANES:	2	3	0	1	3	1	1	1	1	1	1	1		0	0	0	0	
AM 7:00 AM	3	137	1	3	149	6	2	0	7	0	0	4	312	0	1	0	0	1
7:15 AM	3	205	2	8	198	6	5	2	6	0	0	4	439	0	2	0	0	2
7:30 AM	4	245	3	13	199	18	7	0	7	0	2	5	503	0	2	0	0	2
7:45 AM	8	256	2	2	252	21	11	2	7	2	2	3	568	0	0	0	0	0
8:00 AM	9	203	4	10	206	11	10	3	5	0	2	6	469	0	0	0	0	0
8:15 AM	11	232	4	7	193	27	8	3	7	1	1	10	504	1	2	0	0	3
8:30 AM	8	179	3	7	197	22	6	0	8	1	0	10	441	0	2	0	0	2
8:45 AM	6	225	10	11	213	26	13	3	6	2	1	7	523	0	1	1	0	2
VOLUMES	52	1,682	29	61	1,607	137	62	13	53	6	8	49	3,759	1	10	1	0	12
APPROACH %	3%	95%	2%	3%	89%	8%	48%	10%	41%	10%	13%	78%						
APP/DEPART	1,763	/	1,802	1,805	/	1,667	128	/	93	63	/	197	0					
BEGIN PEAK HR		7:30 AM																
VOLUMES	32	936	13	32	850	77	36	8	26	3	7	24	2,044					
APPROACH %	3%	95%	1%	3%	89%	8%	51%	11%	37%	9%	21%	71%						
PEAK HR FACTOR		0.922			0.872			0.875			0.708		0.900					
APP/DEPART	981	/	1,000	959	/	880	70	/	49	34	/	115	0					
PM 4:00 PM	41	322	17	24	320	97	66	6	57	7	7	20	984	1	3	0	0	4
4:15 PM	49	295	7	25	321	82	48	12	45	11	5	29	929	0	3	0	0	3
4:30 PM	41	310	11	21	319	91	53	11	52	5	11	19	944	3	5	0	0	8
4:45 PM	52	288	14	28	331	110	46	8	66	8	12	29	992	1	4	0	0	5
5:00 PM	45	329	15	28	322	110	66	8	64	4	9	34	1,034	0	2	0	0	2
5:15 PM	49	330	9	21	339	117	54	13	53	3	10	32	1,030	0	2	0	0	2
5:30 PM	54	292	10	33	346	99	51	8	58	8	17	38	1,014	0	3	1	0	4
5:45 PM	67	270	18	19	329	106	51	6	63	6	10	27	972	0	3	0	0	3
VOLUMES	398	2,436	101	199	2,627	812	435	72	458	52	81	228	7,899	5	25	1	0	31
APPROACH %	14%	83%	3%	5%	72%	22%	45%	7%	47%	14%	22%	63%						
APP/DEPART	2,935	/	3,123	3,638	/	3,142	965	/	347	361	/	1,287	0					
BEGIN PEAK HR		4:45 PM																
VOLUMES	200	1,239	48	110	1,338	436	217	37	241	23	48	133	4,070					
APPROACH %	13%	83%	3%	6%	71%	23%	44%	7%	49%	11%	24%	65%						
PEAK HR FACTOR		0.956			0.985			0.897			0.810		0.984					
APP/DEPART	1,487	/	1,599	1,884	/	1,603	495	/	184	204	/	684	0					

10th

NORTH SIDE

AV Mall WEST SIDE EAST SIDE **AV Mall**

SOUTH SIDE

10th

	PEDESTRIAN + BIKE CROSSINGS					PEDESTRIAN CROSSINGS					BICYCLE CROSSINGS				
	N SIDE	S SIDE	E SIDE	W SIDE	TOTAL	N SIDE	S SIDE	E SIDE	W SIDE	TOTAL	NS	SS	ES	WS	TOTAL
AM 7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	1	0	0	1	0	1	0	0	1	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	3	0	1	4	0	3	0	1	4	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	0	4	0	1	5	0	4	0	1	5	0	0	0	0	0
PM 4:00 PM	0	1	2	1	4	0	1	2	0	3	0	0	0	1	1
4:15 PM	0	0	1	1	2	0	0	0	1	1	0	0	1	0	1
4:30 PM	0	5	2	0	7	0	5	2	0	7	0	0	0	0	0
4:45 PM	0	7	2	6	15	0	7	2	6	15	0	0	0	0	0
5:00 PM	0	3	3	1	7	0	3	3	0	6	0	0	0	1	1
5:15 PM	0	1	1	0	2	0	1	1	0	2	0	0	0	0	0
5:30 PM	0	3	2	0	5	0	3	1	0	4	0	0	1	0	1
5:45 PM	0	0	1	0	1	0	0	1	0	1	0	0	0	0	0
TOTAL	0	20	14	9	43	0	20	12	7	39	0	0	2	2	4

INTERSECTION TURNING MOVEMENT COUNTS

T816

PREPARED BY: AimTD LLC. tel: 714 253 7888 cs@aimtd.com

DATE:	LOCATION:	Palmdale	PROJECT #:	SC1565
Wed, Jan 24, 18	NORTH & SOUTH:	10th	LOCATION #:	11
	EAST & WEST:	SR-14 EB Ramp	CONTROL:	SIGNAL

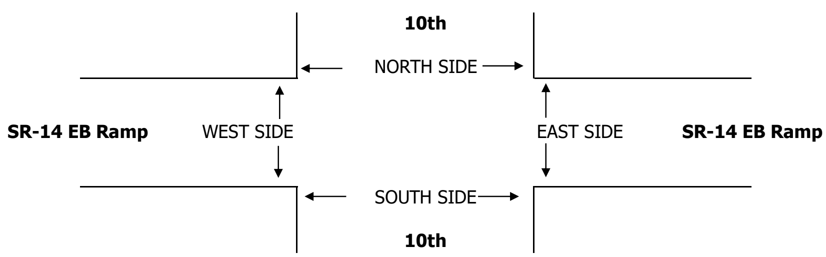
NOTES:

AM PM MD OTHER OTHER

▲ N ◄ W E ► S ▼

Add U-Turns to Left Turns

	NORTHBOUND 10th			SOUTHBOUND 10th			EASTBOUND SR-14 EB Ramp			WESTBOUND SR-14 EB Ramp				U-TURNS				
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL	NB	SB	EB	WB	TTL
LANES:	X	3	X	X	3	X	1	X	2	X	X	X		0	0	0	0	
AM 7:00 AM	0	145	0	0	47	0	12	0	115	0	0	0	319	0	0	0	0	0
7:15 AM	0	219	0	0	56	0	12	0	152	0	0	0	439	0	0	0	0	0
7:30 AM	0	256	0	0	68	0	17	0	163	0	0	0	504	0	0	0	0	0
7:45 AM	0	269	0	0	69	0	17	0	206	0	0	0	561	0	0	0	0	0
8:00 AM	0	219	0	0	75	0	24	0	160	0	0	0	478	0	0	0	0	0
8:15 AM	0	256	0	0	102	0	25	0	117	0	0	0	500	0	0	0	0	0
8:30 AM	0	195	0	1	87	0	25	0	139	0	0	0	447	0	1	0	0	1
8:45 AM	0	247	0	0	108	0	30	0	144	0	0	0	529	0	0	0	0	0
VOLUMES	0	1,806	0	1	612	0	162	0	1,196	0	0	0	3,777	0	1	0	0	1
APPROACH %	0%	100%	0%	0%	100%	0%	12%	0%	88%	0%	0%	0%						
APP/DEPART	1,806	/	1,969	613	/	1,808	1,358	/	0	0	/	0	0					
BEGIN PEAK HR		7:30 AM																
VOLUMES	0	1,000	0	0	314	0	83	0	646	0	0	0	2,043					
APPROACH %	0%	100%	0%	0%	100%	0%	11%	0%	89%	0%	0%	0%						
PEAK HR FACTOR		0.929			0.770			0.817			0.000		0.910					
APP/DEPART	1,000	/	1,083	314	/	960	729	/	0	0	/	0	0					
PM 4:00 PM	0	408	0	0	224	0	41	0	204	0	0	0	877	0	0	0	0	0
4:15 PM	0	380	0	0	188	0	33	0	239	0	0	0	840	0	0	0	0	0
4:30 PM	0	388	0	0	222	0	35	0	215	0	0	0	860	0	0	0	0	0
4:45 PM	0	365	0	0	197	0	38	0	270	0	0	0	870	0	0	0	0	0
5:00 PM	0	431	0	0	211	0	40	0	256	0	0	0	938	0	0	0	0	0
5:15 PM	0	414	0	0	216	0	36	0	251	0	0	0	917	0	0	0	0	0
5:30 PM	0	372	0	0	239	0	35	0	252	0	0	0	898	0	0	0	0	0
5:45 PM	0	344	0	0	210	0	39	0	231	0	0	0	824	0	0	0	0	0
VOLUMES	0	3,102	0	0	1,707	0	297	0	1,918	0	0	0	7,024	0	0	0	0	0
APPROACH %	0%	100%	0%	0%	100%	0%	13%	0%	87%	0%	0%	0%						
APP/DEPART	3,102	/	3,399	1,707	/	3,625	2,215	/	0	0	/	0	0					
BEGIN PEAK HR		4:45 PM																
VOLUMES	0	1,582	0	0	863	0	149	0	1,029	0	0	0	3,623					
APPROACH %	0%	100%	0%	0%	100%	0%	13%	0%	87%	0%	0%	0%						
PEAK HR FACTOR		0.918			0.903			0.956			0.000		0.966					
APP/DEPART	1,582	/	1,731	863	/	1,892	1,178	/	0	0	/	0	0					



	PEDESTRIAN + BIKE CROSSINGS					PEDESTRIAN CROSSINGS					BICYCLE CROSSINGS				
	N SIDE	S SIDE	E SIDE	W SIDE	TOTAL	N SIDE	S SIDE	E SIDE	W SIDE	TOTAL	NS	SS	ES	WS	TOTAL
AM 7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PM 4:00 PM	0	0	0	3	3	0	0	0	3	3	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	3	3	0	0	0	3	3	0	0	0	0	0
5:00 PM	0	0	0	3	3	0	0	0	3	3	0	0	0	0	0
5:15 PM	0	0	0	1	1	0	0	0	1	1	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	0	0	0	10	10	0	0	0	10	10	0	0	0	0	0

INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 cs@aimtd.com

T816

DATE:	LOCATION:	Palmdale	PROJECT #:	SC1565
Wed, Jan 24, 18	NORTH & SOUTH:	10th	LOCATION #:	12
	EAST & WEST:	Avenue O 8	CONTROL:	SIGNAL

NOTES:

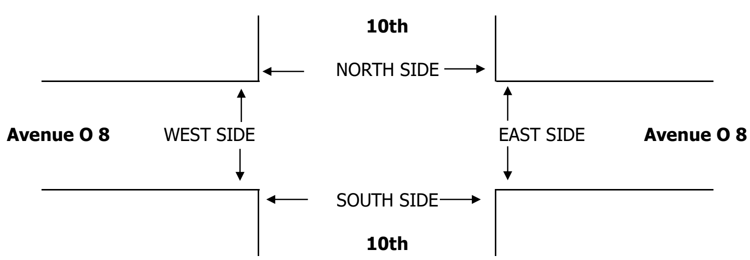
AM
PM
MD
OTHER
OTHER

▲ N
◄ W
E ►
S ▼

Add U-Turns to Left Turns

		NORTHBOUND 10th			SOUTHBOUND 10th			EASTBOUND Avenue O 8			WESTBOUND Avenue O 8			TOTAL
		NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	
	LANES:	2	2	1	2	2	1	2	2	1	2	2	1	
AM	7:00 AM	6	54	14	2	23	4	12	9	4	11	5	0	144
	7:15 AM	3	62	24	7	22	7	12	22	10	11	5	2	187
	7:30 AM	16	95	15	9	30	4	13	13	9	13	2	5	224
	7:45 AM	18	96	11	7	41	5	12	15	14	7	16	2	244
	8:00 AM	7	90	17	8	41	8	6	14	4	18	8	2	223
	8:15 AM	21	95	23	9	40	5	7	8	13	24	10	4	259
	8:30 AM	16	94	15	9	34	10	5	15	10	26	11	2	247
	8:45 AM	16	97	28	11	57	10	8	12	8	22	8	1	278
	VOLUMES	103	683	147	62	288	53	75	108	72	132	65	18	1,806
	APPROACH %	11%	73%	16%	15%	71%	13%	29%	42%	28%	61%	30%	8%	
	APP/DEPART	933	/	776	403	/	493	255	/	317	215	/	220	0
	BEGIN PEAK HR		8:00 AM											
	VOLUMES	60	376	83	37	172	33	26	49	35	90	37	9	1,007
	APPROACH %	12%	72%	16%	15%	71%	14%	24%	45%	32%	66%	27%	7%	
	PEAK HR FACTOR		0.920			0.776			0.917			0.872		0.906
	APP/DEPART	519	/	411	242	/	298	110	/	169	136	/	129	0
PM	4:00 PM	17	156	41	23	87	36	43	17	17	63	14	12	526
	4:15 PM	24	143	42	19	83	21	29	23	10	50	36	9	489
	4:30 PM	31	149	45	22	122	34	36	15	13	56	37	15	575
	4:45 PM	20	147	42	21	94	24	28	17	11	49	30	21	504
	5:00 PM	32	159	45	27	104	23	34	27	18	51	31	7	558
	5:15 PM	32	157	60	18	103	29	30	22	8	59	28	13	559
	5:30 PM	39	149	53	23	108	29	24	26	13	64	29	15	572
	5:45 PM	23	125	42	17	100	32	24	26	16	64	27	13	509
	VOLUMES	218	1,185	370	170	801	228	248	173	106	456	232	105	4,292
	APPROACH %	12%	67%	21%	14%	67%	19%	47%	33%	20%	58%	29%	13%	
	APP/DEPART	1,773	/	1,536	1,199	/	1,363	527	/	715	793	/	678	0
	BEGIN PEAK HR		5:00 PM											
	VOLUMES	126	590	200	85	415	113	112	101	55	238	115	48	2,198
	APPROACH %	14%	64%	22%	14%	68%	18%	42%	38%	21%	59%	29%	12%	
	PEAK HR FACTOR		0.920			0.958			0.848			0.928		0.961
	APP/DEPART	916	/	750	613	/	710	268	/	386	401	/	352	0

	U-TURNS				
	NB	SB	EB	WB	TTL
LANES	0	0	0	0	
7:00 AM	0	0	0	0	0
7:15 AM	0	0	0	0	0
7:30 AM	0	0	0	0	0
7:45 AM	0	0	0	0	0
8:00 AM	0	0	0	0	0
8:15 AM	1	0	0	0	1
8:30 AM	0	0	0	0	0
8:45 AM	0	0	0	0	0
VOLUMES	1	0	0	0	1
4:00 PM	0	0	1	2	3
4:15 PM	0	0	0	0	0
4:30 PM	0	0	0	0	0
4:45 PM	0	0	1	0	1
5:00 PM	1	0	0	0	1
5:15 PM	1	0	0	0	1
5:30 PM	0	0	0	0	0
5:45 PM	0	0	0	0	0
VOLUMES	2	0	2	2	6



		PEDESTRIAN + BIKE CROSSINGS					PEDESTRIAN CROSSINGS					BICYCLE CROSSINGS				
		N SIDE	S SIDE	E SIDE	W SIDE	TOTAL	N SIDE	S SIDE	E SIDE	W SIDE	TOTAL	NS	SS	ES	WS	TOTAL
AM	7:00 AM	0	0	1	0	1	0	0	1	0	1	0	0	0	0	0
	7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7:30 AM	0	0	1	0	1	0	0	1	0	1	0	0	0	0	0
	7:45 AM	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1
	8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:30 AM	0	0	1	0	1	0	0	1	0	1	0	0	0	0	0
	8:45 AM	1	0	0	1	2	1	0	0	1	2	0	0	0	0	0
	TOTAL	1	1	3	1	6	1	0	3	1	5	0	1	0	0	1
PM	4:00 PM	2	0	0	3	5	2	0	0	3	5	0	0	0	0	0
	4:15 PM	3	0	1	1	5	2	0	0	1	3	1	0	1	0	2
	4:30 PM	0	0	1	0	1	0	0	1	0	1	0	0	0	0	0
	4:45 PM	0	0	1	0	1	0	0	1	0	1	0	0	0	0	0
	5:00 PM	2	2	2	2	8	1	2	2	1	6	1	0	0	1	2
	5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:30 PM	1	0	0	1	2	0	0	0	1	1	1	0	0	0	1
	5:45 PM	0	0	1	0	1	0	0	0	0	0	0	0	1	0	1
	TOTAL	8	2	6	7	23	5	2	4	6	17	3	0	2	1	6

INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 cs@aimtd.com

DATE:	LOCATION:	Palmdale	PROJECT #:	SC1565
Wed, Jan 24, 18	NORTH & SOUTH:	20th	LOCATION #:	13
	EAST & WEST:	Avenue O 8	CONTROL:	STOP E/W

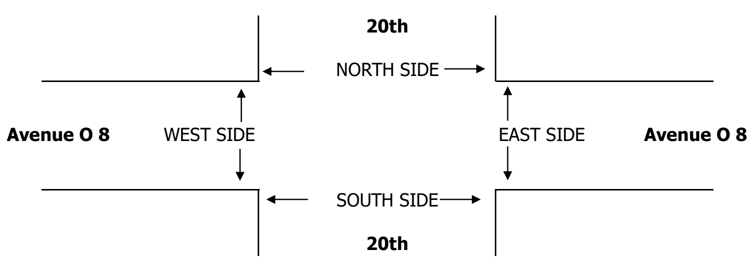
NOTES:

AM PM MD OTHER OTHER

▲ N ◄ W E ► S ▼

■ Add U-Turns to Left Turns

	NORTHBOUND 20th			SOUTHBOUND 20th			EASTBOUND Avenue O 8			WESTBOUND Avenue O 8				U-TURNS				
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL	NB	SB	EB	WB	TTL
LANES:	0	1	0	0	1	0	0	1	0	0	1	0		0	0	0	0	
AM 7:00 AM	0	48	6	6	70	1	0	1	1	9	0	6	148	0	0	0	0	0
7:15 AM	0	68	8	4	60	0	1	0	0	1	0	1	143	0	0	0	0	0
7:30 AM	0	83	7	8	24	1	0	1	0	2	0	9	135	0	0	0	0	0
7:45 AM	1	75	11	18	22	1	0	0	1	0	1	4	134	0	0	0	0	0
8:00 AM	0	44	6	19	29	0	0	0	0	4	0	6	108	0	0	0	0	0
8:15 AM	0	37	3	4	42	1	0	1	1	5	0	3	97	0	0	0	0	0
8:30 AM	0	23	10	13	26	0	0	0	0	7	0	9	88	0	0	0	0	0
8:45 AM	0	35	12	13	31	0	0	0	0	5	0	7	103	0	0	0	0	0
VOLUMES	1	413	63	85	304	4	1	3	3	33	1	45	956	0	0	0	0	0
APPROACH %	0%	87%	13%	22%	77%	1%	14%	43%	43%	42%	1%	57%						
APP/DEPART	477	/	459	393	/	340	7	/	151	79	/	6	0					
BEGIN PEAK HR		7:00 AM																
VOLUMES	1	274	32	36	176	3	1	2	2	12	1	20	560					
APPROACH %	0%	89%	10%	17%	82%	1%	20%	40%	40%	36%	3%	61%						
PEAK HR FACTOR		0.853			0.698			0.625			0.550		0.946					
APP/DEPART	307	/	295	215	/	190	5	/	70	33	/	5	0					
PM 4:00 PM	0	35	6	21	54	1	0	0	0	12	0	28	157	0	0	0	0	0
4:15 PM	0	39	6	22	49	1	0	0	1	21	0	32	171	0	0	0	0	0
4:30 PM	1	34	5	14	46	0	0	0	0	21	3	20	144	0	0	0	0	0
4:45 PM	0	42	7	26	71	0	1	2	0	18	1	30	198	0	0	0	0	0
5:00 PM	1	35	5	20	67	0	0	0	0	10	2	47	187	0	0	0	0	0
5:15 PM	0	43	6	26	60	1	0	1	0	24	2	32	195	0	0	0	0	0
5:30 PM	1	22	9	17	56	1	0	0	0	14	0	46	166	0	0	0	0	0
5:45 PM	1	43	10	25	67	0	1	1	1	9	1	28	187	0	0	0	0	0
VOLUMES	4	293	54	171	470	4	2	4	2	129	9	263	1,405	0	0	0	0	0
APPROACH %	1%	83%	15%	27%	73%	1%	25%	50%	25%	32%	2%	66%						
APP/DEPART	351	/	558	645	/	601	8	/	229	401	/	17	0					
BEGIN PEAK HR		4:45 PM																
VOLUMES	2	142	27	89	254	2	1	3	0	66	5	155	746					
APPROACH %	1%	83%	16%	26%	74%	1%	25%	75%	0%	29%	2%	69%						
PEAK HR FACTOR		0.872			0.889			0.333			0.942		0.942					
APP/DEPART	171	/	298	345	/	320	4	/	119	226	/	9	0					



	PEDESTRIAN + BIKE CROSSINGS					PEDESTRIAN CROSSINGS					BICYCLE CROSSINGS				
	N SIDE	S SIDE	E SIDE	W SIDE	TOTAL	N SIDE	S SIDE	E SIDE	W SIDE	TOTAL	NS	SS	ES	WS	TOTAL
AM 7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	1	0	1	0	0	1	0	1	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	0	0	1	0	1	0	0	1	0	1	0	0	0	0	0
PM 4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	4	0	0	4	0	0	0	0	0	0	4	0	0	4
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	0	4	0	0	4	0	0	0	0	0	0	4	0	0	4

APPENDIX B
EXISTING (2018) CONDITIONS PEAK HOUR INTERSECTION ANALYSIS WORKSHEETS

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	793	243	53	477	195	177	177	85	234	217	8
Future Volume (veh/h)	15	793	243	53	477	195	177	177	85	234	217	8
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		0.99	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	17	911	158	61	548	138	203	203	30	269	249	4
Adj No. of Lanes	1	2	1	1	3	1	2	2	1	2	2	0
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	37	1196	535	102	1903	585	326	446	198	398	524	8
Arrive On Green	0.02	0.34	0.34	0.06	0.37	0.37	0.09	0.13	0.13	0.12	0.15	0.15
Sat Flow, veh/h	1774	3539	1583	1774	5085	1563	3442	3539	1568	3442	3563	57
Grp Volume(v), veh/h	17	911	158	61	548	138	203	203	30	269	123	130
Grp Sat Flow(s),veh/h/ln	1774	1770	1583	1774	1695	1563	1721	1770	1568	1721	1770	1851
Q Serve(g_s), s	0.5	11.4	3.6	1.7	3.7	3.0	2.8	2.6	0.8	3.7	3.2	3.2
Cycle Q Clear(g_c), s	0.5	11.4	3.6	1.7	3.7	3.0	2.8	2.6	0.8	3.7	3.2	3.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.03
Lane Grp Cap(c), veh/h	37	1196	535	102	1903	585	326	446	198	398	260	272
V/C Ratio(X)	0.46	0.76	0.30	0.60	0.29	0.24	0.62	0.45	0.15	0.68	0.47	0.48
Avail Cap(c_a), veh/h	179	1463	655	179	2102	646	444	1356	601	521	717	750
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	24.0	14.6	12.1	22.8	10.9	10.7	21.6	20.1	19.3	21.0	19.4	19.4
Incr Delay (d2), s/veh	8.4	1.9	0.3	5.6	0.1	0.2	2.0	0.7	0.4	2.2	1.3	1.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	5.8	1.6	1.0	1.7	1.3	1.4	1.3	0.4	1.9	1.6	1.7
LnGrp Delay(d),s/veh	32.4	16.6	12.4	28.4	11.0	10.9	23.5	20.8	19.7	23.3	20.7	20.7
LnGrp LOS	C	B	B	C	B	B	C	C	B	C	C	C
Approach Vol, veh/h		1086			747			436			522	
Approach Delay, s/veh		16.2			12.4			22.0			22.0	
Approach LOS		B			B			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.2	10.8	7.3	21.3	9.2	11.8	5.5	23.1
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	7.5	19.0	5.0	20.5	6.4	20.1	5.0	20.5
Max Q Clear Time (g_c+I1), s	5.7	4.6	3.7	13.4	4.8	5.2	2.5	5.7
Green Ext Time (p_c), s	0.2	0.9	0.0	3.4	0.1	1.0	0.0	3.2

Intersection Summary	
HCM 2010 Ctrl Delay	17.2
HCM 2010 LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	995	148	255	427	22	306	3	293	3	22	5
Future Volume (veh/h)	4	995	148	255	427	22	306	3	293	3	22	5
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	5	1144	159	293	491	14	352	3	23	3	25	0
Adj No. of Lanes	2	2	0	2	2	1	2	1	0	1	2	1
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	23	1387	192	395	1955	923	495	26	199	54	108	59
Arrive On Green	0.01	0.44	0.44	0.11	0.55	0.55	0.14	0.14	0.14	0.03	0.03	0.00
Sat Flow, veh/h	3442	3123	433	3442	3539	1583	3548	186	1425	1774	3539	1583
Grp Volume(v), veh/h	5	647	656	293	491	14	352	0	26	3	25	0
Grp Sat Flow(s),veh/h/ln	1721	1770	1786	1721	1770	1583	1774	0	1611	1774	1770	1583
Q Serve(g_s), s	0.1	21.3	21.4	5.5	4.8	0.2	6.3	0.0	0.9	0.1	0.5	0.0
Cycle Q Clear(g_c), s	0.1	21.3	21.4	5.5	4.8	0.2	6.3	0.0	0.9	0.1	0.5	0.0
Prop In Lane	1.00		0.24	1.00		1.00	1.00		0.88	1.00		1.00
Lane Grp Cap(c), veh/h	23	786	793	395	1955	923	495	0	225	54	108	59
V/C Ratio(X)	0.22	0.82	0.83	0.74	0.25	0.02	0.71	0.00	0.12	0.06	0.23	0.00
Avail Cap(c_a), veh/h	259	957	966	487	2148	1009	999	0	454	481	959	440
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	32.8	16.2	16.2	28.4	7.7	5.8	27.3	0.0	25.0	31.3	31.4	0.0
Incr Delay (d2), s/veh	4.7	4.9	5.1	4.7	0.1	0.0	1.9	0.0	0.2	0.4	1.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	11.3	11.5	2.9	2.3	0.1	3.2	0.0	0.4	0.1	0.2	0.0
LnGrp Delay(d),s/veh	37.5	21.1	21.3	33.1	7.8	5.8	29.2	0.0	25.2	31.7	32.5	0.0
LnGrp LOS	D	C	C	C	A	A	C		C	C	C	
Approach Vol, veh/h		1308			798			378			28	
Approach Delay, s/veh		21.2			17.1			28.9			32.4	
Approach LOS		C			B			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		13.8	12.1	34.0		6.5	4.9	41.2
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		18.7	9.4	35.9		18.0	5.0	40.3
Max Q Clear Time (g_c+I1), s		8.3	7.5	23.4		2.5	2.1	6.8
Green Ext Time (p_c), s		1.0	0.2	6.1		0.1	0.0	3.0

Intersection Summary		
HCM 2010 Ctrl Delay		21.2
HCM 2010 LOS		C

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	164	1134	27	90	535	35	37	115	93	30	54	101
Future Volume (veh/h)	164	1134	27	90	535	35	37	115	93	30	54	101
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	171	1181	13	94	557	15	39	120	12	31	56	12
Adj No. of Lanes	1	2	1	1	2	1	1	1	1	1	1	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	221	1589	710	144	1435	641	320	246	209	271	246	209
Arrive On Green	0.12	0.45	0.45	0.08	0.41	0.41	0.13	0.13	0.13	0.13	0.13	0.13
Sat Flow, veh/h	1774	3539	1582	1774	3539	1581	1328	1863	1583	1253	1863	1583
Grp Volume(v), veh/h	171	1181	13	94	557	15	39	120	12	31	56	12
Grp Sat Flow(s),veh/h/ln	1774	1770	1582	1774	1770	1581	1328	1863	1583	1253	1863	1583
Q Serve(g_s), s	3.7	11.0	0.2	2.1	4.4	0.2	1.1	2.4	0.3	0.9	1.1	0.3
Cycle Q Clear(g_c), s	3.7	11.0	0.2	2.1	4.4	0.2	2.2	2.4	0.3	3.3	1.1	0.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	221	1589	710	144	1435	641	320	246	209	271	246	209
V/C Ratio(X)	0.77	0.74	0.02	0.65	0.39	0.02	0.12	0.49	0.06	0.11	0.23	0.06
Avail Cap(c_a), veh/h	395	1993	891	244	1692	756	759	862	733	685	862	733
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	16.9	9.1	6.1	17.8	8.4	7.1	16.5	16.1	15.2	17.6	15.5	15.2
Incr Delay (d2), s/veh	5.7	1.2	0.0	4.9	0.2	0.0	0.2	1.5	0.1	0.2	0.5	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.2	5.5	0.1	1.2	2.2	0.1	0.4	1.3	0.1	0.3	0.6	0.1
LnGrp Delay(d),s/veh	22.7	10.3	6.1	22.8	8.6	7.1	16.6	17.6	15.3	17.8	16.0	15.3
LnGrp LOS	C	B	A	C	A	A	B	B	B	B	B	B
Approach Vol, veh/h		1365			666			171			99	
Approach Delay, s/veh		11.8			10.5			17.2			16.5	
Approach LOS		B			B			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		9.8	7.7	22.4		9.8	9.5	20.7
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		18.5	5.5	22.5		18.5	8.9	19.1
Max Q Clear Time (g_c+I1), s		4.4	4.1	13.0		5.3	5.7	6.4
Green Ext Time (p_c), s		0.5	0.0	4.9		0.2	0.1	2.6

Intersection Summary	
HCM 2010 Ctrl Delay	12.0
HCM 2010 LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	36	1265	48	156	566	20	26	78	375	26	38	15
Future Volume (veh/h)	36	1265	48	156	566	20	26	78	375	26	38	15
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	41	1454	48	179	651	9	30	90	197	30	44	2
Adj No. of Lanes	1	3	0	1	2	1	1	2	0	1	2	0
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	79	1895	63	222	1611	721	410	341	301	247	665	30
Arrive On Green	0.04	0.37	0.37	0.13	0.46	0.46	0.19	0.19	0.19	0.19	0.19	0.19
Sat Flow, veh/h	1774	5057	167	1774	3539	1583	1352	1770	1560	1087	3449	156
Grp Volume(v), veh/h	41	975	527	179	651	9	30	90	197	30	22	24
Grp Sat Flow(s),veh/h/ln	1774	1695	1833	1774	1770	1583	1352	1770	1560	1087	1770	1835
Q Serve(g_s), s	1.0	11.1	11.1	4.3	5.4	0.1	0.8	1.9	5.1	1.2	0.5	0.5
Cycle Q Clear(g_c), s	1.0	11.1	11.1	4.3	5.4	0.1	1.3	1.9	5.1	6.3	0.5	0.5
Prop In Lane	1.00		0.09	1.00		1.00	1.00		1.00	1.00		0.08
Lane Grp Cap(c), veh/h	79	1271	687	222	1611	721	410	341	301	247	341	354
V/C Ratio(X)	0.52	0.77	0.77	0.81	0.40	0.01	0.07	0.26	0.66	0.12	0.07	0.07
Avail Cap(c_a), veh/h	222	1389	751	222	1611	721	704	725	639	482	725	752
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	20.5	12.1	12.1	18.7	8.0	6.6	15.0	15.1	16.4	19.3	14.5	14.5
Incr Delay (d2), s/veh	5.1	2.4	4.4	19.2	0.2	0.0	0.1	0.4	2.4	0.2	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	5.6	6.4	3.3	2.7	0.1	0.3	1.0	2.4	0.4	0.2	0.2
LnGrp Delay(d),s/veh	25.6	14.5	16.5	37.9	8.2	6.6	15.1	15.5	18.8	19.5	14.6	14.6
LnGrp LOS	C	B	B	D	A	A	B	B	B	B	B	B
Approach Vol, veh/h		1543			839			317			76	
Approach Delay, s/veh		15.5			14.5			17.5			16.5	
Approach LOS		B			B			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		13.0	10.0	21.0		13.0	6.5	24.5
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		18.0	5.5	18.0		18.0	5.5	18.0
Max Q Clear Time (g_c+I1), s		7.1	6.3	13.1		8.3	3.0	7.4
Green Ext Time (p_c), s		1.2	0.0	3.4		0.1	0.0	2.8

Intersection Summary	
HCM 2010 Ctrl Delay	15.4
HCM 2010 LOS	B

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	69	1601	723	24	18	23
Future Volume (veh/h)	69	1601	723	24	18	23
Number	7	4	8	18	1	16
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1900	1863	1863
Adj Flow Rate, veh/h	76	1759	795	23	20	0
Adj No. of Lanes	1	3	3	0	2	1
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	649	3257	3254	94	89	41
Arrive On Green	0.64	0.64	0.64	0.64	0.03	0.00
Sat Flow, veh/h	666	5253	5248	147	3442	1583
Grp Volume(v), veh/h	76	1759	530	288	20	0
Grp Sat Flow(s),veh/h/ln	666	1695	1695	1837	1721	1583
Q Serve(g_s), s	1.5	5.1	1.8	1.8	0.2	0.0
Cycle Q Clear(g_c), s	3.3	5.1	1.8	1.8	0.2	0.0
Prop In Lane	1.00			0.08	1.00	1.00
Lane Grp Cap(c), veh/h	649	3257	2171	1176	89	41
V/C Ratio(X)	0.12	0.54	0.24	0.24	0.23	0.00
Avail Cap(c_a), veh/h	778	4243	2829	1533	2361	1086
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	2.8	2.7	2.1	2.1	12.9	0.0
Incr Delay (d2), s/veh	0.1	0.1	0.1	0.1	1.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	2.3	0.8	0.9	0.1	0.0
LnGrp Delay(d),s/veh	2.8	2.8	2.1	2.2	14.1	0.0
LnGrp LOS	A	A	A	A	B	
Approach Vol, veh/h		1835	818		20	
Approach Delay, s/veh		2.8	2.1		14.1	
Approach LOS		A	A		B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs				4		6		8
Phs Duration (G+Y+Rc), s				21.8		5.2		21.8
Change Period (Y+Rc), s				4.5		4.5		4.5
Max Green Setting (Gmax), s				22.5		18.5		22.5
Max Q Clear Time (g_c+I1), s				7.1		2.2		3.8
Green Ext Time (p_c), s				10.1		0.0		4.3

Intersection Summary	
HCM 2010 Ctrl Delay	2.7
HCM 2010 LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	27	1586	3	15	712	41	12	1	12	22	0	20
Future Volume (veh/h)	27	1586	3	15	712	41	12	1	12	22	0	20
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1900	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	30	1762	3	17	791	26	13	1	0	24	0	10
Adj No. of Lanes	1	3	0	1	3	1	0	1	0	2	0	1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	496	2708	5	271	2558	796	34	3	0	145	0	64
Arrive On Green	0.03	0.52	0.52	0.02	0.50	0.50	0.02	0.02	0.00	0.04	0.00	0.04
Sat Flow, veh/h	1774	5242	9	1774	5085	1582	1653	127	0	3548	0	1579
Grp Volume(v), veh/h	30	1139	626	17	791	26	14	0	0	24	0	10
Grp Sat Flow(s),veh/h/ln	1774	1695	1861	1774	1695	1582	1780	0	0	1774	0	1579
Q Serve(g_s), s	0.4	11.0	11.0	0.2	4.1	0.4	0.3	0.0	0.0	0.3	0.0	0.3
Cycle Q Clear(g_c), s	0.4	11.0	11.0	0.2	4.1	0.4	0.3	0.0	0.0	0.3	0.0	0.3
Prop In Lane	1.00		0.00	1.00		1.00	0.93		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	496	1751	961	271	2558	796	36	0	0	145	0	64
V/C Ratio(X)	0.06	0.65	0.65	0.06	0.31	0.03	0.39	0.00	0.00	0.17	0.00	0.16
Avail Cap(c_a), veh/h	632	2319	1273	431	3479	1082	726	0	0	1423	0	633
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	5.1	7.9	7.9	6.4	6.6	5.6	21.7	0.0	0.0	20.8	0.0	20.8
Incr Delay (d2), s/veh	0.1	0.4	0.8	0.1	0.1	0.0	6.7	0.0	0.0	0.5	0.0	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	5.2	5.8	0.1	1.9	0.2	0.2	0.0	0.0	0.2	0.0	0.1
LnGrp Delay(d),s/veh	5.1	8.3	8.6	6.5	6.6	5.7	28.4	0.0	0.0	21.3	0.0	21.9
LnGrp LOS	A	A	A	A	A	A	C			C		C
Approach Vol, veh/h		1795			834			14			34	
Approach Delay, s/veh		8.4			6.6			28.4			21.5	
Approach LOS		A			A			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		5.4	5.5	27.7		6.3	6.1	27.1
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		18.3	5.0	30.7		18.0	5.0	30.7
Max Q Clear Time (g_c+I1), s		2.3	2.2	13.0		2.3	2.4	6.1
Green Ext Time (p_c), s		0.0	0.0	10.2		0.0	0.0	5.0

Intersection Summary	
HCM 2010 Ctrl Delay	8.1
HCM 2010 LOS	A

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	224	1036	371	60	525	240	179	396	36	349	398	73
Future Volume (veh/h)	224	1036	371	60	525	240	179	396	36	349	398	73
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	255	1177	308	68	597	208	203	450	2	397	452	34
Adj No. of Lanes	2	3	1	2	3	1	2	3	1	2	3	0
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	364	1573	634	201	1333	651	314	803	250	514	1044	78
Arrive On Green	0.11	0.31	0.31	0.06	0.26	0.26	0.09	0.16	0.16	0.15	0.22	0.22
Sat Flow, veh/h	3442	5085	1582	3442	5085	1582	3442	5085	1580	3442	4830	359
Grp Volume(v), veh/h	255	1177	308	68	597	208	203	450	2	397	316	170
Grp Sat Flow(s),veh/h/ln	1721	1695	1582	1721	1695	1582	1721	1695	1580	1721	1695	1799
Q Serve(g_s), s	4.0	11.5	8.0	1.1	5.4	4.9	3.2	4.5	0.1	6.1	4.5	4.5
Cycle Q Clear(g_c), s	4.0	11.5	8.0	1.1	5.4	4.9	3.2	4.5	0.1	6.1	4.5	4.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.20
Lane Grp Cap(c), veh/h	364	1573	634	201	1333	651	314	803	250	514	733	389
V/C Ratio(X)	0.70	0.75	0.49	0.34	0.45	0.32	0.65	0.56	0.01	0.77	0.43	0.44
Avail Cap(c_a), veh/h	379	1752	689	310	1651	750	453	1725	536	565	1260	668
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	23.9	17.2	12.4	25.1	17.1	11.1	24.3	21.6	19.7	22.7	18.8	18.8
Incr Delay (d2), s/veh	5.4	1.6	0.6	1.0	0.2	0.3	2.2	0.6	0.0	6.0	0.4	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.2	5.6	3.5	0.5	2.6	2.2	1.6	2.2	0.0	3.3	2.1	2.3
LnGrp Delay(d),s/veh	29.4	18.8	13.0	26.0	17.3	11.3	26.6	22.2	19.7	28.6	19.2	19.6
LnGrp LOS	C	B	B	C	B	B	C	C	B	C	B	B
Approach Vol, veh/h		1740			873			655			883	
Approach Delay, s/veh		19.3			16.6			23.5			23.5	
Approach LOS		B			B			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.8	13.3	7.7	21.6	9.6	16.5	10.4	19.0
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	9.1	18.8	5.0	19.1	7.3	20.6	6.1	18.0
Max Q Clear Time (g_c+I1), s	8.1	6.5	3.1	13.5	5.2	6.5	6.0	7.4
Green Ext Time (p_c), s	0.2	2.1	0.0	3.6	0.1	2.2	0.0	3.1

Intersection Summary	
HCM 2010 Ctrl Delay	20.3
HCM 2010 LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	16	1246	154	128	763	22	72	8	128	12	6	1
Future Volume (veh/h)	16	1246	154	128	763	22	72	8	128	12	6	1
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	18	1369	74	141	838	13	79	9	6	13	7	0
Adj No. of Lanes	1	3	1	1	3	1	1	1	1	1	2	0
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	41	2219	691	184	2630	819	324	174	148	320	331	0
Arrive On Green	0.02	0.44	0.44	0.10	0.52	0.52	0.09	0.09	0.09	0.09	0.09	0.00
Sat Flow, veh/h	1774	5085	1583	1774	5085	1583	1403	1863	1583	1393	3632	0
Grp Volume(v), veh/h	18	1369	74	141	838	13	79	9	6	13	7	0
Grp Sat Flow(s),veh/h/ln	1774	1695	1583	1774	1695	1583	1403	1863	1583	1393	1770	0
Q Serve(g_s), s	0.4	7.6	1.0	2.9	3.5	0.1	2.0	0.2	0.1	0.3	0.1	0.0
Cycle Q Clear(g_c), s	0.4	7.6	1.0	2.9	3.5	0.1	2.1	0.2	0.1	0.5	0.1	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	41	2219	691	184	2630	819	324	174	148	320	331	0
V/C Ratio(X)	0.44	0.62	0.11	0.77	0.32	0.02	0.24	0.05	0.04	0.04	0.02	0.00
Avail Cap(c_a), veh/h	241	2692	838	361	3037	946	936	986	838	927	1874	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	17.8	8.0	6.1	16.1	5.1	4.3	16.1	15.2	15.2	15.4	15.2	0.0
Incr Delay (d2), s/veh	7.5	0.3	0.1	6.5	0.1	0.0	0.4	0.1	0.1	0.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	3.6	0.4	1.7	1.6	0.1	0.8	0.1	0.1	0.1	0.0	0.0
LnGrp Delay(d),s/veh	25.2	8.3	6.2	22.6	5.2	4.3	16.5	15.3	15.3	15.5	15.2	0.0
LnGrp LOS	C	A	A	C	A	A	B	B	B	B	B	
Approach Vol, veh/h		1461			992			94			20	
Approach Delay, s/veh		8.4			7.7			16.3			15.4	
Approach LOS		A			A			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		7.9	8.3	20.6		7.9	5.3	23.6
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		19.5	7.5	19.5		19.5	5.0	22.0
Max Q Clear Time (g_c+I1), s		4.1	4.9	9.6		2.5	2.4	5.5
Green Ext Time (p_c), s		0.2	0.1	6.4		0.0	0.0	5.5

Intersection Summary	
HCM 2010 Ctrl Delay	8.5
HCM 2010 LOS	A

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	888	0	0	621	368	252
Future Volume (veh/h)	888	0	0	621	368	252
Number	4	14	3	8	5	12
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	0	0	1863	1863	1900
Adj Flow Rate, veh/h	925	0	0	647	306	312
Adj No. of Lanes	3	0	0	3	1	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	0	0	2	2	0
Cap, veh/h	1892	0	0	1892	533	485
Arrive On Green	0.37	0.00	0.00	0.37	0.30	0.30
Sat Flow, veh/h	5421	0	0	5421	1774	1615
Grp Volume(v), veh/h	925	0	0	647	306	312
Grp Sat Flow(s),veh/h/ln	1695	0	0	1695	1774	1615
Q Serve(g_s), s	3.8	0.0	0.0	2.5	4.0	4.6
Cycle Q Clear(g_c), s	3.8	0.0	0.0	2.5	4.0	4.6
Prop In Lane		0.00	0.00		1.00	1.00
Lane Grp Cap(c), veh/h	1892	0	0	1892	533	485
V/C Ratio(X)	0.49	0.00	0.00	0.34	0.57	0.64
Avail Cap(c_a), veh/h	3330	0	0	3330	1162	1057
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	6.6	0.0	0.0	6.2	8.1	8.3
Incr Delay (d2), s/veh	0.2	0.0	0.0	0.1	1.0	1.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.7	0.0	0.0	1.2	2.1	2.2
LnGrp Delay(d),s/veh	6.8	0.0	0.0	6.3	9.1	9.8
LnGrp LOS	A			A	A	A
Approach Vol, veh/h	925			647	618	
Approach Delay, s/veh	6.8			6.3	9.4	
Approach LOS	A			A	A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4				8
Phs Duration (G+Y+Rc), s		12.8		14.7				14.7
Change Period (Y+Rc), s		4.5		4.5				4.5
Max Green Setting (Gmax), s		18.0		18.0				18.0
Max Q Clear Time (g_c+I1), s		6.6		5.8				4.5
Green Ext Time (p_c), s		1.7		4.4				3.2

Intersection Summary	
HCM 2010 Ctrl Delay	7.4
HCM 2010 LOS	A

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	36	8	26	3	7	24	32	936	13	32	850	77
Future Volume (veh/h)	36	8	26	3	7	24	32	936	13	32	850	77
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	40	9	0	3	8	0	36	1040	13	36	944	38
Adj No. of Lanes	1	1	1	1	1	1	2	3	0	1	3	1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	100	105	90	26	27	23	146	1892	24	75	1858	579
Arrive On Green	0.06	0.06	0.00	0.01	0.01	0.00	0.04	0.37	0.37	0.04	0.37	0.37
Sat Flow, veh/h	1774	1863	1583	1774	1863	1583	3442	5177	65	1774	5085	1583
Grp Volume(v), veh/h	40	9	0	3	8	0	36	681	372	36	944	38
Grp Sat Flow(s),veh/h/ln	1774	1863	1583	1774	1863	1583	1721	1695	1851	1774	1695	1583
Q Serve(g_s), s	0.8	0.2	0.0	0.1	0.1	0.0	0.3	5.5	5.5	0.7	5.0	0.5
Cycle Q Clear(g_c), s	0.8	0.2	0.0	0.1	0.1	0.0	0.3	5.5	5.5	0.7	5.0	0.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.03	1.00		1.00
Lane Grp Cap(c), veh/h	100	105	90	26	27	23	146	1239	677	75	1858	579
V/C Ratio(X)	0.40	0.09	0.00	0.12	0.30	0.00	0.25	0.55	0.55	0.48	0.51	0.07
Avail Cap(c_a), veh/h	925	971	825	925	971	825	498	2052	1120	262	3092	963
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	15.7	15.4	0.0	16.8	16.8	0.0	16.0	8.7	8.7	16.2	8.5	7.1
Incr Delay (d2), s/veh	2.5	0.3	0.0	2.0	5.9	0.0	0.9	0.4	0.7	4.7	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.1	0.0	0.0	0.1	0.0	0.2	2.6	2.9	0.4	2.3	0.2
LnGrp Delay(d),s/veh	18.3	15.8	0.0	18.8	22.8	0.0	16.9	9.1	9.4	20.9	8.8	7.2
LnGrp LOS	B	B		B	C		B	A	A	C	A	A
Approach Vol, veh/h		49			11			1089			1018	
Approach Delay, s/veh		17.8			21.7			9.4			9.1	
Approach LOS		B			C			A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	6.0	17.1		6.5	6.0	17.1		5.0
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5
Max Green Setting (Gmax), s	5.1	20.9		18.0	5.0	21.0		18.0
Max Q Clear Time (g_c+I1), s	2.7	7.5		2.8	2.3	7.0		2.1
Green Ext Time (p_c), s	0.0	5.1		0.1	0.0	5.1		0.0

Intersection Summary		
HCM 2010 Ctrl Delay		9.5
HCM 2010 LOS		A

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	83	646	0	1000	314	0
Future Volume (veh/h)	83	646	0	1000	314	0
Number	7	14	5	2	6	16
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	0	1863	1863	0
Adj Flow Rate, veh/h	91	205	0	1099	345	0
Adj No. of Lanes	1	2	0	3	3	0
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	2	2	0	2	2	0
Cap, veh/h	314	494	0	2310	2310	0
Arrive On Green	0.18	0.18	0.00	0.45	0.45	0.00
Sat Flow, veh/h	1774	2787	0	5421	5421	0
Grp Volume(v), veh/h	91	205	0	1099	345	0
Grp Sat Flow(s),veh/h/ln	1774	1393	0	1695	1695	0
Q Serve(g_s), s	1.1	1.6	0.0	3.7	1.0	0.0
Cycle Q Clear(g_c), s	1.1	1.6	0.0	3.7	1.0	0.0
Prop In Lane	1.00	1.00	0.00			0.00
Lane Grp Cap(c), veh/h	314	494	0	2310	2310	0
V/C Ratio(X)	0.29	0.42	0.00	0.48	0.15	0.00
Avail Cap(c_a), veh/h	1308	2054	0	3748	3748	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	8.7	8.9	0.0	4.6	3.9	0.0
Incr Delay (d2), s/veh	0.5	0.6	0.0	0.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	0.6	0.0	1.7	0.5	0.0
LnGrp Delay(d),s/veh	9.2	9.5	0.0	4.8	3.9	0.0
LnGrp LOS	A	A		A	A	
Approach Vol, veh/h	296			1099	345	
Approach Delay, s/veh	9.4			4.8	3.9	
Approach LOS	A			A	A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		
Phs Duration (G+Y+Rc), s		15.6		8.8		15.6		
Change Period (Y+Rc), s		4.5		4.5		4.5		
Max Green Setting (Gmax), s		18.0		18.0		18.0		
Max Q Clear Time (g_c+I1), s		5.7		3.6		3.0		
Green Ext Time (p_c), s		5.4		0.9		1.7		

Intersection Summary			
HCM 2010 Ctrl Delay			5.4
HCM 2010 LOS			A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	26	49	35	90	37	9	60	376	83	37	172	33
Future Volume (veh/h)	26	49	35	90	37	9	60	376	83	37	172	33
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	29	54	6	99	41	1	66	413	27	41	189	9
Adj No. of Lanes	2	2	1	2	2	1	2	2	1	2	2	1
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	120	509	334	301	695	385	232	770	483	161	697	367
Arrive On Green	0.04	0.14	0.14	0.09	0.20	0.20	0.07	0.22	0.22	0.05	0.20	0.20
Sat Flow, veh/h	3442	3539	1580	3442	3539	1581	3442	3539	1581	3442	3539	1579
Grp Volume(v), veh/h	29	54	6	99	41	1	66	413	27	41	189	9
Grp Sat Flow(s),veh/h/ln	1721	1770	1580	1721	1770	1581	1721	1770	1581	1721	1770	1579
Q Serve(g_s), s	0.3	0.5	0.1	1.0	0.3	0.0	0.7	3.7	0.4	0.4	1.6	0.2
Cycle Q Clear(g_c), s	0.3	0.5	0.1	1.0	0.3	0.0	0.7	3.7	0.4	0.4	1.6	0.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	120	509	334	301	695	385	232	770	483	161	697	367
V/C Ratio(X)	0.24	0.11	0.02	0.33	0.06	0.00	0.29	0.54	0.06	0.25	0.27	0.02
Avail Cap(c_a), veh/h	482	1785	903	511	1815	885	482	1854	967	482	1854	883
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	16.8	13.3	11.1	15.3	11.7	10.2	15.8	12.4	8.8	16.4	12.2	10.6
Incr Delay (d2), s/veh	1.0	0.1	0.0	0.6	0.0	0.0	0.7	0.6	0.0	0.8	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.2	0.0	0.5	0.2	0.0	0.3	1.8	0.2	0.2	0.8	0.1
LnGrp Delay(d),s/veh	17.8	13.4	11.2	15.9	11.7	10.2	16.5	13.0	8.8	17.2	12.4	10.6
LnGrp LOS	B	B	B	B	B	B	B	B	A	B	B	B
Approach Vol, veh/h		89			141			506			239	
Approach Delay, s/veh		14.7			14.7			13.2			13.1	
Approach LOS		B			B			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.2	12.3	7.6	9.6	6.9	11.5	5.7	11.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	5.0	18.7	5.3	18.0	5.0	18.7	5.0	18.3
Max Q Clear Time (g_c+I1), s	2.4	5.7	3.0	2.5	2.7	3.6	2.3	2.3
Green Ext Time (p_c), s	0.0	2.0	0.0	0.2	0.0	0.8	0.0	0.1

Intersection Summary	
HCM 2010 Ctrl Delay	13.5
HCM 2010 LOS	B

Intersection	
Int Delay, s/veh	1.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	2	2	12	1	20	1	274	32	36	176	3
Future Vol, veh/h	1	2	2	12	1	20	1	274	32	36	176	3
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	2	2	13	1	21	1	288	34	38	185	3

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	581	587	187	572	571	305	188	0	0	322	0	0
Stage 1	263	263	-	307	307	-	-	-	-	-	-	-
Stage 2	318	324	-	265	264	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	425	422	855	431	431	735	1386	-	-	1238	-	-
Stage 1	742	691	-	703	661	-	-	-	-	-	-	-
Stage 2	693	650	-	740	690	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	401	407	855	417	416	735	1386	-	-	1238	-	-
Mov Cap-2 Maneuver	401	407	-	417	416	-	-	-	-	-	-	-
Stage 1	741	668	-	702	660	-	-	-	-	-	-	-
Stage 2	671	649	-	711	667	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	12.1	11.8	0	1.3
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1386	-	-	513	565	1238	-	-
HCM Lane V/C Ratio	0.001	-	-	0.01	0.061	0.031	-	-
HCM Control Delay (s)	7.6	0	-	12.1	11.8	8	0	-
HCM Lane LOS	A	A	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0	0.2	0.1	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	18	457	112	86	878	278	120	104	50	269	241	25
Future Volume (veh/h)	18	457	112	86	878	278	120	104	50	269	241	25
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.97	1.00		0.96	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	19	476	33	90	915	98	125	108	5	280	251	12
Adj No. of Lanes	1	2	1	1	3	1	2	2	1	2	2	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.87
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	42	877	382	133	1522	462	301	568	244	411	661	31
Arrive On Green	0.02	0.25	0.25	0.07	0.30	0.30	0.09	0.16	0.16	0.12	0.19	0.19
Sat Flow, veh/h	1774	3539	1540	1774	5085	1543	3442	3539	1519	3442	3435	163
Grp Volume(v), veh/h	19	476	33	90	915	98	125	108	5	280	129	134
Grp Sat Flow(s),veh/h/ln	1774	1770	1540	1774	1695	1543	1721	1770	1519	1721	1770	1829
Q Serve(g_s), s	0.5	5.3	0.7	2.2	7.0	2.2	1.6	1.2	0.1	3.5	2.9	2.9
Cycle Q Clear(g_c), s	0.5	5.3	0.7	2.2	7.0	2.2	1.6	1.2	0.1	3.5	2.9	2.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.09
Lane Grp Cap(c), veh/h	42	877	382	133	1522	462	301	568	244	411	341	352
V/C Ratio(X)	0.46	0.54	0.09	0.68	0.60	0.21	0.42	0.19	0.02	0.68	0.38	0.38
Avail Cap(c_a), veh/h	196	1406	612	196	2020	613	433	1406	603	456	715	739
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	21.8	14.8	13.1	20.4	13.6	11.9	19.6	16.5	16.0	19.1	15.9	15.9
Incr Delay (d2), s/veh	7.6	0.5	0.1	5.9	0.4	0.2	0.9	0.2	0.0	3.6	0.7	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	2.6	0.3	1.3	3.3	0.9	0.8	0.6	0.1	1.9	1.5	1.5
LnGrp Delay(d),s/veh	29.4	15.3	13.2	26.4	14.0	12.1	20.5	16.6	16.1	22.7	16.6	16.6
LnGrp LOS	C	B	B	C	B	B	C	B	B	C	B	B
Approach Vol, veh/h		528			1103			238			543	
Approach Delay, s/veh		15.7			14.8			18.6			19.8	
Approach LOS		B			B			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.9	11.8	7.9	15.7	8.5	13.2	5.6	18.1
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	6.0	18.0	5.0	18.0	5.7	18.3	5.0	18.0
Max Q Clear Time (g_c+I1), s	5.5	3.2	4.2	7.3	3.6	4.9	2.5	9.0
Green Ext Time (p_c), s	0.0	0.4	0.0	2.0	0.1	1.0	0.0	3.9

Intersection Summary	
HCM 2010 Ctrl Delay	16.5
HCM 2010 LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	702	94	175	1063	7	227	2	137	4	1	3
Future Volume (veh/h)	0	702	94	175	1063	7	227	2	137	4	1	3
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	0	739	88	184	1119	4	239	2	19	4	1	0
Adj No. of Lanes	2	2	0	2	2	1	2	1	0	1	2	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	8	1099	131	358	1963	888	430	19	176	12	24	0
Arrive On Green	0.00	0.34	0.34	0.10	0.55	0.55	0.12	0.12	0.12	0.01	0.01	0.00
Sat Flow, veh/h	3442	3186	379	3442	3539	1582	3548	153	1453	1774	3539	1583
Grp Volume(v), veh/h	0	410	417	184	1119	4	239	0	21	4	1	0
Grp Sat Flow(s),veh/h/ln	1721	1770	1795	1721	1770	1582	1774	0	1606	1774	1770	1583
Q Serve(g_s), s	0.0	8.4	8.4	2.2	8.8	0.0	2.7	0.0	0.5	0.1	0.0	0.3
Cycle Q Clear(g_c), s	0.0	8.4	8.4	2.2	8.8	0.0	2.7	0.0	0.5	0.1	0.0	0.3
Prop In Lane	1.00		0.21	1.00		1.00	1.00		0.90	1.00		1.00
Lane Grp Cap(c), veh/h	8	610	619	358	1963	888	430	0	195	12	24	-157
V/C Ratio(X)	0.00	0.67	0.67	0.51	0.57	0.00	0.56	0.00	0.11	0.33	0.04	0.00
Avail Cap(c_a), veh/h	404	1173	1190	590	2537	1144	1542	0	698	750	1497	502
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	11.9	11.9	18.0	6.2	4.1	17.6	0.0	16.6	21.0	21.0	0.0
Incr Delay (d2), s/veh	0.0	1.3	1.3	1.1	0.3	0.0	1.1	0.0	0.2	15.5	0.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	4.3	4.4	1.1	4.3	0.0	1.4	0.0	0.2	0.1	0.0	0.0
LnGrp Delay(d),s/veh	0.0	13.2	13.2	19.2	6.4	4.1	18.7	0.0	16.9	36.6	21.7	0.0
LnGrp LOS		B	B	B	A	A	B		B	D	C	
Approach Vol, veh/h		827			1307			260			5	
Approach Delay, s/veh		13.2			8.2			18.6			33.6	
Approach LOS		B			A			B			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		9.7	8.9	19.2		4.8	0.0	28.1
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		18.5	7.3	28.2		18.0	5.0	30.5
Max Q Clear Time (g_c+I1), s		4.7	4.2	10.4		2.3	0.0	10.8
Green Ext Time (p_c), s		0.7	0.2	4.2		0.0	0.0	7.0

Intersection Summary	
HCM 2010 Ctrl Delay	11.1
HCM 2010 LOS	B

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	76	715	24	74	1090	55	19	41	32	65	96	150
Future Volume (veh/h)	76	715	24	74	1090	55	19	41	32	65	96	150
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	80	753	11	78	1147	29	20	43	3	68	101	15
Adj No. of Lanes	1	2	1	1	2	1	1	1	1	1	1	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	132	1595	710	130	1591	708	287	244	206	333	244	206
Arrive On Green	0.07	0.45	0.45	0.07	0.45	0.45	0.13	0.13	0.13	0.13	0.13	0.13
Sat Flow, veh/h	1774	3539	1575	1774	3539	1575	1267	1863	1576	1349	1863	1576
Grp Volume(v), veh/h	80	753	11	78	1147	29	20	43	3	68	101	15
Grp Sat Flow(s),veh/h/ln	1774	1770	1575	1774	1770	1575	1267	1863	1576	1349	1863	1576
Q Serve(g_s), s	1.7	5.8	0.2	1.7	10.3	0.4	0.6	0.8	0.1	1.8	1.9	0.3
Cycle Q Clear(g_c), s	1.7	5.8	0.2	1.7	10.3	0.4	2.5	0.8	0.1	2.6	1.9	0.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	132	1595	710	130	1591	708	287	244	206	333	244	206
V/C Ratio(X)	0.61	0.47	0.02	0.60	0.72	0.04	0.07	0.18	0.01	0.20	0.41	0.07
Avail Cap(c_a), veh/h	227	1919	854	313	2091	930	717	877	742	791	877	742
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	17.5	7.5	5.9	17.6	8.8	6.0	16.8	15.1	14.8	16.3	15.6	14.9
Incr Delay (d2), s/veh	4.5	0.2	0.0	4.4	0.8	0.0	0.1	0.3	0.0	0.3	1.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	2.9	0.1	1.0	5.1	0.2	0.2	0.4	0.0	0.7	1.1	0.2
LnGrp Delay(d),s/veh	22.0	7.7	5.9	22.0	9.6	6.1	16.9	15.5	14.8	16.6	16.7	15.1
LnGrp LOS	C	A	A	C	A	A	B	B	B	B	B	B
Approach Vol, veh/h		844			1254			66			184	
Approach Delay, s/veh		9.0			10.3			15.9			16.5	
Approach LOS		A			B			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		9.6	7.4	22.1		9.6	7.4	22.1
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		18.4	6.9	21.2		18.4	5.0	23.1
Max Q Clear Time (g_c+I1), s		4.5	3.7	7.8		4.6	3.7	12.3
Green Ext Time (p_c), s		0.1	0.0	3.7		0.5	0.0	5.2

Intersection Summary		
HCM 2010 Ctrl Delay		10.5
HCM 2010 LOS		B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	85	743	26	167	1235	87	25	52	145	58	57	98
Future Volume (veh/h)	85	743	26	167	1235	87	25	52	145	58	57	98
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	86	751	21	169	1247	45	25	53	5	59	58	12
Adj No. of Lanes	1	3	0	1	2	1	1	2	0	1	2	0
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	137	2139	60	218	1651	738	312	384	36	318	345	69
Arrive On Green	0.08	0.42	0.42	0.12	0.47	0.47	0.12	0.12	0.12	0.12	0.12	0.12
Sat Flow, veh/h	1774	5086	142	1774	3539	1581	1322	3273	304	1337	2937	590
Grp Volume(v), veh/h	86	500	272	169	1247	45	25	28	30	59	34	36
Grp Sat Flow(s),veh/h/ln	1774	1695	1837	1774	1770	1581	1322	1770	1808	1337	1770	1757
Q Serve(g_s), s	1.9	4.0	4.0	3.7	11.6	0.6	0.7	0.6	0.6	1.7	0.7	0.7
Cycle Q Clear(g_c), s	1.9	4.0	4.0	3.7	11.6	0.6	1.4	0.6	0.6	2.2	0.7	0.7
Prop In Lane	1.00		0.08	1.00		1.00	1.00		0.17	1.00		0.34
Lane Grp Cap(c), veh/h	137	1426	773	218	1651	738	312	208	212	318	208	206
V/C Ratio(X)	0.63	0.35	0.35	0.77	0.76	0.06	0.08	0.14	0.14	0.19	0.16	0.17
Avail Cap(c_a), veh/h	223	1592	863	392	2000	894	788	844	863	799	844	838
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	17.8	7.8	7.8	16.9	8.7	5.8	16.5	15.8	15.8	16.8	15.8	15.8
Incr Delay (d2), s/veh	4.7	0.1	0.3	5.8	1.4	0.0	0.1	0.3	0.3	0.3	0.4	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	1.8	2.0	2.1	5.9	0.3	0.3	0.3	0.3	0.6	0.4	0.4
LnGrp Delay(d),s/veh	22.5	8.0	8.1	22.7	10.1	5.9	16.6	16.1	16.1	17.1	16.2	16.2
LnGrp LOS	C	A	A	C	B	A	B	B	B	B	B	B
Approach Vol, veh/h		858			1461			83			129	
Approach Delay, s/veh		9.5			11.4			16.2			16.6	
Approach LOS		A			B			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		9.2	9.4	21.2		9.2	7.6	23.1
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		19.0	8.8	18.7		19.0	5.0	22.5
Max Q Clear Time (g_c+I1), s		3.4	5.7	6.0		4.2	3.9	13.6
Green Ext Time (p_c), s		0.2	0.1	3.5		0.3	0.0	5.0

Intersection Summary	
HCM 2010 Ctrl Delay	11.2
HCM 2010 LOS	B

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	105	844	1330	104	98	159
Future Volume (veh/h)	105	844	1330	104	98	159
Number	7	4	8	18	1	16
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1900	1863	1863
Adj Flow Rate, veh/h	106	853	1343	94	99	121
Adj No. of Lanes	1	3	3	0	2	1
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	378	3152	3009	211	438	201
Arrive On Green	0.62	0.62	0.62	0.62	0.13	0.13
Sat Flow, veh/h	370	5253	5021	340	3442	1583
Grp Volume(v), veh/h	106	853	938	499	99	121
Grp Sat Flow(s),veh/h/ln	370	1695	1695	1803	1721	1583
Q Serve(g_s), s	7.5	2.7	5.2	5.2	0.9	2.6
Cycle Q Clear(g_c), s	12.7	2.7	5.2	5.2	0.9	2.6
Prop In Lane	1.00			0.19	1.00	1.00
Lane Grp Cap(c), veh/h	378	3152	2102	1118	438	201
V/C Ratio(X)	0.28	0.27	0.45	0.45	0.23	0.60
Avail Cap(c_a), veh/h	539	5358	3572	1899	1789	823
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	6.9	3.1	3.6	3.6	14.0	14.7
Incr Delay (d2), s/veh	0.4	0.0	0.1	0.3	0.3	2.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	1.3	2.4	2.6	0.4	1.3
LnGrp Delay(d),s/veh	7.3	3.1	3.7	3.8	14.2	17.5
LnGrp LOS	A	A	A	A	B	B
Approach Vol, veh/h		959	1437		220	
Approach Delay, s/veh		3.6	3.7		16.0	
Approach LOS		A	A		B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs				4		6		8
Phs Duration (G+Y+Rc), s				26.6		9.0		26.6
Change Period (Y+Rc), s				4.5		4.5		4.5
Max Green Setting (Gmax), s				37.5		18.5		37.5
Max Q Clear Time (g_c+I1), s				14.7		4.6		7.2
Green Ext Time (p_c), s				7.4		0.5		10.3

Intersection Summary	
HCM 2010 Ctrl Delay	4.7
HCM 2010 LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	42	892	5	66	1362	368	1	3	13	302	3	70
Future Volume (veh/h)	42	892	5	66	1362	368	1	3	13	302	3	70
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1900	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	42	901	4	67	1376	147	1	3	0	307	0	45
Adj No. of Lanes	1	3	0	1	3	1	0	1	0	2	0	1
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	297	1944	9	421	1982	615	6	18	0	529	0	235
Arrive On Green	0.05	0.37	0.37	0.06	0.39	0.39	0.01	0.01	0.00	0.15	0.00	0.15
Sat Flow, veh/h	1774	5225	23	1774	5085	1577	460	1380	0	3548	0	1574
Grp Volume(v), veh/h	42	585	320	67	1376	147	4	0	0	307	0	45
Grp Sat Flow(s),veh/h/ln	1774	1695	1858	1774	1695	1577	1840	0	0	1774	0	1574
Q Serve(g_s), s	0.6	5.8	5.8	1.0	10.1	2.8	0.1	0.0	0.0	3.6	0.0	1.1
Cycle Q Clear(g_c), s	0.6	5.8	5.8	1.0	10.1	2.8	0.1	0.0	0.0	3.6	0.0	1.1
Prop In Lane	1.00		0.01	1.00		1.00	0.25		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	297	1261	691	421	1982	615	24	0	0	529	0	235
V/C Ratio(X)	0.14	0.46	0.46	0.16	0.69	0.24	0.17	0.00	0.00	0.58	0.00	0.19
Avail Cap(c_a), veh/h	415	1548	848	511	2333	724	762	0	0	1429	0	634
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	8.9	10.6	10.6	7.8	11.4	9.2	21.8	0.0	0.0	17.7	0.0	16.7
Incr Delay (d2), s/veh	0.2	0.3	0.5	0.2	0.7	0.2	3.3	0.0	0.0	1.0	0.0	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	2.7	3.0	0.5	4.8	1.3	0.1	0.0	0.0	1.8	0.0	0.5
LnGrp Delay(d),s/veh	9.1	10.9	11.1	8.0	12.1	9.4	25.1	0.0	0.0	18.7	0.0	17.0
LnGrp LOS	A	B	B	A	B	A	C			B		B
Approach Vol, veh/h		947			1590			4			352	
Approach Delay, s/veh		10.9			11.7			25.1			18.5	
Approach LOS		B			B			C			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		5.1	7.3	21.1		11.2	6.5	21.9
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		18.5	5.1	20.4		18.0	5.0	20.5
Max Q Clear Time (g_c+I1), s		2.1	3.0	7.8		5.6	2.6	12.1
Green Ext Time (p_c), s		0.0	0.0	4.1		0.9	0.0	5.3

Intersection Summary	
HCM 2010 Ctrl Delay	12.3
HCM 2010 LOS	B

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	157	658	411	172	1035	569	579	758	76	501	915	153
Future Volume (veh/h)	157	658	411	172	1035	569	579	758	76	501	915	153
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.99	1.00		0.97	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	160	671	369	176	1056	529	591	773	20	511	934	124
Adj No. of Lanes	2	3	1	2	3	1	2	3	1	2	3	0
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	234	1245	688	234	1245	659	671	1365	414	599	1120	148
Arrive On Green	0.07	0.24	0.24	0.07	0.24	0.24	0.19	0.27	0.27	0.17	0.25	0.25
Sat Flow, veh/h	3442	5085	1548	3442	5085	1568	3442	5085	1541	3442	4527	599
Grp Volume(v), veh/h	160	671	369	176	1056	529	591	773	20	511	698	360
Grp Sat Flow(s),veh/h/ln	1721	1695	1548	1721	1695	1568	1721	1695	1541	1721	1695	1736
Q Serve(g_s), s	3.3	8.4	12.9	3.7	14.6	18.0	12.3	9.6	0.7	10.6	14.4	14.5
Cycle Q Clear(g_c), s	3.3	8.4	12.9	3.7	14.6	18.0	12.3	9.6	0.7	10.6	14.4	14.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.34
Lane Grp Cap(c), veh/h	234	1245	688	234	1245	659	671	1365	414	599	839	430
V/C Ratio(X)	0.68	0.54	0.54	0.75	0.85	0.80	0.88	0.57	0.05	0.85	0.83	0.84
Avail Cap(c_a), veh/h	234	1245	688	234	1245	659	679	1418	429	632	899	460
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.5	24.2	15.2	33.7	26.5	18.7	28.8	23.2	19.9	29.5	26.2	26.3
Incr Delay (d2), s/veh	7.9	0.5	0.8	12.8	5.7	7.1	12.8	0.5	0.0	10.5	6.4	12.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.8	4.0	5.6	2.2	7.4	10.7	7.0	4.6	0.3	5.9	7.4	8.3
LnGrp Delay(d),s/veh	41.4	24.6	16.0	46.5	32.2	25.8	41.5	23.7	20.0	40.0	32.6	38.4
LnGrp LOS	D	C	B	D	C	C	D	C	B	D	C	D
Approach Vol, veh/h		1200			1761			1384			1569	
Approach Delay, s/veh		24.2			31.7			31.3			36.3	
Approach LOS		C			C			C			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	17.3	24.2	9.5	22.5	18.8	22.7	9.5	22.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	13.5	20.5	5.0	18.0	14.5	19.5	5.0	18.0
Max Q Clear Time (g_c+I1), s	12.6	11.6	5.7	14.9	14.3	16.5	5.3	20.0
Green Ext Time (p_c), s	0.2	3.1	0.0	1.6	0.1	1.7	0.0	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	31.3
HCM 2010 LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	1013	170	289	1512	109	177	69	301	86	44	27
Future Volume (veh/h)	50	1013	170	289	1512	109	177	69	301	86	44	27
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.97	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	52	1055	56	301	1575	55	184	72	90	90	46	5
Adj No. of Lanes	1	3	1	1	3	1	1	1	1	1	2	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	92	1589	492	359	2353	714	408	380	318	359	657	70
Arrive On Green	0.05	0.31	0.31	0.20	0.46	0.46	0.20	0.20	0.20	0.20	0.20	0.20
Sat Flow, veh/h	1774	5085	1576	1774	5085	1542	1345	1863	1558	1216	3221	344
Grp Volume(v), veh/h	52	1055	56	301	1575	55	184	72	90	90	25	26
Grp Sat Flow(s),veh/h/ln	1774	1695	1576	1774	1695	1542	1345	1863	1558	1216	1770	1795
Q Serve(g_s), s	1.4	8.6	1.2	7.8	11.6	1.0	6.1	1.5	2.3	3.2	0.5	0.6
Cycle Q Clear(g_c), s	1.4	8.6	1.2	7.8	11.6	1.0	6.7	1.5	2.3	4.7	0.5	0.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.19
Lane Grp Cap(c), veh/h	92	1589	492	359	2353	714	408	380	318	359	361	366
V/C Ratio(X)	0.56	0.66	0.11	0.84	0.67	0.08	0.45	0.19	0.28	0.25	0.07	0.07
Avail Cap(c_a), veh/h	185	1906	591	388	2489	755	638	698	584	567	663	673
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	22.2	14.3	11.8	18.4	10.0	7.2	18.1	15.8	16.1	17.8	15.4	15.4
Incr Delay (d2), s/veh	5.3	0.7	0.1	14.1	0.7	0.0	0.8	0.2	0.5	0.4	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	4.1	0.5	5.2	5.4	0.4	2.3	0.8	1.0	1.1	0.3	0.3
LnGrp Delay(d),s/veh	27.5	15.0	11.9	32.5	10.7	7.2	18.9	16.1	16.6	18.1	15.5	15.5
LnGrp LOS	C	B	B	C	B	A	B	B	B	B	B	B
Approach Vol, veh/h		1163			1931			346			141	
Approach Delay, s/veh		15.4			14.0			17.7			17.2	
Approach LOS		B			B			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		14.3	14.2	19.5		14.3	7.0	26.7
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		18.0	10.5	18.0		18.0	5.0	23.5
Max Q Clear Time (g_c+I1), s		8.7	9.8	10.6		6.7	3.4	13.6
Green Ext Time (p_c), s		0.9	0.1	4.1		0.4	0.0	7.1

Intersection Summary	
HCM 2010 Ctrl Delay	14.9
HCM 2010 LOS	B

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	920	0	0	1235	880	150
Future Volume (veh/h)	920	0	0	1235	880	150
Number	4	14	3	8	5	12
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	0	0	1863	1863	1900
Adj Flow Rate, veh/h	958	0	0	1286	1036	0
Adj No. of Lanes	3	0	0	3	2	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	0	0	2	2	0
Cap, veh/h	1960	0	0	1960	1330	606
Arrive On Green	0.39	0.00	0.00	0.39	0.37	0.00
Sat Flow, veh/h	5421	0	0	5421	3548	1615
Grp Volume(v), veh/h	958	0	0	1286	1036	0
Grp Sat Flow(s),veh/h/ln	1695	0	0	1695	1774	1615
Q Serve(g_s), s	5.4	0.0	0.0	7.8	9.7	0.0
Cycle Q Clear(g_c), s	5.4	0.0	0.0	7.8	9.7	0.0
Prop In Lane		0.00	0.00		1.00	1.00
Lane Grp Cap(c), veh/h	1960	0	0	1960	1330	606
V/C Ratio(X)	0.49	0.00	0.00	0.66	0.78	0.00
Avail Cap(c_a), veh/h	2436	0	0	2436	1700	774
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	8.7	0.0	0.0	9.5	10.4	0.0
Incr Delay (d2), s/veh	0.2	0.0	0.0	0.5	1.8	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.5	0.0	0.0	3.7	4.9	0.0
LnGrp Delay(d),s/veh	8.9	0.0	0.0	9.9	12.2	0.0
LnGrp LOS	A			A	B	
Approach Vol, veh/h	958			1286	1036	
Approach Delay, s/veh	8.9			9.9	12.2	
Approach LOS	A			A	B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4				8
Phs Duration (G+Y+Rc), s		18.6		19.0				19.0
Change Period (Y+Rc), s		4.5		4.5				4.5
Max Green Setting (Gmax), s		18.0		18.0				18.0
Max Q Clear Time (g_c+I1), s		11.7		7.4				9.8
Green Ext Time (p_c), s		2.4		4.2				4.7

Intersection Summary		
HCM 2010 Ctrl Delay		10.4
HCM 2010 LOS		B

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	217	37	241	23	48	133	200	1239	48	110	1338	436
Future Volume (veh/h)	217	37	241	23	48	133	200	1239	48	110	1338	436
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.95	1.00		0.97	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	221	38	48	23	49	10	204	1264	44	112	1365	142
Adj No. of Lanes	1	1	1	1	1	1	2	3	0	1	3	1
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	321	337	279	114	120	97	308	1770	62	143	1742	532
Arrive On Green	0.18	0.18	0.18	0.06	0.06	0.06	0.09	0.35	0.35	0.08	0.34	0.34
Sat Flow, veh/h	1774	1863	1547	1774	1863	1509	3442	5040	175	1774	5085	1554
Grp Volume(v), veh/h	221	38	48	23	49	10	204	850	458	112	1365	142
Grp Sat Flow(s),veh/h/ln	1774	1863	1547	1774	1863	1509	1721	1695	1825	1774	1695	1554
Q Serve(g_s), s	6.5	1.0	1.5	0.7	1.4	0.3	3.2	12.1	12.1	3.5	13.4	3.7
Cycle Q Clear(g_c), s	6.5	1.0	1.5	0.7	1.4	0.3	3.2	12.1	12.1	3.5	13.4	3.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.10	1.00		1.00
Lane Grp Cap(c), veh/h	321	337	279	114	120	97	308	1191	641	143	1742	532
V/C Ratio(X)	0.69	0.11	0.17	0.20	0.41	0.10	0.66	0.71	0.71	0.78	0.78	0.27
Avail Cap(c_a), veh/h	573	602	499	573	602	487	327	1235	665	181	1889	577
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	21.4	19.1	19.3	24.7	25.0	24.6	24.6	15.7	15.7	25.1	16.5	13.3
Incr Delay (d2), s/veh	2.6	0.1	0.3	0.9	2.2	0.5	4.6	1.9	3.5	15.6	2.1	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.4	0.5	0.6	0.4	0.8	0.2	1.7	5.9	6.6	2.3	6.5	1.6
LnGrp Delay(d),s/veh	24.0	19.2	19.6	25.6	27.3	25.0	29.1	17.6	19.2	40.8	18.5	13.5
LnGrp LOS	C	B	B	C	C	C	C	B	B	D	B	B
Approach Vol, veh/h		307			82			1512			1619	
Approach Delay, s/veh		22.7			26.5			19.6			19.6	
Approach LOS		C			C			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	9.0	24.1		14.6	9.5	23.6		8.1
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5
Max Green Setting (Gmax), s	5.7	20.3		18.0	5.3	20.7		18.0
Max Q Clear Time (g_c+I1), s	5.5	14.1		8.5	5.2	15.4		3.4
Green Ext Time (p_c), s	0.0	3.7		0.7	0.0	3.6		0.2

Intersection Summary	
HCM 2010 Ctrl Delay	20.1
HCM 2010 LOS	C

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	149	1029	0	1582	863	0
Future Volume (veh/h)	149	1029	0	1582	863	0
Number	7	14	5	2	6	16
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	0	1863	1863	0
Adj Flow Rate, veh/h	154	1003	0	1631	890	0
Adj No. of Lanes	1	2	0	3	3	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	0	2	2	0
Cap, veh/h	709	1114	0	2006	2006	0
Arrive On Green	0.40	0.40	0.00	0.39	0.39	0.00
Sat Flow, veh/h	1774	2787	0	5421	5421	0
Grp Volume(v), veh/h	154	1003	0	1631	890	0
Grp Sat Flow(s),veh/h/ln	1774	1393	0	1695	1695	0
Q Serve(g_s), s	2.5	14.8	0.0	12.5	5.6	0.0
Cycle Q Clear(g_c), s	2.5	14.8	0.0	12.5	5.6	0.0
Prop In Lane	1.00	1.00	0.00			0.00
Lane Grp Cap(c), veh/h	709	1114	0	2006	2006	0
V/C Ratio(X)	0.22	0.90	0.00	0.81	0.44	0.00
Avail Cap(c_a), veh/h	731	1148	0	2094	2094	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	8.6	12.3	0.0	11.8	9.7	0.0
Incr Delay (d2), s/veh	0.2	9.7	0.0	2.5	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	7.1	0.0	6.2	2.6	0.0
LnGrp Delay(d),s/veh	8.8	22.0	0.0	14.3	9.9	0.0
LnGrp LOS	A	C		B	A	
Approach Vol, veh/h	1157			1631	890	
Approach Delay, s/veh	20.2			14.3	9.9	
Approach LOS	C			B	A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		
Phs Duration (G+Y+Rc), s		21.7		22.0		21.7		
Change Period (Y+Rc), s		4.5		4.5		4.5		
Max Green Setting (Gmax), s		18.0		18.0		18.0		
Max Q Clear Time (g_c+I1), s		14.5		16.8		7.6		
Green Ext Time (p_c), s		2.7		0.7		3.9		

Intersection Summary		
HCM 2010 Ctrl Delay		15.1
HCM 2010 LOS		B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	112	101	55	238	115	48	126	590	200	85	415	113
Future Volume (veh/h)	112	101	55	238	115	48	126	590	200	85	415	113
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		0.98	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	117	105	12	248	120	13	131	615	77	89	432	39
Adj No. of Lanes	2	2	1	2	2	1	2	2	1	2	2	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	302	439	341	382	522	350	317	950	594	262	893	528
Arrive On Green	0.09	0.12	0.12	0.11	0.15	0.15	0.09	0.27	0.27	0.08	0.25	0.25
Sat Flow, veh/h	3442	3539	1576	3442	3539	1553	3442	3539	1560	3442	3539	1543
Grp Volume(v), veh/h	117	105	12	248	120	13	131	615	77	89	432	39
Grp Sat Flow(s),veh/h/ln	1721	1770	1576	1721	1770	1553	1721	1770	1560	1721	1770	1543
Q Serve(g_s), s	1.4	1.1	0.3	3.0	1.3	0.3	1.5	6.6	1.4	1.1	4.5	0.7
Cycle Q Clear(g_c), s	1.4	1.1	0.3	3.0	1.3	0.3	1.5	6.6	1.4	1.1	4.5	0.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	302	439	341	382	522	350	317	950	594	262	893	528
V/C Ratio(X)	0.39	0.24	0.04	0.65	0.23	0.04	0.41	0.65	0.13	0.34	0.48	0.07
Avail Cap(c_a), veh/h	442	1487	808	458	1504	781	402	1512	842	402	1512	798
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	18.5	16.9	13.3	18.2	16.1	13.0	18.3	13.9	8.7	18.8	13.6	9.6
Incr Delay (d2), s/veh	0.8	0.3	0.0	2.4	0.2	0.0	0.9	0.7	0.1	0.8	0.4	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	0.6	0.1	1.5	0.6	0.1	0.8	3.3	0.6	0.5	2.2	0.3
LnGrp Delay(d),s/veh	19.3	17.2	13.3	20.6	16.3	13.1	19.2	14.6	8.8	19.5	14.0	9.6
LnGrp LOS	B	B	B	C	B	B	B	B	A	B	B	A
Approach Vol, veh/h		234			381			823			560	
Approach Delay, s/veh		18.0			19.0			14.8			14.6	
Approach LOS		B			B			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.8	16.0	9.3	9.8	8.4	15.3	8.3	10.8
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	5.0	18.3	5.7	18.0	5.0	18.3	5.5	18.2
Max Q Clear Time (g_c+I1), s	3.1	8.6	5.0	3.1	3.5	6.5	3.4	3.3
Green Ext Time (p_c), s	0.0	2.7	0.1	0.4	0.0	2.0	0.1	0.5

Intersection Summary	
HCM 2010 Ctrl Delay	15.9
HCM 2010 LOS	B

Intersection	
Int Delay, s/veh	5.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	3	0	66	5	155	2	142	27	89	254	2
Future Vol, veh/h	1	3	0	66	5	155	2	142	27	89	254	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	3	0	70	5	165	2	151	29	95	270	2

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	716	645	271	633	632	166	272	0	0	180	0	0
Stage 1	461	461	-	170	170	-	-	-	-	-	-	-
Stage 2	255	184	-	463	462	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	345	391	768	392	398	878	1291	-	-	1396	-	-
Stage 1	581	565	-	832	758	-	-	-	-	-	-	-
Stage 2	749	747	-	579	565	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	260	359	768	365	365	878	1291	-	-	1396	-	-
Mov Cap-2 Maneuver	260	359	-	365	365	-	-	-	-	-	-	-
Stage 1	580	520	-	830	756	-	-	-	-	-	-	-
Stage 2	603	746	-	529	520	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	16.1	14.7	0.1	2
HCM LOS	C	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1291	-	-	328	609	1396	-	-
HCM Lane V/C Ratio	0.002	-	-	0.013	0.395	0.068	-	-
HCM Control Delay (s)	7.8	0	-	16.1	14.7	7.8	0	-
HCM Lane LOS	A	A	-	C	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0	1.9	0.2	-	-

APPENDIX C

EXISTING (2018) WITH PROJECT CONDITIONS PEAK HOUR INTERSECTION ANALYSIS WORKSHEETS

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	803	243	53	509	195	177	177	85	234	217	8
Future Volume (veh/h)	15	803	243	53	509	195	177	177	85	234	217	8
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	17	923	71	61	585	65	203	203	4	269	249	4
Adj No. of Lanes	1	2	1	1	3	1	2	2	1	2	2	0
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	37	1203	538	102	1915	589	329	421	188	400	497	8
Arrive On Green	0.02	0.34	0.34	0.06	0.38	0.38	0.10	0.12	0.12	0.12	0.14	0.14
Sat Flow, veh/h	1774	3539	1583	1774	5085	1563	3442	3539	1583	3442	3563	57
Grp Volume(v), veh/h	17	923	71	61	585	65	203	203	4	269	123	130
Grp Sat Flow(s),veh/h/ln	1774	1770	1583	1774	1695	1563	1721	1770	1583	1721	1770	1851
Q Serve(g_s), s	0.5	11.4	1.5	1.6	4.0	1.3	2.8	2.6	0.1	3.7	3.2	3.2
Cycle Q Clear(g_c), s	0.5	11.4	1.5	1.6	4.0	1.3	2.8	2.6	0.1	3.7	3.2	3.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.03
Lane Grp Cap(c), veh/h	37	1203	538	102	1915	589	329	421	188	400	247	258
V/C Ratio(X)	0.45	0.77	0.13	0.60	0.31	0.11	0.62	0.48	0.02	0.67	0.50	0.50
Avail Cap(c_a), veh/h	181	1481	663	181	2128	654	450	1373	614	527	726	759
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	23.7	14.4	11.2	22.5	10.8	9.9	21.3	20.2	19.1	20.8	19.5	19.5
Incr Delay (d2), s/veh	8.4	2.0	0.1	5.5	0.1	0.1	1.9	0.9	0.0	2.1	1.6	1.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	5.8	0.7	1.0	1.9	0.6	1.4	1.3	0.1	1.8	1.7	1.7
LnGrp Delay(d),s/veh	32.1	16.4	11.3	28.0	10.9	10.0	23.2	21.0	19.1	22.9	21.1	21.0
LnGrp LOS	C	B	B	C	B	B	C	C	B	C	C	C
Approach Vol, veh/h		1011			711			410			522	
Approach Delay, s/veh		16.3			12.2			22.1			22.0	
Approach LOS		B			B			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.2	10.3	7.3	21.2	9.2	11.3	5.5	22.9
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	7.5	19.0	5.0	20.5	6.4	20.1	5.0	20.5
Max Q Clear Time (g_c+I1), s	5.7	4.6	3.6	13.4	4.8	5.2	2.5	6.0
Green Ext Time (p_c), s	0.2	0.9	0.0	3.2	0.1	1.0	0.0	3.1

Intersection Summary	
HCM 2010 Ctrl Delay	17.2
HCM 2010 LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	1005	148	255	459	22	306	3	293	3	22	5
Future Volume (veh/h)	4	1005	148	255	459	22	306	3	293	3	22	5
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	5	1155	159	293	528	14	352	3	23	3	25	0
Adj No. of Lanes	2	2	0	2	2	1	2	1	0	1	2	1
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	23	1397	192	395	1963	926	493	26	198	54	107	59
Arrive On Green	0.01	0.45	0.45	0.11	0.55	0.55	0.14	0.14	0.14	0.03	0.03	0.00
Sat Flow, veh/h	3442	3127	429	3442	3539	1583	3548	186	1425	1774	3539	1583
Grp Volume(v), veh/h	5	652	662	293	528	14	352	0	26	3	25	0
Grp Sat Flow(s),veh/h/ln	1721	1770	1787	1721	1770	1583	1774	0	1611	1774	1770	1583
Q Serve(g_s), s	0.1	21.6	21.8	5.5	5.2	0.2	6.3	0.0	0.9	0.1	0.5	0.0
Cycle Q Clear(g_c), s	0.1	21.6	21.8	5.5	5.2	0.2	6.3	0.0	0.9	0.1	0.5	0.0
Prop In Lane	1.00		0.24	1.00		1.00	1.00		0.88	1.00		1.00
Lane Grp Cap(c), veh/h	23	790	798	395	1963	926	493	0	224	54	107	59
V/C Ratio(X)	0.22	0.83	0.83	0.74	0.27	0.02	0.71	0.00	0.12	0.06	0.23	0.00
Avail Cap(c_a), veh/h	258	956	965	484	2145	1008	982	0	446	478	953	437
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	33.0	16.2	16.3	28.6	7.8	5.8	27.5	0.0	25.2	31.5	31.6	0.0
Incr Delay (d2), s/veh	4.7	5.1	5.2	4.8	0.1	0.0	1.9	0.0	0.2	0.4	1.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	11.6	11.8	2.9	2.5	0.1	3.2	0.0	0.4	0.1	0.2	0.0
LnGrp Delay(d),s/veh	37.7	21.3	21.5	33.4	7.9	5.8	29.4	0.0	25.4	31.9	32.7	0.0
LnGrp LOS	D	C	C	C	A	A	C		C	C	C	
Approach Vol, veh/h		1319			835			378			28	
Approach Delay, s/veh		21.4			16.8			29.1			32.6	
Approach LOS		C			B			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		13.8	12.2	34.3		6.5	4.9	41.6
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		18.5	9.4	36.1		18.0	5.0	40.5
Max Q Clear Time (g_c+I1), s		8.3	7.5	23.8		2.5	2.1	7.2
Green Ext Time (p_c), s		1.0	0.2	6.1		0.1	0.0	3.2

Intersection Summary	
HCM 2010 Ctrl Delay	21.2
HCM 2010 LOS	C

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	174	1134	27	98	559	40	37	123	93	127	62	109
Future Volume (veh/h)	174	1134	27	98	559	40	37	123	93	127	62	109
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	181	1181	13	102	582	17	39	128	14	132	65	16
Adj No. of Lanes	1	2	1	1	2	1	1	1	1	1	1	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	231	1483	663	140	1301	581	395	393	334	345	393	334
Arrive On Green	0.13	0.42	0.42	0.08	0.37	0.37	0.21	0.21	0.21	0.21	0.21	0.21
Sat Flow, veh/h	1774	3539	1583	1774	3539	1581	1312	1863	1583	1241	1863	1583
Grp Volume(v), veh/h	181	1181	13	102	582	17	39	128	14	132	65	16
Grp Sat Flow(s),veh/h/ln	1774	1770	1583	1774	1770	1581	1312	1863	1583	1241	1863	1583
Q Serve(g_s), s	4.6	13.5	0.2	2.6	5.8	0.3	1.2	2.7	0.3	4.7	1.3	0.4
Cycle Q Clear(g_c), s	4.6	13.5	0.2	2.6	5.8	0.3	2.5	2.7	0.3	7.4	1.3	0.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	231	1483	663	140	1301	581	395	393	334	345	393	334
V/C Ratio(X)	0.78	0.80	0.02	0.73	0.45	0.03	0.10	0.33	0.04	0.38	0.17	0.05
Avail Cap(c_a), veh/h	352	1717	768	210	1435	641	641	743	632	578	743	632
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.5	11.7	7.9	20.9	11.1	9.4	16.0	15.5	14.6	18.6	15.0	14.6
Incr Delay (d2), s/veh	6.3	2.4	0.0	7.1	0.2	0.0	0.1	0.5	0.1	0.7	0.2	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.6	7.0	0.1	1.5	2.8	0.1	0.4	1.4	0.1	1.6	0.7	0.2
LnGrp Delay(d),s/veh	25.8	14.1	7.9	27.9	11.3	9.4	16.1	16.0	14.6	19.3	15.2	14.6
LnGrp LOS	C	B	A	C	B	A	B	B	B	B	B	B
Approach Vol, veh/h		1375			701			181			213	
Approach Delay, s/veh		15.6			13.7			15.9			17.7	
Approach LOS		B			B			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		14.3	8.2	23.9		14.3	10.5	21.5
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		18.5	5.5	22.5		18.5	9.2	18.8
Max Q Clear Time (g_c+I1), s		4.7	4.6	15.5		9.4	6.6	7.8
Green Ext Time (p_c), s		0.6	0.0	3.9		0.5	0.1	2.5

Intersection Summary		
HCM 2010 Ctrl Delay		15.3
HCM 2010 LOS		B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	36	1362	48	156	589	20	26	78	375	26	38	15
Future Volume (veh/h)	36	1362	48	156	589	20	26	78	375	26	38	15
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	41	1566	49	179	677	12	30	90	230	30	44	1
Adj No. of Lanes	1	3	0	1	2	1	1	2	0	1	2	0
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	76	2052	64	227	1734	776	405	365	322	212	729	17
Arrive On Green	0.04	0.41	0.41	0.13	0.49	0.49	0.21	0.21	0.21	0.21	0.21	0.21
Sat Flow, veh/h	1774	5066	159	1774	3539	1583	1356	1770	1560	1055	3538	80
Grp Volume(v), veh/h	41	1048	567	179	677	12	30	90	230	30	22	23
Grp Sat Flow(s),veh/h/ln	1774	1695	1835	1774	1770	1583	1356	1770	1560	1055	1770	1849
Q Serve(g_s), s	1.2	13.8	13.8	5.1	6.2	0.2	0.9	2.2	7.1	1.4	0.5	0.5
Cycle Q Clear(g_c), s	1.2	13.8	13.8	5.1	6.2	0.2	1.5	2.2	7.1	8.5	0.5	0.5
Prop In Lane	1.00		0.09	1.00		1.00	1.00		1.00	1.00		0.04
Lane Grp Cap(c), veh/h	76	1373	743	227	1734	776	405	365	322	212	365	381
V/C Ratio(X)	0.54	0.76	0.76	0.79	0.39	0.02	0.07	0.25	0.72	0.14	0.06	0.06
Avail Cap(c_a), veh/h	199	1540	833	326	1861	832	610	633	558	372	633	661
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	24.3	13.3	13.3	21.9	8.3	6.8	17.1	17.2	19.1	23.1	16.5	16.5
Incr Delay (d2), s/veh	5.8	2.1	3.8	8.0	0.1	0.0	0.1	0.3	3.0	0.3	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	6.8	7.7	3.0	3.0	0.1	0.4	1.1	3.3	0.4	0.3	0.3
LnGrp Delay(d),s/veh	30.0	15.3	17.0	29.9	8.5	6.8	17.2	17.5	22.1	23.4	16.6	16.6
LnGrp LOS	C	B	B	C	A	A	B	B	C	C	B	B
Approach Vol, veh/h		1656			868			350			75	
Approach Delay, s/veh		16.3			12.9			20.5			19.3	
Approach LOS		B			B			C			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		15.2	11.1	25.5		15.2	6.7	29.9
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		18.5	9.5	23.5		18.5	5.8	27.2
Max Q Clear Time (g_c+I1), s		9.1	7.1	15.8		10.5	3.2	8.2
Green Ext Time (p_c), s		1.2	0.1	5.2		0.1	0.0	3.8

Intersection Summary		
HCM 2010 Ctrl Delay		15.8
HCM 2010 LOS		B

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	69	1698	746	24	18	23
Future Volume (veh/h)	69	1698	746	24	18	23
Number	7	4	8	18	1	16
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1900	1863	1863
Adj Flow Rate, veh/h	76	1866	820	23	20	0
Adj No. of Lanes	1	3	3	0	2	1
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	638	3306	3306	93	89	41
Arrive On Green	0.65	0.65	0.65	0.65	0.03	0.00
Sat Flow, veh/h	650	5253	5253	142	3442	1583
Grp Volume(v), veh/h	76	1866	546	297	20	0
Grp Sat Flow(s),veh/h/ln	650	1695	1695	1838	1721	1583
Q Serve(g_s), s	1.5	5.6	1.9	1.9	0.2	0.0
Cycle Q Clear(g_c), s	3.4	5.6	1.9	1.9	0.2	0.0
Prop In Lane	1.00			0.08	1.00	1.00
Lane Grp Cap(c), veh/h	638	3306	2204	1195	89	41
V/C Ratio(X)	0.12	0.56	0.25	0.25	0.23	0.00
Avail Cap(c_a), veh/h	743	4122	2748	1489	2294	1055
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	2.7	2.7	2.0	2.0	13.3	0.0
Incr Delay (d2), s/veh	0.1	0.2	0.1	0.1	1.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	2.5	0.9	0.9	0.1	0.0
LnGrp Delay(d),s/veh	2.8	2.8	2.1	2.1	14.5	0.0
LnGrp LOS	A	A	A	A	B	
Approach Vol, veh/h		1942	843		20	
Approach Delay, s/veh		2.8	2.1		14.5	
Approach LOS		A	A		B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs				4		6		8
Phs Duration (G+Y+Rc), s				22.5		5.2		22.5
Change Period (Y+Rc), s				4.5		4.5		4.5
Max Green Setting (Gmax), s				22.5		18.5		22.5
Max Q Clear Time (g_c+I1), s				7.6		2.2		3.9
Green Ext Time (p_c), s				10.4		0.0		4.5

Intersection Summary	
HCM 2010 Ctrl Delay	2.7
HCM 2010 LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	27	1683	3	15	735	41	12	1	12	22	0	20
Future Volume (veh/h)	27	1683	3	15	735	41	12	1	12	22	0	20
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1900	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	30	1870	3	17	817	26	13	1	0	24	0	10
Adj No. of Lanes	1	3	0	1	3	1	0	1	0	2	0	1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	492	2776	4	258	2625	816	33	3	0	144	0	64
Arrive On Green	0.03	0.53	0.53	0.02	0.52	0.52	0.02	0.02	0.00	0.04	0.00	0.04
Sat Flow, veh/h	1774	5243	8	1774	5085	1582	1653	127	0	3548	0	1579
Grp Volume(v), veh/h	30	1209	664	17	817	26	14	0	0	24	0	10
Grp Sat Flow(s),veh/h/ln	1774	1695	1861	1774	1695	1582	1780	0	0	1774	0	1579
Q Serve(g_s), s	0.4	12.1	12.1	0.2	4.3	0.4	0.4	0.0	0.0	0.3	0.0	0.3
Cycle Q Clear(g_c), s	0.4	12.1	12.1	0.2	4.3	0.4	0.4	0.0	0.0	0.3	0.0	0.3
Prop In Lane	1.00		0.00	1.00		1.00	0.93		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	492	1795	986	258	2625	816	36	0	0	144	0	64
V/C Ratio(X)	0.06	0.67	0.67	0.07	0.31	0.03	0.39	0.00	0.00	0.17	0.00	0.16
Avail Cap(c_a), veh/h	622	2254	1237	412	3381	1052	699	0	0	1379	0	613
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	5.0	8.0	8.0	6.5	6.5	5.5	22.4	0.0	0.0	21.5	0.0	21.5
Incr Delay (d2), s/veh	0.1	0.6	1.0	0.1	0.1	0.0	6.7	0.0	0.0	0.5	0.0	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	5.7	6.4	0.1	2.0	0.2	0.2	0.0	0.0	0.2	0.0	0.1
LnGrp Delay(d),s/veh	5.0	8.5	9.0	6.6	6.5	5.5	29.1	0.0	0.0	22.0	0.0	22.6
LnGrp LOS	A	A	A	A	A	A	C			C		C
Approach Vol, veh/h		1903			860			14			34	
Approach Delay, s/veh		8.6			6.5			29.1			22.2	
Approach LOS		A			A			C			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		5.4	5.5	29.0		6.4	6.1	28.4				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s		18.2	5.0	30.8		18.0	5.0	30.8				
Max Q Clear Time (g_c+I1), s		2.4	2.2	14.1		2.3	2.4	6.3				
Green Ext Time (p_c), s		0.0	0.0	10.4		0.0	0.0	5.2				
Intersection Summary												
HCM 2010 Ctrl Delay			8.3									
HCM 2010 LOS			A									
Notes												

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	256	1093	379	60	540	240	182	396	36	349	398	78
Future Volume (veh/h)	256	1093	379	60	540	240	182	396	36	349	398	78
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	291	1242	323	68	614	211	207	450	2	397	452	36
Adj No. of Lanes	2	3	1	2	3	1	2	3	1	2	3	0
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	400	1624	651	200	1329	648	317	788	245	510	1015	80
Arrive On Green	0.12	0.32	0.32	0.06	0.26	0.26	0.09	0.15	0.15	0.15	0.21	0.21
Sat Flow, veh/h	3442	5085	1583	3442	5085	1582	3442	5085	1583	3442	4807	379
Grp Volume(v), veh/h	291	1242	323	68	614	211	207	450	2	397	317	171
Grp Sat Flow(s),veh/h/ln	1721	1695	1583	1721	1695	1582	1721	1695	1583	1721	1695	1795
Q Serve(g_s), s	4.6	12.4	8.5	1.1	5.7	5.1	3.3	4.6	0.1	6.3	4.6	4.7
Cycle Q Clear(g_c), s	4.6	12.4	8.5	1.1	5.7	5.1	3.3	4.6	0.1	6.3	4.6	4.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.21
Lane Grp Cap(c), veh/h	400	1624	651	200	1329	648	317	788	245	510	716	379
V/C Ratio(X)	0.73	0.76	0.50	0.34	0.46	0.33	0.65	0.57	0.01	0.78	0.44	0.45
Avail Cap(c_a), veh/h	409	1778	699	305	1624	740	446	1661	517	544	1203	637
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	24.0	17.3	12.3	25.5	17.5	11.3	24.7	22.1	20.1	23.1	19.3	19.4
Incr Delay (d2), s/veh	6.3	1.9	0.6	1.0	0.3	0.3	2.3	0.7	0.0	6.7	0.4	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.5	6.0	3.8	0.5	2.7	2.2	1.7	2.2	0.0	3.5	2.2	2.4
LnGrp Delay(d),s/veh	30.3	19.1	12.9	26.5	17.7	11.6	27.0	22.7	20.2	29.8	19.8	20.2
LnGrp LOS	C	B	B	C	B	B	C	C	C	C	B	C
Approach Vol, veh/h		1856			893			659			885	
Approach Delay, s/veh		19.8			17.0			24.1			24.4	
Approach LOS		B			B			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.8	13.2	7.8	22.5	9.7	16.4	11.0	19.2
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	8.9	18.4	5.0	19.7	7.3	20.0	6.7	18.0
Max Q Clear Time (g_c+I1), s	8.3	6.6	3.1	14.4	5.3	6.7	6.6	7.7
Green Ext Time (p_c), s	0.1	2.0	0.0	3.6	0.1	2.2	0.0	3.1

Intersection Summary	
HCM 2010 Ctrl Delay	20.8
HCM 2010 LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	16	1303	154	128	778	22	72	8	128	12	6	1
Future Volume (veh/h)	16	1303	154	128	778	22	72	8	128	12	6	1
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	18	1432	77	141	855	13	79	9	6	13	7	0
Adj No. of Lanes	1	3	1	1	3	1	1	1	1	1	2	0
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	40	2288	712	182	2693	838	316	172	146	312	326	0
Arrive On Green	0.02	0.45	0.45	0.10	0.53	0.53	0.09	0.09	0.09	0.09	0.09	0.00
Sat Flow, veh/h	1774	5085	1583	1774	5085	1583	1403	1863	1583	1393	3632	0
Grp Volume(v), veh/h	18	1432	77	141	855	13	79	9	6	13	7	0
Grp Sat Flow(s),veh/h/ln	1774	1695	1583	1774	1695	1583	1403	1863	1583	1393	1770	0
Q Serve(g_s), s	0.4	8.2	1.1	2.9	3.6	0.1	2.1	0.2	0.1	0.3	0.1	0.0
Cycle Q Clear(g_c), s	0.4	8.2	1.1	2.9	3.6	0.1	2.1	0.2	0.1	0.5	0.1	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	40	2288	712	182	2693	838	316	172	146	312	326	0
V/C Ratio(X)	0.45	0.63	0.11	0.78	0.32	0.02	0.25	0.05	0.04	0.04	0.02	0.00
Avail Cap(c_a), veh/h	234	2746	855	350	3081	959	871	908	771	862	1724	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	18.3	8.0	6.0	16.6	5.1	4.2	16.6	15.7	15.7	15.9	15.7	0.0
Incr Delay (d2), s/veh	7.5	0.3	0.1	6.9	0.1	0.0	0.4	0.1	0.1	0.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	3.8	0.5	1.8	1.7	0.1	0.8	0.1	0.1	0.1	0.0	0.0
LnGrp Delay(d),s/veh	25.8	8.3	6.1	23.6	5.1	4.2	17.1	15.8	15.8	16.0	15.7	0.0
LnGrp LOS	C	A	A	C	A	A	B	B	B	B	B	
Approach Vol, veh/h		1527			1009			94			20	
Approach Delay, s/veh		8.4			7.7			16.9			15.9	
Approach LOS		A			A			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		8.0	8.4	21.6		8.0	5.4	24.6
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		18.5	7.5	20.5		18.5	5.0	23.0
Max Q Clear Time (g_c+I1), s		4.1	4.9	10.2		2.5	2.4	5.6
Green Ext Time (p_c), s		0.2	0.1	6.9		0.0	0.0	5.7

Intersection Summary	
HCM 2010 Ctrl Delay	8.5
HCM 2010 LOS	A

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	896	0	0	624	381	252
Future Volume (veh/h)	896	0	0	624	381	252
Number	4	14	3	8	5	12
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	0	0	1863	1863	1900
Adj Flow Rate, veh/h	933	0	0	650	313	319
Adj No. of Lanes	3	0	0	3	1	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	0	0	2	2	0
Cap, veh/h	1892	0	0	1892	540	491
Arrive On Green	0.37	0.00	0.00	0.37	0.30	0.30
Sat Flow, veh/h	5421	0	0	5421	1774	1615
Grp Volume(v), veh/h	933	0	0	650	313	319
Grp Sat Flow(s),veh/h/ln	1695	0	0	1695	1774	1615
Q Serve(g_s), s	3.9	0.0	0.0	2.6	4.1	4.8
Cycle Q Clear(g_c), s	3.9	0.0	0.0	2.6	4.1	4.8
Prop In Lane		0.00	0.00		1.00	1.00
Lane Grp Cap(c), veh/h	1892	0	0	1892	540	491
V/C Ratio(X)	0.49	0.00	0.00	0.34	0.58	0.65
Avail Cap(c_a), veh/h	3294	0	0	3294	1149	1046
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	6.7	0.0	0.0	6.3	8.2	8.4
Incr Delay (d2), s/veh	0.2	0.0	0.0	0.1	1.0	1.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.8	0.0	0.0	1.2	2.1	2.2
LnGrp Delay(d),s/veh	6.9	0.0	0.0	6.4	9.2	9.8
LnGrp LOS	A			A	A	A
Approach Vol, veh/h	933			650	632	
Approach Delay, s/veh	6.9			6.4	9.5	
Approach LOS	A			A	A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4				8
Phs Duration (G+Y+Rc), s		13.0		14.8				14.8
Change Period (Y+Rc), s		4.5		4.5				4.5
Max Green Setting (Gmax), s		18.0		18.0				18.0
Max Q Clear Time (g_c+I1), s		6.8		5.9				4.6
Green Ext Time (p_c), s		1.7		4.4				3.2

Intersection Summary		
HCM 2010 Ctrl Delay		7.5
HCM 2010 LOS		A

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	36	8	26	3	7	24	32	968	13	32	855	77
Future Volume (veh/h)	36	8	26	3	7	24	32	968	13	32	855	77
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	40	9	0	3	8	0	36	1076	13	36	950	38
Adj No. of Lanes	1	1	1	1	1	1	2	3	0	1	3	1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	100	105	89	26	27	23	145	1926	23	75	1891	589
Arrive On Green	0.06	0.06	0.00	0.01	0.01	0.00	0.04	0.37	0.37	0.04	0.37	0.37
Sat Flow, veh/h	1774	1863	1583	1774	1863	1583	3442	5179	63	1774	5085	1583
Grp Volume(v), veh/h	40	9	0	3	8	0	36	704	385	36	950	38
Grp Sat Flow(s),veh/h/ln	1774	1863	1583	1774	1863	1583	1721	1695	1852	1774	1695	1583
Q Serve(g_s), s	0.8	0.2	0.0	0.1	0.1	0.0	0.4	5.8	5.8	0.7	5.0	0.5
Cycle Q Clear(g_c), s	0.8	0.2	0.0	0.1	0.1	0.0	0.4	5.8	5.8	0.7	5.0	0.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.03	1.00		1.00
Lane Grp Cap(c), veh/h	100	105	89	26	27	23	145	1261	689	75	1891	589
V/C Ratio(X)	0.40	0.09	0.00	0.12	0.30	0.00	0.25	0.56	0.56	0.48	0.50	0.06
Avail Cap(c_a), veh/h	914	959	815	914	959	815	492	2027	1107	259	3055	951
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	15.9	15.6	0.0	17.0	17.0	0.0	16.2	8.7	8.7	16.4	8.5	7.1
Incr Delay (d2), s/veh	2.6	0.3	0.0	2.0	6.0	0.0	0.9	0.4	0.7	4.7	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.1	0.0	0.0	0.1	0.0	0.2	2.7	3.0	0.4	2.3	0.2
LnGrp Delay(d),s/veh	18.5	16.0	0.0	19.0	23.0	0.0	17.1	9.1	9.4	21.1	8.7	7.1
LnGrp LOS	B	B		B	C		B	A	A	C	A	A
Approach Vol, veh/h		49			11			1125			1024	
Approach Delay, s/veh		18.0			21.9			9.5			9.1	
Approach LOS		B			C			A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	6.0	17.5		6.5	6.0	17.5		5.0
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5
Max Green Setting (Gmax), s	5.1	20.9		18.0	5.0	21.0		18.0
Max Q Clear Time (g_c+I1), s	2.7	7.8		2.8	2.4	7.0		2.1
Green Ext Time (p_c), s	0.0	5.2		0.1	0.0	5.1		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	9.5
HCM 2010 LOS	A

Movement	EBL	EBR	NBL	NBT	SBT	SBR		
Lane Configurations								
Traffic Volume (veh/h)	86	651	0	1032	314	0		
Future Volume (veh/h)	86	651	0	1032	314	0		
Number	7	14	5	2	6	16		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	1863	1863	0	1863	1863	0		
Adj Flow Rate, veh/h	95	210	0	1134	345	0		
Adj No. of Lanes	1	2	0	3	3	0		
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91		
Percent Heavy Veh, %	2	2	0	2	2	0		
Cap, veh/h	314	493	0	2337	2337	0		
Arrive On Green	0.18	0.18	0.00	0.46	0.46	0.00		
Sat Flow, veh/h	1774	2787	0	5421	5421	0		
Grp Volume(v), veh/h	95	210	0	1134	345	0		
Grp Sat Flow(s),veh/h/ln	1774	1393	0	1695	1695	0		
Q Serve(g_s), s	1.2	1.7	0.0	3.8	1.0	0.0		
Cycle Q Clear(g_c), s	1.2	1.7	0.0	3.8	1.0	0.0		
Prop In Lane	1.00	1.00	0.00			0.00		
Lane Grp Cap(c), veh/h	314	493	0	2337	2337	0		
V/C Ratio(X)	0.30	0.43	0.00	0.49	0.15	0.00		
Avail Cap(c_a), veh/h	1289	2025	0	3695	3695	0		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00		
Uniform Delay (d), s/veh	8.9	9.1	0.0	4.7	3.9	0.0		
Incr Delay (d2), s/veh	0.5	0.6	0.0	0.2	0.0	0.0		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	0.6	0.7	0.0	1.7	0.5	0.0		
LnGrp Delay(d),s/veh	9.4	9.7	0.0	4.8	3.9	0.0		
LnGrp LOS	A	A		A	A			
Approach Vol, veh/h	305			1134	345			
Approach Delay, s/veh	9.6			4.8	3.9			
Approach LOS	A			A	A			
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		
Phs Duration (G+Y+Rc), s		15.9		8.9		15.9		
Change Period (Y+Rc), s		4.5		4.5		4.5		
Max Green Setting (Gmax), s		18.0		18.0		18.0		
Max Q Clear Time (g_c+I1), s		5.8		3.7		3.0		
Green Ext Time (p_c), s		5.5		0.9		1.7		
Intersection Summary								
HCM 2010 Ctrl Delay			5.5					
HCM 2010 LOS			A					

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	26	49	35	90	37	9	63	376	83	37	172	33
Future Volume (veh/h)	26	49	35	90	37	9	63	376	83	37	172	33
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	29	54	6	99	41	1	69	413	27	41	189	9
Adj No. of Lanes	2	2	1	2	2	1	2	2	1	2	2	1
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	121	503	335	302	690	382	239	771	483	161	690	364
Arrive On Green	0.04	0.14	0.14	0.09	0.19	0.19	0.07	0.22	0.22	0.05	0.20	0.20
Sat Flow, veh/h	3442	3539	1583	3442	3539	1581	3442	3539	1581	3442	3539	1579
Grp Volume(v), veh/h	29	54	6	99	41	1	69	413	27	41	189	9
Grp Sat Flow(s),veh/h/ln	1721	1770	1583	1721	1770	1581	1721	1770	1581	1721	1770	1579
Q Serve(g_s), s	0.3	0.5	0.1	1.0	0.3	0.0	0.7	3.7	0.4	0.4	1.6	0.2
Cycle Q Clear(g_c), s	0.3	0.5	0.1	1.0	0.3	0.0	0.7	3.7	0.4	0.4	1.6	0.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	121	503	335	302	690	382	239	771	483	161	690	364
V/C Ratio(X)	0.24	0.11	0.02	0.33	0.06	0.00	0.29	0.54	0.06	0.25	0.27	0.02
Avail Cap(c_a), veh/h	483	1789	910	512	1819	887	483	1859	969	483	1859	885
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	16.7	13.3	11.1	15.3	11.7	10.2	15.7	12.3	8.7	16.4	12.2	10.6
Incr Delay (d2), s/veh	1.0	0.1	0.0	0.6	0.0	0.0	0.7	0.6	0.0	0.8	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.2	0.0	0.5	0.2	0.0	0.3	1.8	0.2	0.2	0.8	0.1
LnGrp Delay(d),s/veh	17.7	13.4	11.1	15.9	11.7	10.2	16.4	12.9	8.8	17.2	12.4	10.6
LnGrp LOS	B	B	B	B	B	B	B	B	A	B	B	B
Approach Vol, veh/h		89			141			509			239	
Approach Delay, s/veh		14.7			14.6			13.2			13.2	
Approach LOS		B			B			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.2	12.3	7.6	9.6	7.0	11.4	5.7	11.4
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	5.0	18.7	5.3	18.0	5.0	18.7	5.0	18.3
Max Q Clear Time (g_c+I1), s	2.4	5.7	3.0	2.5	2.7	3.6	2.3	2.3
Green Ext Time (p_c), s	0.0	2.0	0.0	0.2	0.0	0.8	0.0	0.1

Intersection Summary			
HCM 2010 Ctrl Delay			13.5
HCM 2010 LOS			B

Intersection	
Int Delay, s/veh	1.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	2	2	17	1	20	1	274	32	36	176	3
Future Vol, veh/h	1	2	2	17	1	20	1	274	32	36	176	3
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	2	2	18	1	21	1	288	34	38	185	3

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	581	587	187	572	571	305	188	0	0	322	0	0
Stage 1	263	263	-	307	307	-	-	-	-	-	-	-
Stage 2	318	324	-	265	264	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	425	422	855	431	431	735	1386	-	-	1238	-	-
Stage 1	742	691	-	703	661	-	-	-	-	-	-	-
Stage 2	693	650	-	740	690	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	401	407	855	417	416	735	1386	-	-	1238	-	-
Mov Cap-2 Maneuver	401	407	-	417	416	-	-	-	-	-	-	-
Stage 1	741	668	-	702	660	-	-	-	-	-	-	-
Stage 2	671	649	-	711	667	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	12.1	12.2	0	1.3
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1386	-	-	513	540	1238	-	-
HCM Lane V/C Ratio	0.001	-	-	0.01	0.074	0.031	-	-
HCM Control Delay (s)	7.6	0	-	12.1	12.2	8	0	-
HCM Lane LOS	A	A	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0	0.2	0.1	-	-

Intersection												
Int Delay, s/veh	3.3											
Movement	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**
Lane Configurations												
Traffic Vol, veh/h	0	0	0	113	0	16	0	304	23	10	185	0
Future Vol, veh/h	0	0	0	113	0	16	0	304	23	10	185	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	0	-	-	0	-	-	50	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	123	0	17	0	330	25	11	201	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	574	578	201	566	566	343	201	0	0	355	0	0
Stage 1	223	223	-	343	343	-	-	-	-	-	-	-
Stage 2	351	355	-	223	223	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	430	427	840	435	434	700	1371	-	-	1204	-	-
Stage 1	780	719	-	672	637	-	-	-	-	-	-	-
Stage 2	666	630	-	780	719	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	416	423	840	432	430	700	1371	-	-	1204	-	-
Mov Cap-2 Maneuver	416	423	-	432	430	-	-	-	-	-	-	-
Stage 1	780	713	-	672	637	-	-	-	-	-	-	-
Stage 2	649	630	-	773	713	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	15.8	0	0.4
HCM LOS	A	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1371	-	-	-	432	700	1204	-	-
HCM Lane V/C Ratio	-	-	-	-	0.284	0.025	0.009	-	-
HCM Control Delay (s)	0	-	-	0	16.6	10.3	8	-	-
HCM Lane LOS	A	-	-	A	C	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	-	1.2	0.1	0	-	-

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	1354	612	18	0	32
Future Vol, veh/h	0	1354	612	18	0	32
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	1472	665	20	0	35

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	343
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.32
Pot Cap-1 Maneuver	0	-	-	-	0	653
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	-	653
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	10.8
HCM LOS			B

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	653
HCM Lane V/C Ratio	-	-	-	0.053
HCM Control Delay (s)	-	-	-	10.8
HCM Lane LOS	-	-	-	B
HCM 95th %tile Q(veh)	-	-	-	0.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	18	487	112	86	898	278	120	104	50	269	241	25
Future Volume (veh/h)	18	487	112	86	898	278	120	104	50	269	241	25
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.97	1.00		0.96	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	19	507	34	90	935	99	125	108	5	280	251	12
Adj No. of Lanes	1	2	1	1	3	1	2	2	1	2	2	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.87
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	42	887	386	132	1535	466	300	566	243	411	660	31
Arrive On Green	0.02	0.25	0.25	0.07	0.30	0.30	0.09	0.16	0.16	0.12	0.19	0.19
Sat Flow, veh/h	1774	3539	1541	1774	5085	1544	3442	3539	1519	3442	3435	163
Grp Volume(v), veh/h	19	507	34	90	935	99	125	108	5	280	129	134
Grp Sat Flow(s),veh/h/ln	1774	1770	1541	1774	1695	1544	1721	1770	1519	1721	1770	1829
Q Serve(g_s), s	0.5	5.7	0.8	2.3	7.2	2.2	1.6	1.2	0.1	3.6	2.9	2.9
Cycle Q Clear(g_c), s	0.5	5.7	0.8	2.3	7.2	2.2	1.6	1.2	0.1	3.6	2.9	2.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.09
Lane Grp Cap(c), veh/h	42	887	386	132	1535	466	300	566	243	411	340	351
V/C Ratio(X)	0.46	0.57	0.09	0.68	0.61	0.21	0.42	0.19	0.02	0.68	0.38	0.38
Avail Cap(c_a), veh/h	195	1399	609	195	2010	610	431	1399	600	454	711	735
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	21.9	14.9	13.1	20.5	13.6	11.9	19.7	16.6	16.1	19.2	16.0	16.0
Incr Delay (d2), s/veh	7.6	0.6	0.1	6.0	0.4	0.2	0.9	0.2	0.0	3.7	0.7	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	2.8	0.3	1.3	3.3	1.0	0.8	0.6	0.1	1.9	1.5	1.5
LnGrp Delay(d),s/veh	29.6	15.5	13.2	26.5	14.0	12.1	20.6	16.7	16.2	22.9	16.7	16.7
LnGrp LOS	C	B	B	C	B	B	C	B	B	C	B	B
Approach Vol, veh/h		560			1124			238			543	
Approach Delay, s/veh		15.8			14.8			18.8			19.9	
Approach LOS		B			B			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.9	11.8	7.9	15.9	8.5	13.2	5.6	18.2
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	6.0	18.0	5.0	18.0	5.7	18.3	5.0	18.0
Max Q Clear Time (g_c+I1), s	5.6	3.2	4.3	7.7	3.6	4.9	2.5	9.2
Green Ext Time (p_c), s	0.0	0.4	0.0	2.2	0.1	1.0	0.0	3.9

Intersection Summary	
HCM 2010 Ctrl Delay	16.5
HCM 2010 LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	732	94	175	1083	7	227	2	137	4	1	3
Future Volume (veh/h)	0	732	94	175	1083	7	227	2	137	4	1	3
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	0	771	88	184	1140	4	239	2	19	4	1	0
Adj No. of Lanes	2	2	0	2	2	1	2	1	0	1	2	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	8	1131	129	354	1983	897	428	18	175	12	24	0
Arrive On Green	0.00	0.35	0.35	0.10	0.56	0.56	0.12	0.12	0.12	0.01	0.01	0.00
Sat Flow, veh/h	3442	3202	365	3442	3539	1582	3548	153	1453	1774	3539	1583
Grp Volume(v), veh/h	0	426	433	184	1140	4	239	0	21	4	1	0
Grp Sat Flow(s),veh/h/ln	1721	1770	1798	1721	1770	1582	1774	0	1606	1774	1770	1583
Q Serve(g_s), s	0.0	8.9	8.9	2.2	9.0	0.0	2.7	0.0	0.5	0.1	0.0	0.3
Cycle Q Clear(g_c), s	0.0	8.9	8.9	2.2	9.0	0.0	2.7	0.0	0.5	0.1	0.0	0.3
Prop In Lane	1.00		0.20	1.00		1.00	1.00		0.90	1.00		1.00
Lane Grp Cap(c), veh/h	8	625	635	354	1983	897	428	0	194	12	24	-154
V/C Ratio(X)	0.00	0.68	0.68	0.52	0.57	0.00	0.56	0.00	0.11	0.33	0.04	0.00
Avail Cap(c_a), veh/h	398	1155	1173	581	2498	1127	1519	0	688	739	1474	495
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	11.9	11.9	18.4	6.2	4.1	17.9	0.0	16.9	21.4	21.3	0.0
Incr Delay (d2), s/veh	0.0	1.3	1.3	1.2	0.3	0.0	1.1	0.0	0.2	15.5	0.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	4.5	4.6	1.1	4.3	0.0	1.4	0.0	0.2	0.1	0.0	0.0
LnGrp Delay(d),s/veh	0.0	13.2	13.2	19.5	6.4	4.1	19.1	0.0	17.2	36.9	22.0	0.0
LnGrp LOS		B	B	B	A	A	B		B	D	C	
Approach Vol, veh/h		859			1328			260			5	
Approach Delay, s/veh		13.2			8.2			18.9			33.9	
Approach LOS		B			A			B			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		9.7	9.0	19.8		4.8	0.0	28.7
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		18.5	7.3	28.2		18.0	5.0	30.5
Max Q Clear Time (g_c+I1), s		4.7	4.2	10.9		2.3	0.0	11.0
Green Ext Time (p_c), s		0.7	0.2	4.3		0.0	0.0	7.1

Intersection Summary	
HCM 2010 Ctrl Delay	11.2
HCM 2010 LOS	B

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	106	715	24	79	1105	70	19	63	32	124	101	155
Future Volume (veh/h)	106	715	24	79	1105	70	19	63	32	124	101	155
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	112	753	11	83	1163	34	20	66	3	131	106	20
Adj No. of Lanes	1	2	1	1	2	1	1	1	1	1	1	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	151	1529	680	129	1485	661	338	348	295	372	348	295
Arrive On Green	0.08	0.43	0.43	0.07	0.42	0.42	0.19	0.19	0.19	0.19	0.19	0.19
Sat Flow, veh/h	1774	3539	1574	1774	3539	1574	1257	1863	1578	1323	1863	1578
Grp Volume(v), veh/h	112	753	11	83	1163	34	20	66	3	131	106	20
Grp Sat Flow(s),veh/h/ln	1774	1770	1574	1774	1770	1574	1257	1863	1578	1323	1863	1578
Q Serve(g_s), s	2.7	6.7	0.2	2.0	12.4	0.6	0.6	1.3	0.1	4.1	2.1	0.5
Cycle Q Clear(g_c), s	2.7	6.7	0.2	2.0	12.4	0.6	2.8	1.3	0.1	5.4	2.1	0.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	151	1529	680	129	1485	661	338	348	295	372	348	295
V/C Ratio(X)	0.74	0.49	0.02	0.64	0.78	0.05	0.06	0.19	0.01	0.35	0.30	0.07
Avail Cap(c_a), veh/h	223	1617	719	284	1738	773	662	830	703	714	830	703
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.6	9.0	7.1	19.8	11.0	7.5	16.5	15.0	14.5	17.3	15.3	14.7
Incr Delay (d2), s/veh	7.2	0.2	0.0	5.3	2.1	0.0	0.1	0.3	0.0	0.6	0.5	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.6	3.3	0.1	1.2	6.4	0.3	0.2	0.7	0.0	1.5	1.1	0.2
LnGrp Delay(d),s/veh	26.7	9.2	7.1	25.1	13.0	7.6	16.6	15.3	14.5	17.8	15.8	14.8
LnGrp LOS	C	A	A	C	B	A	B	B	B	B	B	B
Approach Vol, veh/h		876			1280			89			257	
Approach Delay, s/veh		11.4			13.7			15.5			16.8	
Approach LOS		B			B			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		12.7	7.7	23.4		12.7	8.2	22.9
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		19.5	7.0	20.0		19.5	5.5	21.5
Max Q Clear Time (g_c+I1), s		4.8	4.0	8.7		7.4	4.7	14.4
Green Ext Time (p_c), s		0.2	0.0	3.4		0.7	0.0	3.9

Intersection Summary	
HCM 2010 Ctrl Delay	13.3
HCM 2010 LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	85	802	26	167	1302	87	25	52	145	58	57	98
Future Volume (veh/h)	85	802	26	167	1302	87	25	52	145	58	57	98
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	86	810	22	169	1315	45	25	53	22	59	58	15
Adj No. of Lanes	1	3	0	1	2	1	1	2	0	1	2	0
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	132	2284	62	221	1765	789	291	283	111	290	320	80
Arrive On Green	0.07	0.45	0.45	0.12	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
Sat Flow, veh/h	1774	5090	138	1774	3539	1581	1319	2485	973	1316	2807	700
Grp Volume(v), veh/h	86	539	293	169	1315	45	25	37	38	59	36	37
Grp Sat Flow(s),veh/h/ln	1774	1695	1838	1774	1770	1581	1319	1770	1688	1316	1770	1737
Q Serve(g_s), s	2.0	4.5	4.5	4.0	12.8	0.6	0.8	0.8	0.9	1.8	0.8	0.8
Cycle Q Clear(g_c), s	2.0	4.5	4.5	4.0	12.8	0.6	1.6	0.8	0.9	2.7	0.8	0.8
Prop In Lane	1.00		0.08	1.00		1.00	1.00		0.58	1.00		0.40
Lane Grp Cap(c), veh/h	132	1521	825	221	1765	789	291	201	192	290	201	198
V/C Ratio(X)	0.65	0.35	0.36	0.76	0.74	0.06	0.09	0.18	0.20	0.20	0.18	0.19
Avail Cap(c_a), veh/h	226	1587	861	526	2256	1008	707	759	724	704	759	745
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.4	7.8	7.8	18.3	8.6	5.6	18.0	17.3	17.3	18.6	17.3	17.3
Incr Delay (d2), s/veh	5.3	0.1	0.3	5.4	1.0	0.0	0.1	0.4	0.5	0.3	0.4	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	2.1	2.3	2.3	6.3	0.3	0.3	0.4	0.4	0.7	0.4	0.4
LnGrp Delay(d),s/veh	24.7	7.9	8.1	23.7	9.6	5.6	18.2	17.7	17.8	18.9	17.7	17.8
LnGrp LOS	C	A	A	C	A	A	B	B	B	B	B	B
Approach Vol, veh/h		918			1529			100			132	
Approach Delay, s/veh		9.5			11.1			17.9			18.3	
Approach LOS		A			B			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		9.4	9.9	23.9		9.4	7.7	26.0
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		18.5	12.8	20.2		18.5	5.5	27.5
Max Q Clear Time (g_c+I1), s		3.6	6.0	6.5		4.7	4.0	14.8
Green Ext Time (p_c), s		0.3	0.2	3.9		0.3	0.0	6.7

Intersection Summary			
HCM 2010 Ctrl Delay			11.2
HCM 2010 LOS			B

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	105	903	1397	104	98	159
Future Volume (veh/h)	105	903	1397	104	98	159
Number	7	4	8	18	1	16
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1900	1863	1863
Adj Flow Rate, veh/h	106	912	1411	95	99	120
Adj No. of Lanes	1	3	3	0	2	1
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	359	3260	3121	210	428	197
Arrive On Green	0.64	0.64	0.64	0.64	0.12	0.12
Sat Flow, veh/h	346	5253	5035	328	3442	1583
Grp Volume(v), veh/h	106	912	983	523	99	120
Grp Sat Flow(s),veh/h/ln	346	1695	1695	1805	1721	1583
Q Serve(g_s), s	8.6	3.0	5.6	5.6	1.0	2.8
Cycle Q Clear(g_c), s	14.2	3.0	5.6	5.6	1.0	2.8
Prop In Lane	1.00			0.18	1.00	1.00
Lane Grp Cap(c), veh/h	359	3260	2174	1157	428	197
V/C Ratio(X)	0.30	0.28	0.45	0.45	0.23	0.61
Avail Cap(c_a), veh/h	520	5630	3753	1998	1659	763
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	7.1	3.0	3.5	3.5	15.2	15.9
Incr Delay (d2), s/veh	0.5	0.0	0.1	0.3	0.3	3.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	1.4	2.6	2.9	0.5	1.4
LnGrp Delay(d),s/veh	7.5	3.1	3.6	3.8	15.4	18.9
LnGrp LOS	A	A	A	A	B	B
Approach Vol, veh/h		1018	1506		219	
Approach Delay, s/veh		3.5	3.7		17.4	
Approach LOS		A	A		B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs				4		6		8
Phs Duration (G+Y+Rc), s				29.1		9.3		29.1
Change Period (Y+Rc), s				4.5		4.5		4.5
Max Green Setting (Gmax), s				42.5		18.5		42.5
Max Q Clear Time (g_c+I1), s				16.2		4.8		7.6
Green Ext Time (p_c), s				8.4		0.5		11.4

Intersection Summary		
HCM 2010 Ctrl Delay		4.7
HCM 2010 LOS		A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	42	951	5	66	1429	368	1	3	13	302	3	70
Future Volume (veh/h)	42	951	5	66	1429	368	1	3	13	302	3	70
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1900	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	42	961	4	67	1443	147	1	3	0	307	0	45
Adj No. of Lanes	1	3	0	1	3	1	0	1	0	2	0	1
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	289	1978	8	409	2014	625	6	18	0	526	0	234
Arrive On Green	0.05	0.38	0.38	0.06	0.40	0.40	0.01	0.01	0.00	0.15	0.00	0.15
Sat Flow, veh/h	1774	5227	22	1774	5085	1577	460	1380	0	3548	0	1574
Grp Volume(v), veh/h	42	623	342	67	1443	147	4	0	0	307	0	45
Grp Sat Flow(s),veh/h/ln	1774	1695	1858	1774	1695	1577	1840	0	0	1774	0	1574
Q Serve(g_s), s	0.6	6.3	6.3	1.0	10.8	2.8	0.1	0.0	0.0	3.7	0.0	1.1
Cycle Q Clear(g_c), s	0.6	6.3	6.3	1.0	10.8	2.8	0.1	0.0	0.0	3.7	0.0	1.1
Prop In Lane	1.00		0.01	1.00		1.00	0.25		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	289	1283	703	409	2014	625	24	0	0	526	0	234
V/C Ratio(X)	0.15	0.49	0.49	0.16	0.72	0.24	0.17	0.00	0.00	0.58	0.00	0.19
Avail Cap(c_a), veh/h	405	1527	837	497	2302	714	751	0	0	1410	0	625
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	9.0	10.7	10.7	7.8	11.5	9.1	22.1	0.0	0.0	18.0	0.0	16.9
Incr Delay (d2), s/veh	0.2	0.3	0.5	0.2	0.9	0.2	3.3	0.0	0.0	1.0	0.0	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	3.0	3.3	0.5	5.1	1.3	0.1	0.0	0.0	1.9	0.0	0.5
LnGrp Delay(d),s/veh	9.2	11.0	11.2	8.0	12.5	9.3	25.4	0.0	0.0	19.0	0.0	17.3
LnGrp LOS	A	B	B	A	B	A	C			B		B
Approach Vol, veh/h		1007			1657			4			352	
Approach Delay, s/veh		11.0			12.0			25.4			18.8	
Approach LOS		B			B			C			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		5.1	7.3	21.6		11.2	6.6	22.4
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		18.5	5.1	20.4		18.0	5.0	20.5
Max Q Clear Time (g_c+I1), s		2.1	3.0	8.3		5.7	2.6	12.8
Green Ext Time (p_c), s		0.0	0.0	4.3		0.9	0.0	5.1

Intersection Summary	
HCM 2010 Ctrl Delay	12.5
HCM 2010 LOS	B

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	177	692	416	172	1079	569	586	758	76	501	915	168
Future Volume (veh/h)	177	692	416	172	1079	569	586	758	76	501	915	168
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.99	1.00		0.97	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	181	706	377	176	1101	534	598	773	19	511	934	137
Adj No. of Lanes	2	3	1	2	3	1	2	3	1	2	3	0
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	244	1258	698	256	1276	674	685	1370	415	611	1106	162
Arrive On Green	0.07	0.25	0.25	0.07	0.25	0.25	0.20	0.27	0.27	0.18	0.25	0.25
Sat Flow, veh/h	3442	5085	1548	3442	5085	1568	3442	5085	1541	3442	4463	652
Grp Volume(v), veh/h	181	706	377	176	1101	534	598	773	19	511	709	362
Grp Sat Flow(s),veh/h/ln	1721	1695	1548	1721	1695	1568	1721	1695	1541	1721	1695	1725
Q Serve(g_s), s	4.0	9.4	13.9	3.9	16.1	19.5	13.1	10.2	0.7	11.1	15.5	15.6
Cycle Q Clear(g_c), s	4.0	9.4	13.9	3.9	16.1	19.5	13.1	10.2	0.7	11.1	15.5	15.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.38
Lane Grp Cap(c), veh/h	244	1258	698	256	1276	674	685	1370	415	611	840	427
V/C Ratio(X)	0.74	0.56	0.54	0.69	0.86	0.79	0.87	0.56	0.05	0.84	0.84	0.85
Avail Cap(c_a), veh/h	244	1258	698	283	1276	674	731	1370	415	731	894	455
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.4	25.6	15.8	35.1	27.8	19.3	30.2	24.5	21.0	30.9	27.8	27.8
Incr Delay (d2), s/veh	11.6	0.6	0.8	6.1	6.3	6.4	10.9	0.5	0.0	7.3	7.1	13.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.3	4.4	6.0	2.0	8.3	11.1	7.3	4.8	0.3	5.9	8.0	8.9
LnGrp Delay(d),s/veh	47.0	26.1	16.6	41.2	34.2	25.7	41.1	25.0	21.1	38.1	34.9	41.2
LnGrp LOS	D	C	B	D	C	C	D	C	C	D	C	D
Approach Vol, veh/h		1264			1811			1390			1582	
Approach Delay, s/veh		26.3			32.3			31.9			37.4	
Approach LOS		C			C			C			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	18.3	25.4	10.3	23.7	20.0	23.8	10.0	24.0
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	16.5	20.5	6.4	18.6	16.5	20.5	5.5	19.5
Max Q Clear Time (g_c+I1), s	13.1	12.2	5.9	15.9	15.1	17.6	6.0	21.5
Green Ext Time (p_c), s	0.7	3.0	0.0	1.5	0.4	1.7	0.0	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	32.3
HCM 2010 LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	1047	170	289	1556	109	177	69	301	86	44	27
Future Volume (veh/h)	50	1047	170	289	1556	109	177	69	301	86	44	27
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.97	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	52	1091	56	301	1621	55	184	72	91	90	46	5
Adj No. of Lanes	1	3	1	1	3	1	1	1	1	1	2	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	92	1607	498	358	2370	719	406	379	317	357	656	70
Arrive On Green	0.05	0.32	0.32	0.20	0.47	0.47	0.20	0.20	0.20	0.20	0.20	0.20
Sat Flow, veh/h	1774	5085	1576	1774	5085	1542	1345	1863	1558	1215	3221	344
Grp Volume(v), veh/h	52	1091	56	301	1621	55	184	72	91	90	25	26
Grp Sat Flow(s),veh/h/ln	1774	1695	1576	1774	1695	1542	1345	1863	1558	1215	1770	1795
Q Serve(g_s), s	1.4	9.1	1.2	7.9	12.1	1.0	6.2	1.6	2.4	3.2	0.6	0.6
Cycle Q Clear(g_c), s	1.4	9.1	1.2	7.9	12.1	1.0	6.8	1.6	2.4	4.8	0.6	0.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.19
Lane Grp Cap(c), veh/h	92	1607	498	358	2370	719	406	379	317	357	360	365
V/C Ratio(X)	0.56	0.68	0.11	0.84	0.68	0.08	0.45	0.19	0.29	0.25	0.07	0.07
Avail Cap(c_a), veh/h	183	1888	585	384	2465	747	632	692	578	561	657	667
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	22.4	14.4	11.8	18.6	10.1	7.2	18.3	16.0	16.3	18.0	15.6	15.6
Incr Delay (d2), s/veh	5.3	0.8	0.1	14.5	0.8	0.0	0.8	0.2	0.5	0.4	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	4.3	0.5	5.3	5.7	0.4	2.4	0.8	1.1	1.1	0.3	0.3
LnGrp Delay(d),s/veh	27.8	15.2	11.9	33.1	10.9	7.2	19.1	16.2	16.8	18.3	15.7	15.7
LnGrp LOS	C	B	B	C	B	A	B	B	B	B	B	B
Approach Vol, veh/h		1199			1977			347			141	
Approach Delay, s/veh		15.6			14.2			17.9			17.4	
Approach LOS		B			B			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		14.4	14.3	19.8		14.4	7.0	27.1
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		18.0	10.5	18.0		18.0	5.0	23.5
Max Q Clear Time (g_c+I1), s		8.8	9.9	11.1		6.8	3.4	14.1
Green Ext Time (p_c), s		0.9	0.1	4.1		0.4	0.0	7.0

Intersection Summary	
HCM 2010 Ctrl Delay	15.1
HCM 2010 LOS	B

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑			↑↑↑	↰↱	
Traffic Volume (veh/h)	925	0	0	1242	917	150
Future Volume (veh/h)	925	0	0	1242	917	150
Number	4	14	3	8	5	12
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	0	0	1863	1863	1900
Adj Flow Rate, veh/h	964	0	0	1294	1075	0
Adj No. of Lanes	3	0	0	3	2	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	0	0	2	2	0
Cap, veh/h	1947	0	0	1947	1355	617
Arrive On Green	0.38	0.00	0.00	0.38	0.38	0.00
Sat Flow, veh/h	5421	0	0	5421	3548	1615
Grp Volume(v), veh/h	964	0	0	1294	1075	0
Grp Sat Flow(s),veh/h/ln	1695	0	0	1695	1774	1615
Q Serve(g_s), s	5.5	0.0	0.0	8.1	10.3	0.0
Cycle Q Clear(g_c), s	5.5	0.0	0.0	8.1	10.3	0.0
Prop In Lane		0.00	0.00		1.00	1.00
Lane Grp Cap(c), veh/h	1947	0	0	1947	1355	617
V/C Ratio(X)	0.50	0.00	0.00	0.66	0.79	0.00
Avail Cap(c_a), veh/h	2392	0	0	2392	1669	760
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	9.0	0.0	0.0	9.8	10.5	0.0
Incr Delay (d2), s/veh	0.2	0.0	0.0	0.5	2.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.6	0.0	0.0	3.8	5.3	0.0
LnGrp Delay(d),s/veh	9.2	0.0	0.0	10.3	12.7	0.0
LnGrp LOS	A			B	B	
Approach Vol, veh/h	964			1294	1075	
Approach Delay, s/veh	9.2			10.3	12.7	
Approach LOS	A			B	B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4				8
Phs Duration (G+Y+Rc), s		19.1		19.1				19.1
Change Period (Y+Rc), s		4.5		4.5				4.5
Max Green Setting (Gmax), s		18.0		18.0				18.0
Max Q Clear Time (g_c+I1), s		12.3		7.5				10.1
Green Ext Time (p_c), s		2.3		4.2				4.6

Intersection Summary		
HCM 2010 Ctrl Delay		10.7
HCM 2010 LOS		B

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	217	37	241	23	48	133	200	1259	48	110	1353	436
Future Volume (veh/h)	217	37	241	23	48	133	200	1259	48	110	1353	436
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.95	1.00		0.97	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	221	38	48	23	49	10	204	1285	44	112	1381	142
Adj No. of Lanes	1	1	1	1	1	1	2	3	0	1	3	1
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	320	336	279	114	120	97	307	1777	61	143	1748	534
Arrive On Green	0.18	0.18	0.18	0.06	0.06	0.06	0.09	0.35	0.35	0.08	0.34	0.34
Sat Flow, veh/h	1774	1863	1546	1774	1863	1509	3442	5043	173	1774	5085	1554
Grp Volume(v), veh/h	221	38	48	23	49	10	204	864	465	112	1381	142
Grp Sat Flow(s),veh/h/ln	1774	1863	1546	1774	1863	1509	1721	1695	1826	1774	1695	1554
Q Serve(g_s), s	6.5	1.0	1.5	0.7	1.4	0.3	3.2	12.4	12.4	3.5	13.7	3.7
Cycle Q Clear(g_c), s	6.5	1.0	1.5	0.7	1.4	0.3	3.2	12.4	12.4	3.5	13.7	3.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.09	1.00		1.00
Lane Grp Cap(c), veh/h	320	336	279	114	120	97	307	1195	643	143	1748	534
V/C Ratio(X)	0.69	0.11	0.17	0.20	0.41	0.10	0.66	0.72	0.72	0.78	0.79	0.27
Avail Cap(c_a), veh/h	571	600	498	571	600	486	326	1231	663	181	1883	576
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	21.4	19.2	19.4	24.8	25.1	24.6	24.6	15.7	15.7	25.2	16.5	13.2
Incr Delay (d2), s/veh	2.7	0.1	0.3	0.9	2.2	0.5	4.6	2.1	3.8	15.7	2.2	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.4	0.5	0.6	0.4	0.8	0.2	1.7	6.1	6.9	2.3	6.8	1.6
LnGrp Delay(d),s/veh	24.1	19.3	19.7	25.6	27.3	25.1	29.2	17.8	19.5	40.9	18.7	13.5
LnGrp LOS	C	B	B	C	C	C	C	B	B	D	B	B
Approach Vol, veh/h		307			82			1533			1635	
Approach Delay, s/veh		22.8			26.6			19.8			19.8	
Approach LOS		C			C			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	9.0	24.2		14.6	9.5	23.7		8.1
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5
Max Green Setting (Gmax), s	5.7	20.3		18.0	5.3	20.7		18.0
Max Q Clear Time (g_c+I1), s	5.5	14.4		8.5	5.2	15.7		3.4
Green Ext Time (p_c), s	0.0	3.7		0.7	0.0	3.5		0.2

Intersection Summary		
HCM 2010 Ctrl Delay		20.2
HCM 2010 LOS		C

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	156	1044	0	1602	863	0
Future Volume (veh/h)	156	1044	0	1602	863	0
Number	7	14	5	2	6	16
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	0	1863	1863	0
Adj Flow Rate, veh/h	161	1015	0	1652	890	0
Adj No. of Lanes	1	2	0	3	3	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	0	2	2	0
Cap, veh/h	722	1135	0	2058	2058	0
Arrive On Green	0.41	0.41	0.00	0.40	0.40	0.00
Sat Flow, veh/h	1774	2787	0	5421	5421	0
Grp Volume(v), veh/h	161	1015	0	1652	890	0
Grp Sat Flow(s),veh/h/ln	1774	1393	0	1695	1695	0
Q Serve(g_s), s	2.8	16.3	0.0	13.7	6.0	0.0
Cycle Q Clear(g_c), s	2.8	16.3	0.0	13.7	6.0	0.0
Prop In Lane	1.00	1.00	0.00			0.00
Lane Grp Cap(c), veh/h	722	1135	0	2058	2058	0
V/C Ratio(X)	0.22	0.89	0.00	0.80	0.43	0.00
Avail Cap(c_a), veh/h	760	1193	0	2178	2178	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	9.3	13.2	0.0	12.6	10.3	0.0
Incr Delay (d2), s/veh	0.2	8.7	0.0	2.2	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	7.6	0.0	6.7	2.8	0.0
LnGrp Delay(d),s/veh	9.4	21.9	0.0	14.7	10.4	0.0
LnGrp LOS	A	C		B	B	
Approach Vol, veh/h	1176			1652	890	
Approach Delay, s/veh	20.2			14.7	10.4	
Approach LOS	C			B	B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		
Phs Duration (G+Y+Rc), s		23.9		24.0		23.9		
Change Period (Y+Rc), s		4.5		4.5		4.5		
Max Green Setting (Gmax), s		20.5		20.5		20.5		
Max Q Clear Time (g_c+I1), s		15.7		18.3		8.0		
Green Ext Time (p_c), s		3.7		1.2		4.4		

Intersection Summary		
HCM 2010 Ctrl Delay		15.4
HCM 2010 LOS		B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	112	101	55	238	115	48	133	590	200	85	415	113
Future Volume (veh/h)	112	101	55	238	115	48	133	590	200	85	415	113
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		0.98	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	117	105	12	248	120	13	139	615	77	89	432	39
Adj No. of Lanes	2	2	1	2	2	1	2	2	1	2	2	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	302	439	345	382	522	350	325	950	594	262	886	525
Arrive On Green	0.09	0.12	0.12	0.11	0.15	0.15	0.09	0.27	0.27	0.08	0.25	0.25
Sat Flow, veh/h	3442	3539	1576	3442	3539	1553	3442	3539	1560	3442	3539	1543
Grp Volume(v), veh/h	117	105	12	248	120	13	139	615	77	89	432	39
Grp Sat Flow(s),veh/h/ln	1721	1770	1576	1721	1770	1553	1721	1770	1560	1721	1770	1543
Q Serve(g_s), s	1.4	1.1	0.3	3.0	1.3	0.3	1.6	6.6	1.4	1.1	4.5	0.7
Cycle Q Clear(g_c), s	1.4	1.1	0.3	3.0	1.3	0.3	1.6	6.6	1.4	1.1	4.5	0.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	302	439	345	382	522	350	325	950	594	262	886	525
V/C Ratio(X)	0.39	0.24	0.03	0.65	0.23	0.04	0.43	0.65	0.13	0.34	0.49	0.07
Avail Cap(c_a), veh/h	442	1487	812	458	1504	781	402	1512	842	402	1512	798
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	18.5	16.9	13.2	18.2	16.1	13.0	18.3	13.9	8.7	18.8	13.7	9.6
Incr Delay (d2), s/veh	0.8	0.3	0.0	2.4	0.2	0.0	0.9	0.7	0.1	0.8	0.4	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	0.6	0.1	1.5	0.6	0.1	0.8	3.3	0.6	0.5	2.2	0.3
LnGrp Delay(d),s/veh	19.3	17.2	13.2	20.6	16.3	13.1	19.2	14.6	8.8	19.5	14.1	9.7
LnGrp LOS	B	B	B	C	B	B	B	B	A	B	B	A
Approach Vol, veh/h		234			381			831			560	
Approach Delay, s/veh		18.0			19.0			14.8			14.7	
Approach LOS		B			B			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.8	16.0	9.3	9.8	8.5	15.2	8.3	10.8
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	5.0	18.3	5.7	18.0	5.0	18.3	5.5	18.2
Max Q Clear Time (g_c+I1), s	3.1	8.6	5.0	3.1	3.6	6.5	3.4	3.3
Green Ext Time (p_c), s	0.0	2.7	0.1	0.4	0.0	2.0	0.1	0.5

Intersection Summary		
HCM 2010 Ctrl Delay		16.0
HCM 2010 LOS		B

Intersection	
Int Delay, s/veh	6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	3	0	81	5	155	2	142	27	89	254	2
Future Vol, veh/h	1	3	0	81	5	155	2	142	27	89	254	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	3	0	86	5	165	2	151	29	95	270	2

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	716	645	271	633	632	166	272	0	0	180	0	0
Stage 1	461	461	-	170	170	-	-	-	-	-	-	-
Stage 2	255	184	-	463	462	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	345	391	768	392	398	878	1291	-	-	1396	-	-
Stage 1	581	565	-	832	758	-	-	-	-	-	-	-
Stage 2	749	747	-	579	565	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	260	359	768	365	365	878	1291	-	-	1396	-	-
Mov Cap-2 Maneuver	260	359	-	365	365	-	-	-	-	-	-	-
Stage 1	580	520	-	830	756	-	-	-	-	-	-	-
Stage 2	603	746	-	529	520	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	16.1	15.9	0.1	2
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1291	-	-	328	585	1396	-	-
HCM Lane V/C Ratio	0.002	-	-	0.013	0.438	0.068	-	-
HCM Control Delay (s)	7.8	0	-	16.1	15.9	7.8	0	-
HCM Lane LOS	A	A	-	C	C	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0	2.2	0.2	-	-

Intersection	
Int Delay, s/veh	2.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	69	0	10	0	72	67	30	305	0
Future Vol, veh/h	0	0	0	69	0	10	0	72	67	30	305	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	0	-	-	0	-	-	50	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	75	0	11	0	78	73	33	332	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	518	549	332	513	513	115	332	0	0	151	0	0
Stage 1	398	398	-	115	115	-	-	-	-	-	-	-
Stage 2	120	151	-	398	398	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	468	443	710	472	465	937	1227	-	-	1430	-	-
Stage 1	628	603	-	890	800	-	-	-	-	-	-	-
Stage 2	884	772	-	628	603	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	454	433	710	464	454	937	1227	-	-	1430	-	-
Mov Cap-2 Maneuver	454	433	-	464	454	-	-	-	-	-	-	-
Stage 1	628	589	-	890	800	-	-	-	-	-	-	-
Stage 2	874	772	-	614	589	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	13.5	0	0.7
HCM LOS	A	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1227	-	-	-	464	937	1430	-	-
HCM Lane V/C Ratio	-	-	-	-	0.162	0.012	0.023	-	-
HCM Control Delay (s)	0	-	-	0	14.2	8.9	7.6	-	-
HCM Lane LOS	A	-	-	A	B	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	-	0.6	0	0.1	-	-

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	871	1425	52	0	20
Future Vol, veh/h	0	871	1425	52	0	20
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	947	1549	57	0	22

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	803
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.32
Pot Cap-1 Maneuver	0	-	-	-	0	326
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	-	326
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

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

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	326
HCM Lane V/C Ratio	-	-	-	0.067
HCM Control Delay (s)	-	-	-	16.8
HCM Lane LOS	-	-	-	C
HCM 95th %tile Q(veh)	-	-	-	0.2

APPENDIX D

OPENING YEAR (2023) CONDITIONS PEAK HOUR INTERSECTION ANALYSIS WORKSHEETS

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	17	876	268	59	527	215	195	195	94	258	240	9
Future Volume (veh/h)	17	876	268	59	527	215	195	195	94	258	240	9
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		0.99	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	18	932	91	63	561	81	207	207	10	274	255	5
Adj No. of Lanes	1	2	1	1	3	1	2	2	1	2	2	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	39	1202	538	103	1910	587	325	445	197	402	526	10
Arrive On Green	0.02	0.34	0.34	0.06	0.38	0.38	0.09	0.13	0.13	0.12	0.15	0.15
Sat Flow, veh/h	1774	3539	1583	1774	5085	1563	3442	3539	1568	3442	3549	69
Grp Volume(v), veh/h	18	932	91	63	561	81	207	207	10	274	127	133
Grp Sat Flow(s),veh/h/ln	1774	1770	1583	1774	1695	1563	1721	1770	1568	1721	1770	1848
Q Serve(g_s), s	0.5	11.8	2.0	1.7	3.9	1.7	2.9	2.7	0.3	3.8	3.3	3.3
Cycle Q Clear(g_c), s	0.5	11.8	2.0	1.7	3.9	1.7	2.9	2.7	0.3	3.8	3.3	3.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.04
Lane Grp Cap(c), veh/h	39	1202	538	103	1910	587	325	445	197	402	262	274
V/C Ratio(X)	0.46	0.78	0.17	0.61	0.29	0.14	0.64	0.47	0.05	0.68	0.48	0.49
Avail Cap(c_a), veh/h	177	1450	648	177	2083	640	447	1343	595	516	707	739
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	24.2	14.8	11.6	23.0	11.0	10.3	21.8	20.3	19.3	21.2	19.6	19.6
Incr Delay (d2), s/veh	8.1	2.2	0.1	5.7	0.1	0.1	2.1	0.8	0.1	2.5	1.4	1.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	6.1	0.9	1.0	1.8	0.7	1.5	1.4	0.1	2.0	1.7	1.8
LnGrp Delay(d),s/veh	32.3	17.1	11.7	28.7	11.0	10.4	23.9	21.1	19.4	23.7	20.9	20.9
LnGrp LOS	C	B	B	C	B	B	C	C	B	C	C	C
Approach Vol, veh/h		1041			705			424			534	
Approach Delay, s/veh		16.9			12.6			22.4			22.3	
Approach LOS		B			B			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.3	10.8	7.4	21.5	9.2	11.9	5.6	23.3
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	7.5	19.0	5.0	20.5	6.5	20.0	5.0	20.5
Max Q Clear Time (g_c+I1), s	5.8	4.7	3.7	13.8	4.9	5.3	2.5	5.9
Green Ext Time (p_c), s	0.2	0.9	0.0	3.2	0.1	1.0	0.0	3.0

Intersection Summary	
HCM 2010 Ctrl Delay	17.7
HCM 2010 LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	1099	163	282	471	24	338	3	323	3	24	6
Future Volume (veh/h)	4	1099	163	282	471	24	338	3	323	3	24	6
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	4	1169	162	300	501	14	360	3	49	3	26	0
Adj No. of Lanes	2	2	0	2	2	1	2	1	0	1	2	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	18	1393	192	398	1969	930	506	13	215	55	110	58
Arrive On Green	0.01	0.45	0.45	0.12	0.56	0.56	0.14	0.14	0.14	0.03	0.03	0.00
Sat Flow, veh/h	3442	3125	432	3442	3539	1583	3548	92	1505	1774	3539	1583
Grp Volume(v), veh/h	4	660	671	300	501	14	360	0	52	3	26	0
Grp Sat Flow(s),veh/h/ln	1721	1770	1787	1721	1770	1583	1774	0	1597	1774	1770	1583
Q Serve(g_s), s	0.1	22.4	22.6	5.7	5.0	0.3	6.6	0.0	2.0	0.1	0.5	0.0
Cycle Q Clear(g_c), s	0.1	22.4	22.6	5.7	5.0	0.3	6.6	0.0	2.0	0.1	0.5	0.0
Prop In Lane	1.00		0.24	1.00		1.00	1.00		0.94	1.00		1.00
Lane Grp Cap(c), veh/h	18	789	797	398	1969	930	506	0	228	55	110	58
V/C Ratio(X)	0.22	0.84	0.84	0.75	0.25	0.02	0.71	0.00	0.23	0.05	0.24	0.00
Avail Cap(c_a), veh/h	253	924	933	466	2066	973	1007	0	453	470	937	428
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	33.7	16.7	16.7	29.1	7.8	5.8	27.8	0.0	25.8	32.0	32.2	0.0
Incr Delay (d2), s/veh	5.8	6.0	6.2	5.8	0.1	0.0	1.9	0.0	0.5	0.4	1.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	12.1	12.4	3.0	2.5	0.1	3.3	0.0	0.9	0.1	0.3	0.0
LnGrp Delay(d),s/veh	39.4	22.7	22.9	34.9	7.9	5.9	29.7	0.0	26.3	32.4	33.3	0.0
LnGrp LOS	D	C	C	C	A	A	C		C	C	C	
Approach Vol, veh/h		1335			815			412			29	
Approach Delay, s/veh		22.8			17.8			29.3			33.2	
Approach LOS		C			B			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		14.2	12.4	34.8		6.6	4.9	42.3
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		19.3	9.2	35.5		18.0	5.0	39.7
Max Q Clear Time (g_c+I1), s		8.6	7.7	24.6		2.5	2.1	7.0
Green Ext Time (p_c), s		1.1	0.2	5.7		0.1	0.0	3.0

Intersection Summary	
HCM 2010 Ctrl Delay	22.4
HCM 2010 LOS	C

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	181	1252	30	99	591	39	41	127	103	33	60	112
Future Volume (veh/h)	181	1252	30	99	591	39	41	127	103	33	60	112
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	193	1332	16	105	629	17	44	135	9	35	64	10
Adj No. of Lanes	1	2	1	1	2	1	1	1	1	1	1	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	250	1711	765	143	1497	669	303	262	222	248	262	222
Arrive On Green	0.14	0.48	0.48	0.08	0.42	0.42	0.14	0.14	0.14	0.14	0.14	0.14
Sat Flow, veh/h	1774	3539	1582	1774	3539	1581	1320	1863	1583	1239	1863	1583
Grp Volume(v), veh/h	193	1332	16	105	629	17	44	135	9	35	64	10
Grp Sat Flow(s),veh/h/ln	1774	1770	1582	1774	1770	1581	1320	1863	1583	1239	1863	1583
Q Serve(g_s), s	4.8	14.2	0.2	2.6	5.7	0.3	1.4	3.1	0.2	1.2	1.4	0.2
Cycle Q Clear(g_c), s	4.8	14.2	0.2	2.6	5.7	0.3	2.8	3.1	0.2	4.3	1.4	0.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	250	1711	765	143	1497	669	303	262	222	248	262	222
V/C Ratio(X)	0.77	0.78	0.02	0.73	0.42	0.03	0.15	0.52	0.04	0.14	0.24	0.04
Avail Cap(c_a), veh/h	528	2054	918	214	1497	669	681	795	676	604	795	676
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	18.9	9.8	6.2	20.5	9.2	7.7	18.7	18.2	17.0	20.2	17.5	17.0
Incr Delay (d2), s/veh	5.0	1.6	0.0	7.1	0.2	0.0	0.2	1.6	0.1	0.3	0.5	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.7	7.2	0.1	1.6	2.7	0.1	0.5	1.7	0.1	0.4	0.7	0.1
LnGrp Delay(d),s/veh	23.9	11.4	6.2	27.6	9.4	7.7	18.9	19.8	17.0	20.4	18.0	17.1
LnGrp LOS	C	B	A	C	A	A	B	B	B	C	B	B
Approach Vol, veh/h		1541			751			188			109	
Approach Delay, s/veh		12.9			11.9			19.4			18.7	
Approach LOS		B			B			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		10.9	8.2	26.6		10.9	10.9	23.8
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		19.5	5.5	26.5		19.5	13.6	18.4
Max Q Clear Time (g_c+I1), s		5.1	4.6	16.2		6.3	6.8	7.7
Green Ext Time (p_c), s		0.6	0.0	5.8		0.3	0.3	2.7

Intersection Summary	
HCM 2010 Ctrl Delay	13.4
HCM 2010 LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	40	1397	53	172	625	22	29	86	414	29	42	17
Future Volume (veh/h)	40	1397	53	172	625	22	29	86	414	29	42	17
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	43	1486	50	183	665	11	31	91	228	31	45	3
Adj No. of Lanes	1	3	0	1	2	1	1	2	0	1	2	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	81	1903	64	231	1632	730	420	371	328	230	708	47
Arrive On Green	0.05	0.38	0.38	0.13	0.46	0.46	0.21	0.21	0.21	0.21	0.21	0.21
Sat Flow, veh/h	1774	5053	170	1774	3539	1583	1350	1770	1560	1056	3370	222
Grp Volume(v), veh/h	43	997	539	183	665	11	31	91	228	31	23	25
Grp Sat Flow(s),veh/h/ln	1774	1695	1833	1774	1770	1583	1350	1770	1560	1056	1770	1823
Q Serve(g_s), s	1.1	12.4	12.4	4.8	5.9	0.2	0.9	2.0	6.4	1.3	0.5	0.5
Cycle Q Clear(g_c), s	1.1	12.4	12.4	4.8	5.9	0.2	1.4	2.0	6.4	7.8	0.5	0.5
Prop In Lane	1.00		0.09	1.00		1.00	1.00		1.00	1.00		0.12
Lane Grp Cap(c), veh/h	81	1276	690	231	1632	730	420	371	328	230	371	383
V/C Ratio(X)	0.53	0.78	0.78	0.79	0.41	0.02	0.07	0.24	0.70	0.13	0.06	0.06
Avail Cap(c_a), veh/h	212	1388	750	279	1632	730	689	725	639	441	725	746
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	22.2	13.1	13.1	20.1	8.5	7.0	15.6	15.7	17.4	21.0	15.1	15.1
Incr Delay (d2), s/veh	5.3	2.7	4.9	12.1	0.2	0.0	0.1	0.3	2.7	0.3	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	6.2	7.1	3.1	2.9	0.1	0.3	1.0	3.0	0.4	0.3	0.3
LnGrp Delay(d),s/veh	27.6	15.8	18.1	32.2	8.7	7.0	15.7	16.0	20.1	21.3	15.1	15.1
LnGrp LOS	C	B	B	C	A	A	B	B	C	C	B	B
Approach Vol, veh/h		1579			859			350			79	
Approach Delay, s/veh		16.9			13.7			18.6			17.5	
Approach LOS		B			B			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		14.5	10.7	22.4		14.5	6.7	26.5
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		19.5	7.5	19.5		19.5	5.7	21.3
Max Q Clear Time (g_c+I1), s		8.4	6.8	14.4		9.8	3.1	7.9
Green Ext Time (p_c), s		1.3	0.0	3.6		0.2	0.0	3.2

Intersection Summary			
HCM 2010 Ctrl Delay			16.2
HCM 2010 LOS			B

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	76	1768	798	26	20	25
Future Volume (veh/h)	76	1768	798	26	20	25
Number	7	4	8	18	1	16
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1900	1863	1863
Adj Flow Rate, veh/h	81	1881	849	25	21	0
Adj No. of Lanes	1	3	3	0	2	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	625	3311	3306	97	93	43
Arrive On Green	0.65	0.65	0.65	0.65	0.03	0.00
Sat Flow, veh/h	632	5253	5245	149	3442	1583
Grp Volume(v), veh/h	81	1881	566	308	21	0
Grp Sat Flow(s),veh/h/ln	632	1695	1695	1836	1721	1583
Q Serve(g_s), s	1.7	5.7	2.0	2.0	0.2	0.0
Cycle Q Clear(g_c), s	3.7	5.7	2.0	2.0	0.2	0.0
Prop In Lane	1.00			0.08	1.00	1.00
Lane Grp Cap(c), veh/h	625	3311	2207	1196	93	43
V/C Ratio(X)	0.13	0.57	0.26	0.26	0.23	0.00
Avail Cap(c_a), veh/h	722	4094	2729	1479	2278	1048
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	2.8	2.7	2.0	2.0	13.3	0.0
Incr Delay (d2), s/veh	0.1	0.2	0.1	0.1	1.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	2.5	0.9	1.0	0.1	0.0
LnGrp Delay(d),s/veh	2.9	2.9	2.1	2.2	14.5	0.0
LnGrp LOS	A	A	A	A	B	
Approach Vol, veh/h		1962	874		21	
Approach Delay, s/veh		2.9	2.1		14.5	
Approach LOS		A	A		B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs				4		6		8
Phs Duration (G+Y+Rc), s				22.7		5.3		22.7
Change Period (Y+Rc), s				4.5		4.5		4.5
Max Green Setting (Gmax), s				22.5		18.5		22.5
Max Q Clear Time (g_c+I1), s				7.7		2.2		4.0
Green Ext Time (p_c), s				10.5		0.0		4.7

Intersection Summary	
HCM 2010 Ctrl Delay	2.7
HCM 2010 LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	1751	3	17	786	45	13	1	13	24	0	22
Future Volume (veh/h)	30	1751	3	17	786	45	13	1	13	24	0	22
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1900	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	32	1863	3	18	836	29	14	1	0	26	0	10
Adj No. of Lanes	1	3	0	1	3	1	0	1	0	2	0	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	485	2761	4	259	2606	811	35	3	0	150	0	67
Arrive On Green	0.04	0.53	0.53	0.02	0.51	0.51	0.02	0.02	0.00	0.04	0.00	0.04
Sat Flow, veh/h	1774	5243	8	1774	5085	1582	1661	119	0	3548	0	1579
Grp Volume(v), veh/h	32	1205	661	18	836	29	15	0	0	26	0	10
Grp Sat Flow(s),veh/h/ln	1774	1695	1861	1774	1695	1582	1780	0	0	1774	0	1579
Q Serve(g_s), s	0.4	12.1	12.1	0.2	4.5	0.4	0.4	0.0	0.0	0.3	0.0	0.3
Cycle Q Clear(g_c), s	0.4	12.1	12.1	0.2	4.5	0.4	0.4	0.0	0.0	0.3	0.0	0.3
Prop In Lane	1.00		0.00	1.00		1.00	0.93		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	485	1785	980	259	2606	811	38	0	0	150	0	67
V/C Ratio(X)	0.07	0.67	0.67	0.07	0.32	0.04	0.39	0.00	0.00	0.17	0.00	0.15
Avail Cap(c_a), veh/h	611	2240	1230	411	3360	1045	701	0	0	1375	0	612
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	5.0	8.1	8.1	6.6	6.6	5.6	22.4	0.0	0.0	21.5	0.0	21.4
Incr Delay (d2), s/veh	0.1	0.6	1.0	0.1	0.1	0.0	6.5	0.0	0.0	0.5	0.0	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	5.7	6.3	0.1	2.0	0.2	0.3	0.0	0.0	0.2	0.0	0.1
LnGrp Delay(d),s/veh	5.1	8.6	9.1	6.7	6.7	5.6	29.0	0.0	0.0	22.0	0.0	22.5
LnGrp LOS	A	A	A	A	A	A	C			C		C
Approach Vol, veh/h		1898			883			15			36	
Approach Delay, s/veh		8.8			6.6			29.0			22.1	
Approach LOS		A			A			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		5.5	5.5	29.0		6.5	6.2	28.3
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		18.3	5.0	30.7		18.0	5.0	30.7
Max Q Clear Time (g_c+I1), s		2.4	2.2	14.1		2.3	2.4	6.5
Green Ext Time (p_c), s		0.0	0.0	10.3		0.0	0.0	5.3

Intersection Summary	
HCM 2010 Ctrl Delay	8.4
HCM 2010 LOS	A

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	247	1144	410	66	580	265	198	437	40	385	439	81
Future Volume (veh/h)	247	1144	410	66	580	265	198	437	40	385	439	81
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	263	1217	338	70	617	225	211	465	6	410	467	42
Adj No. of Lanes	2	3	1	2	3	1	2	3	1	2	3	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	370	1586	641	203	1339	658	321	810	252	525	1039	92
Arrive On Green	0.11	0.31	0.31	0.06	0.26	0.26	0.09	0.16	0.16	0.15	0.22	0.22
Sat Flow, veh/h	3442	5085	1582	3442	5085	1582	3442	5085	1580	3442	4755	422
Grp Volume(v), veh/h	263	1217	338	70	617	225	211	465	6	410	331	178
Grp Sat Flow(s),veh/h/ln	1721	1695	1582	1721	1695	1582	1721	1695	1580	1721	1695	1788
Q Serve(g_s), s	4.2	12.3	9.2	1.1	5.8	5.5	3.4	4.8	0.2	6.5	4.8	4.9
Cycle Q Clear(g_c), s	4.2	12.3	9.2	1.1	5.8	5.5	3.4	4.8	0.2	6.5	4.8	4.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.24
Lane Grp Cap(c), veh/h	370	1586	641	203	1339	658	321	810	252	525	741	391
V/C Ratio(X)	0.71	0.77	0.53	0.35	0.46	0.34	0.66	0.57	0.02	0.78	0.45	0.46
Avail Cap(c_a), veh/h	382	1730	686	303	1614	744	455	1632	507	576	1207	637
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	24.5	17.7	12.8	25.6	17.5	11.3	24.8	22.1	20.1	23.1	19.2	19.2
Incr Delay (d2), s/veh	5.8	2.0	0.7	1.0	0.2	0.3	2.3	0.6	0.0	6.3	0.4	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.3	6.0	4.0	0.6	2.7	2.4	1.7	2.3	0.1	3.5	2.3	2.5
LnGrp Delay(d),s/veh	30.3	19.6	13.4	26.6	17.8	11.6	27.1	22.7	20.2	29.4	19.6	20.1
LnGrp LOS	C	B	B	C	B	B	C	C	C	C	B	C
Approach Vol, veh/h		1818			912			682			919	
Approach Delay, s/veh		20.0			16.9			24.0			24.1	
Approach LOS		C			B			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.2	13.5	7.8	22.2	9.8	16.9	10.6	19.4
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	9.5	18.2	5.0	19.3	7.5	20.2	6.3	18.0
Max Q Clear Time (g_c+I1), s	8.5	6.8	3.1	14.3	5.4	6.9	6.2	7.8
Green Ext Time (p_c), s	0.2	2.1	0.0	3.4	0.1	2.3	0.0	3.2

Intersection Summary	
HCM 2010 Ctrl Delay	20.9
HCM 2010 LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	18	1376	170	141	842	24	79	9	141	13	7	1
Future Volume (veh/h)	18	1376	170	141	842	24	79	9	141	13	7	1
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	19	1464	84	150	896	14	84	10	12	14	7	0
Adj No. of Lanes	1	3	1	1	3	1	1	1	1	1	2	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	42	2271	707	194	2706	842	318	179	152	312	340	0
Arrive On Green	0.02	0.45	0.45	0.11	0.53	0.53	0.10	0.10	0.10	0.10	0.10	0.00
Sat Flow, veh/h	1774	5085	1583	1774	5085	1583	1403	1863	1583	1384	3632	0
Grp Volume(v), veh/h	19	1464	84	150	896	14	84	10	12	14	7	0
Grp Sat Flow(s),veh/h/ln	1774	1695	1583	1774	1695	1583	1403	1863	1583	1384	1770	0
Q Serve(g_s), s	0.4	8.7	1.2	3.2	3.9	0.2	2.2	0.2	0.3	0.4	0.1	0.0
Cycle Q Clear(g_c), s	0.4	8.7	1.2	3.2	3.9	0.2	2.3	0.2	0.3	0.5	0.1	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	42	2271	707	194	2706	842	318	179	152	312	340	0
V/C Ratio(X)	0.45	0.64	0.12	0.77	0.33	0.02	0.26	0.06	0.08	0.04	0.02	0.00
Avail Cap(c_a), veh/h	229	2661	828	370	3067	955	838	869	739	825	1651	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	18.7	8.3	6.3	16.8	5.2	4.3	16.9	15.9	16.0	16.2	15.9	0.0
Incr Delay (d2), s/veh	7.3	0.4	0.1	6.4	0.1	0.0	0.4	0.1	0.2	0.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	4.0	0.5	1.9	1.8	0.1	0.9	0.1	0.1	0.1	0.0	0.0
LnGrp Delay(d),s/veh	26.0	8.8	6.3	23.3	5.2	4.3	17.4	16.1	16.2	16.2	15.9	0.0
LnGrp LOS	C	A	A	C	A	A	B	B	B	B	B	
Approach Vol, veh/h		1567			1060			106			21	
Approach Delay, s/veh		8.8			7.8			17.1			16.1	
Approach LOS		A			A			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		8.2	8.7	21.8		8.2	5.4	25.1
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		18.1	8.1	20.3		18.1	5.0	23.4
Max Q Clear Time (g_c+I1), s		4.3	5.2	10.7		2.5	2.4	5.9
Green Ext Time (p_c), s		0.2	0.1	6.7		0.0	0.0	6.0

Intersection Summary		
HCM 2010 Ctrl Delay		8.8
HCM 2010 LOS		A

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	980	0	0	686	406	278
Future Volume (veh/h)	980	0	0	686	406	278
Number	4	14	3	8	5	12
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	0	0	1863	1863	1900
Adj Flow Rate, veh/h	1043	0	0	730	353	358
Adj No. of Lanes	3	0	0	3	1	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	0	0	2	2	0
Cap, veh/h	1942	0	0	1942	569	518
Arrive On Green	0.38	0.00	0.00	0.38	0.32	0.32
Sat Flow, veh/h	5421	0	0	5421	1774	1615
Grp Volume(v), veh/h	1043	0	0	730	353	358
Grp Sat Flow(s),veh/h/ln	1695	0	0	1695	1774	1615
Q Serve(g_s), s	4.8	0.0	0.0	3.1	5.1	5.9
Cycle Q Clear(g_c), s	4.8	0.0	0.0	3.1	5.1	5.9
Prop In Lane		0.00	0.00		1.00	1.00
Lane Grp Cap(c), veh/h	1942	0	0	1942	569	518
V/C Ratio(X)	0.54	0.00	0.00	0.38	0.62	0.69
Avail Cap(c_a), veh/h	3024	0	0	3024	1055	960
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	7.3	0.0	0.0	6.8	8.7	9.0
Incr Delay (d2), s/veh	0.2	0.0	0.0	0.1	1.1	1.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.3	0.0	0.0	1.4	2.6	2.8
LnGrp Delay(d),s/veh	7.5	0.0	0.0	6.9	9.8	10.6
LnGrp LOS	A			A	A	B
Approach Vol, veh/h	1043			730	711	
Approach Delay, s/veh	7.5			6.9	10.2	
Approach LOS	A			A	B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4				8
Phs Duration (G+Y+Rc), s		14.2		16.1				16.1
Change Period (Y+Rc), s		4.5		4.5				4.5
Max Green Setting (Gmax), s		18.0		18.0				18.0
Max Q Clear Time (g_c+I1), s		7.9		6.8				5.1
Green Ext Time (p_c), s		1.9		4.7				3.5

Intersection Summary	
HCM 2010 Ctrl Delay	8.1
HCM 2010 LOS	A

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	40	9	29	3	8	26	35	1033	14	35	938	85
Future Volume (veh/h)	40	9	29	3	8	26	35	1033	14	35	938	85
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	43	10	0	3	9	0	37	1099	14	37	998	43
Adj No. of Lanes	1	1	1	1	1	1	2	3	0	1	3	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	106	111	94	28	29	25	148	1939	25	76	1905	593
Arrive On Green	0.06	0.06	0.00	0.02	0.02	0.00	0.04	0.37	0.37	0.04	0.37	0.37
Sat Flow, veh/h	1774	1863	1583	1774	1863	1583	3442	5175	66	1774	5085	1583
Grp Volume(v), veh/h	43	10	0	3	9	0	37	720	393	37	998	43
Grp Sat Flow(s),veh/h/ln	1774	1863	1583	1774	1863	1583	1721	1695	1851	1774	1695	1583
Q Serve(g_s), s	0.8	0.2	0.0	0.1	0.2	0.0	0.4	6.0	6.0	0.7	5.4	0.6
Cycle Q Clear(g_c), s	0.8	0.2	0.0	0.1	0.2	0.0	0.4	6.0	6.0	0.7	5.4	0.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.04	1.00		1.00
Lane Grp Cap(c), veh/h	106	111	94	28	29	25	148	1270	694	76	1905	593
V/C Ratio(X)	0.41	0.09	0.00	0.11	0.31	0.00	0.25	0.57	0.57	0.48	0.52	0.07
Avail Cap(c_a), veh/h	899	944	803	899	944	803	485	1996	1090	255	3008	937
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	16.1	15.8	0.0	17.2	17.3	0.0	16.4	8.8	8.8	16.6	8.6	7.1
Incr Delay (d2), s/veh	2.5	0.3	0.0	1.7	5.8	0.0	0.9	0.4	0.7	4.7	0.2	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	0.1	0.0	0.0	0.1	0.0	0.2	2.9	3.2	0.4	2.5	0.3
LnGrp Delay(d),s/veh	18.6	16.1	0.0	18.9	23.1	0.0	17.3	9.2	9.5	21.3	8.9	7.2
LnGrp LOS	B	B		B	C		B	A	A	C	A	A
Approach Vol, veh/h		53			12			1150			1078	
Approach Delay, s/veh		18.1			22.0			9.6			9.2	
Approach LOS		B			C			A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	6.0	17.8		6.6	6.0	17.8		5.1
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5
Max Green Setting (Gmax), s	5.1	20.9		18.0	5.0	21.0		18.0
Max Q Clear Time (g_c+I1), s	2.7	8.0		2.8	2.4	7.4		2.2
Green Ext Time (p_c), s	0.0	5.3		0.1	0.0	5.3		0.0

Intersection Summary			
HCM 2010 Ctrl Delay			9.7
HCM 2010 LOS			A

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	92	713	0	1104	347	0
Future Volume (veh/h)	92	713	0	1104	347	0
Number	7	14	5	2	6	16
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	0	1863	1863	0
Adj Flow Rate, veh/h	98	319	0	1174	369	0
Adj No. of Lanes	1	2	0	3	3	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	0	2	2	0
Cap, veh/h	382	599	0	2280	2280	0
Arrive On Green	0.22	0.22	0.00	0.45	0.45	0.00
Sat Flow, veh/h	1774	2787	0	5421	5421	0
Grp Volume(v), veh/h	98	319	0	1174	369	0
Grp Sat Flow(s),veh/h/ln	1774	1393	0	1695	1695	0
Q Serve(g_s), s	1.2	2.7	0.0	4.4	1.2	0.0
Cycle Q Clear(g_c), s	1.2	2.7	0.0	4.4	1.2	0.0
Prop In Lane	1.00	1.00	0.00			0.00
Lane Grp Cap(c), veh/h	382	599	0	2280	2280	0
V/C Ratio(X)	0.26	0.53	0.00	0.51	0.16	0.00
Avail Cap(c_a), veh/h	1194	1875	0	3422	3422	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	8.7	9.3	0.0	5.3	4.4	0.0
Incr Delay (d2), s/veh	0.4	0.7	0.0	0.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	1.1	0.0	2.0	0.5	0.0
LnGrp Delay(d),s/veh	9.1	10.0	0.0	5.5	4.4	0.0
LnGrp LOS	A	B		A	A	
Approach Vol, veh/h	417			1174	369	
Approach Delay, s/veh	9.8			5.5	4.4	
Approach LOS	A			A	A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		
Phs Duration (G+Y+Rc), s		16.5		10.3		16.5		
Change Period (Y+Rc), s		4.5		4.5		4.5		
Max Green Setting (Gmax), s		18.0		18.0		18.0		
Max Q Clear Time (g_c+I1), s		6.4		4.7		3.2		
Green Ext Time (p_c), s		5.6		1.3		1.8		

Intersection Summary		
HCM 2010 Ctrl Delay		6.2
HCM 2010 LOS		A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	29	54	39	99	41	10	66	415	92	41	190	36
Future Volume (veh/h)	29	54	39	99	41	10	66	415	92	41	190	36
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	31	57	8	105	44	2	70	441	32	44	202	10
Adj No. of Lanes	2	2	1	2	2	1	2	2	1	2	2	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	127	499	333	309	686	384	240	799	499	170	727	383
Arrive On Green	0.04	0.14	0.14	0.09	0.19	0.19	0.07	0.23	0.23	0.05	0.21	0.21
Sat Flow, veh/h	3442	3539	1580	3442	3539	1581	3442	3539	1581	3442	3539	1579
Grp Volume(v), veh/h	31	57	8	105	44	2	70	441	32	44	202	10
Grp Sat Flow(s),veh/h/ln	1721	1770	1580	1721	1770	1581	1721	1770	1581	1721	1770	1579
Q Serve(g_s), s	0.3	0.5	0.1	1.0	0.4	0.0	0.7	4.0	0.5	0.4	1.8	0.2
Cycle Q Clear(g_c), s	0.3	0.5	0.1	1.0	0.4	0.0	0.7	4.0	0.5	0.4	1.8	0.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	127	499	333	309	686	384	240	799	499	170	727	383
V/C Ratio(X)	0.24	0.11	0.02	0.34	0.06	0.01	0.29	0.55	0.06	0.26	0.28	0.03
Avail Cap(c_a), veh/h	472	1749	891	501	1778	872	472	1817	954	472	1817	869
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	17.0	13.7	11.4	15.6	12.0	10.4	16.1	12.5	8.7	16.7	12.2	10.5
Incr Delay (d2), s/veh	1.0	0.1	0.0	0.6	0.0	0.0	0.7	0.6	0.1	0.8	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.3	0.1	0.5	0.2	0.0	0.4	2.0	0.2	0.2	0.9	0.1
LnGrp Delay(d),s/veh	18.0	13.8	11.4	16.2	12.0	10.5	16.8	13.1	8.8	17.5	12.4	10.5
LnGrp LOS	B	B	B	B	B	B	B	B	A	B	B	B
Approach Vol, veh/h		96			151			543			256	
Approach Delay, s/veh		14.9			14.9			13.3			13.2	
Approach LOS		B			B			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.3	12.7	7.8	9.6	7.0	12.0	5.8	11.6
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	5.0	18.7	5.3	18.0	5.0	18.7	5.0	18.3
Max Q Clear Time (g_c+I1), s	2.4	6.0	3.0	2.5	2.7	3.8	2.3	2.4
Green Ext Time (p_c), s	0.0	2.1	0.1	0.2	0.0	0.9	0.0	0.1

Intersection Summary	
HCM 2010 Ctrl Delay	13.7
HCM 2010 LOS	B

Intersection	
Int Delay, s/veh	1.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	2	2	13	1	22	1	303	35	40	194	3
Future Vol, veh/h	1	2	2	13	1	22	1	303	35	40	194	3
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	2	2	14	1	23	1	322	37	43	206	3

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	649	655	208	639	638	341	209	0	0	359	0	0
Stage 1	294	294	-	343	343	-	-	-	-	-	-	-
Stage 2	355	361	-	296	295	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	383	386	832	389	394	701	1362	-	-	1200	-	-
Stage 1	714	670	-	672	637	-	-	-	-	-	-	-
Stage 2	662	626	-	712	669	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	358	370	832	374	377	701	1362	-	-	1200	-	-
Mov Cap-2 Maneuver	358	370	-	374	377	-	-	-	-	-	-	-
Stage 1	713	643	-	671	636	-	-	-	-	-	-	-
Stage 2	638	625	-	679	642	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	12.7	12.4	0	1.4
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1362	-	-	472	523	1200	-	-
HCM Lane V/C Ratio	0.001	-	-	0.011	0.073	0.035	-	-
HCM Control Delay (s)	7.6	0	-	12.7	12.4	8.1	0	-
HCM Lane LOS	A	A	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0	0.2	0.1	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	505	124	95	969	307	132	115	55	297	266	28
Future Volume (veh/h)	20	505	124	95	969	307	132	115	55	297	266	28
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.98	1.00		0.96	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	21	537	37	101	1031	110	140	122	5	316	283	15
Adj No. of Lanes	1	2	1	1	3	1	2	2	1	2	2	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	45	924	402	139	1595	484	309	557	239	406	634	33
Arrive On Green	0.03	0.26	0.26	0.08	0.31	0.31	0.09	0.16	0.16	0.12	0.19	0.19
Sat Flow, veh/h	1774	3539	1542	1774	5085	1544	3442	3539	1518	3442	3415	180
Grp Volume(v), veh/h	21	537	37	101	1031	110	140	122	5	316	146	152
Grp Sat Flow(s),veh/h/ln	1774	1770	1542	1774	1695	1544	1721	1770	1518	1721	1770	1826
Q Serve(g_s), s	0.5	6.2	0.8	2.6	8.1	2.5	1.8	1.4	0.1	4.2	3.4	3.5
Cycle Q Clear(g_c), s	0.5	6.2	0.8	2.6	8.1	2.5	1.8	1.4	0.1	4.2	3.4	3.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.10
Lane Grp Cap(c), veh/h	45	924	402	139	1595	484	309	557	239	406	328	339
V/C Ratio(X)	0.46	0.58	0.09	0.73	0.65	0.23	0.45	0.22	0.02	0.78	0.44	0.45
Avail Cap(c_a), veh/h	190	1365	594	190	1961	596	369	1403	602	406	720	743
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	22.4	15.0	13.1	21.0	13.8	11.8	20.2	17.2	16.6	20.0	16.9	16.9
Incr Delay (d2), s/veh	7.2	0.6	0.1	8.6	0.5	0.2	1.0	0.2	0.0	9.4	0.9	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	3.1	0.4	1.6	3.9	1.1	0.9	0.7	0.1	2.5	1.7	1.8
LnGrp Delay(d),s/veh	29.6	15.6	13.2	29.6	14.3	12.1	21.2	17.4	16.7	29.4	17.8	17.8
LnGrp LOS	C	B	B	C	B	B	C	B	B	C	B	B
Approach Vol, veh/h		595			1242			267			614	
Approach Delay, s/veh		16.0			15.4			19.4			23.8	
Approach LOS		B			B			B			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.0	11.8	8.2	16.7	8.7	13.2	5.7	19.1
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	5.5	18.5	5.0	18.0	5.0	19.0	5.0	18.0
Max Q Clear Time (g_c+I1), s	6.2	3.4	4.6	8.2	3.8	5.5	2.5	10.1
Green Ext Time (p_c), s	0.0	0.5	0.0	2.2	0.0	1.2	0.0	3.9

Intersection Summary	
HCM 2010 Ctrl Delay	17.8
HCM 2010 LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	775	104	193	1174	8	251	2	151	4	1	3
Future Volume (veh/h)	0	775	104	193	1174	8	251	2	151	4	1	3
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	0	824	100	205	1249	5	267	2	20	4	1	0
Adj No. of Lanes	2	2	0	2	2	1	2	1	0	1	2	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	8	1170	142	349	2011	910	457	19	188	12	24	0
Arrive On Green	0.00	0.37	0.37	0.10	0.57	0.57	0.13	0.13	0.13	0.01	0.01	0.00
Sat Flow, veh/h	3442	3178	386	3442	3539	1582	3548	146	1459	1774	3539	1583
Grp Volume(v), veh/h	0	459	465	205	1249	5	267	0	22	4	1	0
Grp Sat Flow(s),veh/h/ln	1721	1770	1794	1721	1770	1582	1774	0	1605	1774	1770	1583
Q Serve(g_s), s	0.0	10.1	10.1	2.6	10.7	0.1	3.2	0.0	0.6	0.1	0.0	0.3
Cycle Q Clear(g_c), s	0.0	10.1	10.1	2.6	10.7	0.1	3.2	0.0	0.6	0.1	0.0	0.3
Prop In Lane	1.00		0.21	1.00		1.00	1.00		0.91	1.00		1.00
Lane Grp Cap(c), veh/h	8	651	660	349	2011	910	457	0	207	12	24	-146
V/C Ratio(X)	0.00	0.70	0.70	0.59	0.62	0.01	0.58	0.00	0.11	0.34	0.04	0.00
Avail Cap(c_a), veh/h	378	1118	1134	506	2368	1069	1440	0	652	701	1398	469
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	12.3	12.3	19.6	6.6	4.1	18.7	0.0	17.5	22.5	22.5	0.0
Incr Delay (d2), s/veh	0.0	1.4	1.4	1.6	0.4	0.0	1.2	0.0	0.2	15.6	0.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	5.1	5.2	1.3	5.1	0.0	1.6	0.0	0.3	0.1	0.0	0.0
LnGrp Delay(d),s/veh	0.0	13.7	13.7	21.1	6.9	4.1	19.9	0.0	17.8	38.1	23.2	0.0
LnGrp LOS		B	B	C	A	A	B		B	D	C	
Approach Vol, veh/h		924			1459			289			5	
Approach Delay, s/veh		13.7			8.9			19.7			35.2	
Approach LOS		B			A			B			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		10.4	9.1	21.3		4.8	0.0	30.4
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		18.5	6.7	28.8		18.0	5.0	30.5
Max Q Clear Time (g_c+I1), s		5.2	4.6	12.1		2.3	0.0	12.7
Green Ext Time (p_c), s		0.8	0.1	4.7		0.0	0.0	7.6

Intersection Summary	
HCM 2010 Ctrl Delay	11.8
HCM 2010 LOS	B

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	84	789	26	82	1203	61	21	45	35	72	106	166
Future Volume (veh/h)	84	789	26	82	1203	61	21	45	35	72	106	166
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	89	839	13	87	1280	31	22	48	3	77	113	15
Adj No. of Lanes	1	2	1	1	2	1	1	1	1	1	1	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	136	1641	730	135	1638	729	277	260	220	328	260	220
Arrive On Green	0.08	0.46	0.46	0.08	0.46	0.46	0.14	0.14	0.14	0.14	0.14	0.14
Sat Flow, veh/h	1774	3539	1575	1774	3539	1575	1254	1863	1577	1343	1863	1577
Grp Volume(v), veh/h	89	839	13	87	1280	31	22	48	3	77	113	15
Grp Sat Flow(s),veh/h/ln	1774	1770	1575	1774	1770	1575	1254	1863	1577	1343	1863	1577
Q Serve(g_s), s	2.1	7.0	0.2	2.0	12.8	0.5	0.7	1.0	0.1	2.3	2.3	0.3
Cycle Q Clear(g_c), s	2.1	7.0	0.2	2.0	12.8	0.5	3.0	1.0	0.1	3.2	2.3	0.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	136	1641	730	135	1638	729	277	260	220	328	260	220
V/C Ratio(X)	0.65	0.51	0.02	0.65	0.78	0.04	0.08	0.18	0.01	0.23	0.43	0.07
Avail Cap(c_a), veh/h	211	1892	842	219	1909	849	661	832	704	741	832	704
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	18.9	7.9	6.1	18.9	9.5	6.2	18.0	16.0	15.6	17.4	16.6	15.7
Incr Delay (d2), s/veh	5.2	0.2	0.0	5.1	1.9	0.0	0.1	0.3	0.0	0.4	1.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	3.4	0.1	1.2	6.5	0.2	0.2	0.5	0.0	0.9	1.3	0.2
LnGrp Delay(d),s/veh	24.1	8.2	6.1	24.0	11.4	6.2	18.1	16.3	15.6	17.8	17.7	15.9
LnGrp LOS	C	A	A	C	B	A	B	B	B	B	B	B
Approach Vol, veh/h		941			1398			73			205	
Approach Delay, s/veh		9.7			12.1			16.8			17.6	
Approach LOS		A			B			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		10.4	7.7	24.0		10.4	7.7	24.0
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		18.8	5.2	22.5		18.8	5.0	22.7
Max Q Clear Time (g_c+I1), s		5.0	4.0	9.0		5.2	4.1	14.8
Green Ext Time (p_c), s		0.2	0.0	4.2		0.6	0.0	4.7

Intersection Summary			
HCM 2010 Ctrl Delay			11.8
HCM 2010 LOS			B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	94	820	29	184	1364	96	28	57	160	64	63	108
Future Volume (veh/h)	94	820	29	184	1364	96	28	57	160	64	63	108
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	100	872	26	196	1451	50	30	61	19	68	67	13
Adj No. of Lanes	1	3	0	1	2	1	1	2	0	1	2	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	135	2339	70	253	1868	835	277	322	96	276	356	67
Arrive On Green	0.08	0.46	0.46	0.14	0.53	0.53	0.12	0.12	0.12	0.12	0.12	0.12
Sat Flow, veh/h	1774	5075	151	1774	3539	1582	1311	2687	801	1311	2971	561
Grp Volume(v), veh/h	100	582	316	196	1451	50	30	39	41	68	39	41
Grp Sat Flow(s),veh/h/ln	1774	1695	1836	1774	1770	1582	1311	1770	1719	1311	1770	1762
Q Serve(g_s), s	2.7	5.5	5.5	5.2	16.0	0.8	1.0	1.0	1.0	2.4	1.0	1.0
Cycle Q Clear(g_c), s	2.7	5.5	5.5	5.2	16.0	0.8	2.1	1.0	1.0	3.5	1.0	1.0
Prop In Lane	1.00		0.08	1.00		1.00	1.00		0.47	1.00		0.32
Lane Grp Cap(c), veh/h	135	1563	846	253	1868	835	277	212	206	276	212	211
V/C Ratio(X)	0.74	0.37	0.37	0.77	0.78	0.06	0.11	0.19	0.20	0.25	0.18	0.19
Avail Cap(c_a), veh/h	200	1563	846	556	2283	1020	644	707	687	643	707	704
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	22.1	8.6	8.6	20.2	9.2	5.6	20.3	19.3	19.4	20.9	19.3	19.4
Incr Delay (d2), s/veh	7.8	0.1	0.3	5.0	1.4	0.0	0.2	0.4	0.5	0.5	0.4	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.6	2.5	2.8	2.9	8.0	0.3	0.4	0.5	0.5	0.9	0.5	0.5
LnGrp Delay(d),s/veh	29.9	8.7	8.8	25.2	10.6	5.7	20.5	19.8	19.8	21.4	19.8	19.8
LnGrp LOS	C	A	A	C	B	A	C	B	B	C	B	B
Approach Vol, veh/h		998			1697			110			148	
Approach Delay, s/veh		10.9			12.2			20.0			20.5	
Approach LOS		B			B			B			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		10.3	11.5	27.0		10.3	8.2	30.3
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		19.5	15.3	21.7		19.5	5.5	31.5
Max Q Clear Time (g_c+I1), s		4.1	7.2	7.5		5.5	4.7	18.0
Green Ext Time (p_c), s		0.3	0.3	4.3		0.4	0.0	7.7

Intersection Summary	
HCM 2010 Ctrl Delay	12.4
HCM 2010 LOS	B

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	116	932	1468	115	108	176
Future Volume (veh/h)	116	932	1468	115	108	176
Number	7	4	8	18	1	16
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1900	1863	1863
Adj Flow Rate, veh/h	123	991	1562	112	115	140
Adj No. of Lanes	1	3	3	0	2	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	299	3575	3406	244	447	206
Arrive On Green	0.70	0.70	0.70	0.70	0.13	0.13
Sat Flow, veh/h	295	5253	5012	347	3442	1583
Grp Volume(v), veh/h	123	991	1093	581	115	140
Grp Sat Flow(s),veh/h/ln	295	1695	1695	1801	1721	1583
Q Serve(g_s), s	16.9	3.9	7.6	7.6	1.6	4.5
Cycle Q Clear(g_c), s	24.5	3.9	7.6	7.6	1.6	4.5
Prop In Lane	1.00			0.19	1.00	1.00
Lane Grp Cap(c), veh/h	299	3575	2383	1266	447	206
V/C Ratio(X)	0.41	0.28	0.46	0.46	0.26	0.68
Avail Cap(c_a), veh/h	434	5904	3936	2092	1183	544
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	8.9	2.9	3.5	3.5	21.1	22.4
Incr Delay (d2), s/veh	0.9	0.0	0.1	0.3	0.3	3.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	1.8	3.5	3.8	0.8	2.2
LnGrp Delay(d),s/veh	9.8	3.0	3.6	3.8	21.4	26.3
LnGrp LOS	A	A	A	A	C	C
Approach Vol, veh/h		1114	1674		255	
Approach Delay, s/veh		3.7	3.7		24.1	
Approach LOS		A	A		C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs				4		6		8
Phs Duration (G+Y+Rc), s				42.3		11.5		42.3
Change Period (Y+Rc), s				4.5		4.5		4.5
Max Green Setting (Gmax), s				62.5		18.5		62.5
Max Q Clear Time (g_c+I1), s				26.5		6.5		9.6
Green Ext Time (p_c), s				11.3		0.6		15.0

Intersection Summary	
HCM 2010 Ctrl Delay	5.4
HCM 2010 LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	46	985	6	73	1504	406	1	3	14	333	3	77
Future Volume (veh/h)	46	985	6	73	1504	406	1	3	14	333	3	77
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1900	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	49	1048	5	78	1600	168	1	3	0	356	0	48
Adj No. of Lanes	1	3	0	1	3	1	0	1	0	2	0	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	272	2292	11	404	2311	717	6	18	0	546	0	242
Arrive On Green	0.05	0.44	0.44	0.06	0.45	0.45	0.01	0.01	0.00	0.15	0.00	0.15
Sat Flow, veh/h	1774	5223	25	1774	5085	1578	460	1380	0	3548	0	1574
Grp Volume(v), veh/h	49	680	373	78	1600	168	4	0	0	356	0	48
Grp Sat Flow(s),veh/h/ln	1774	1695	1858	1774	1695	1578	1840	0	0	1774	0	1574
Q Serve(g_s), s	0.8	7.7	7.7	1.2	13.6	3.5	0.1	0.0	0.0	5.1	0.0	1.4
Cycle Q Clear(g_c), s	0.8	7.7	7.7	1.2	13.6	3.5	0.1	0.0	0.0	5.1	0.0	1.4
Prop In Lane	1.00		0.01	1.00		1.00	0.25		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	272	1488	815	404	2311	717	24	0	0	546	0	242
V/C Ratio(X)	0.18	0.46	0.46	0.19	0.69	0.23	0.17	0.00	0.00	0.65	0.00	0.20
Avail Cap(c_a), veh/h	350	1807	990	503	2850	884	625	0	0	1174	0	521
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	9.2	10.7	10.7	7.7	11.8	9.1	26.6	0.0	0.0	21.7	0.0	20.1
Incr Delay (d2), s/veh	0.3	0.2	0.4	0.2	0.5	0.2	3.3	0.0	0.0	1.3	0.0	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	3.6	4.0	0.6	6.3	1.6	0.1	0.0	0.0	2.6	0.0	0.7
LnGrp Delay(d),s/veh	9.5	10.9	11.1	7.9	12.4	9.2	29.9	0.0	0.0	23.0	0.0	20.5
LnGrp LOS	A	B	B	A	B	A	C			C		C
Approach Vol, veh/h		1102			1846			4			404	
Approach Delay, s/veh		10.9			11.9			29.9			22.7	
Approach LOS		B			B			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		5.2	8.0	28.4		12.9	7.1	29.2
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		18.5	6.5	29.0		18.0	5.0	30.5
Max Q Clear Time (g_c+I1), s		2.1	3.2	9.7		7.1	2.8	15.6
Green Ext Time (p_c), s		0.0	0.0	5.9		1.0	0.0	9.1

Intersection Summary	
HCM 2010 Ctrl Delay	12.9
HCM 2010 LOS	B

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	173	726	454	190	1143	628	639	837	84	553	1010	169
Future Volume (veh/h)	173	726	454	190	1143	628	639	837	84	553	1010	169
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.99	1.00		0.97	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	184	772	439	202	1216	628	680	890	18	588	1074	152
Adj No. of Lanes	2	3	1	2	3	1	2	3	1	2	3	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	227	1212	704	275	1281	713	728	1422	431	691	1205	170
Arrive On Green	0.07	0.24	0.24	0.08	0.25	0.25	0.21	0.28	0.28	0.20	0.27	0.27
Sat Flow, veh/h	3442	5085	1547	3442	5085	1568	3442	5085	1541	3442	4486	634
Grp Volume(v), veh/h	184	772	439	202	1216	628	680	890	18	588	811	415
Grp Sat Flow(s),veh/h/ln	1721	1695	1547	1721	1695	1568	1721	1695	1541	1721	1695	1730
Q Serve(g_s), s	4.7	12.2	19.5	5.1	21.0	22.5	17.3	13.6	0.8	14.7	20.5	20.6
Cycle Q Clear(g_c), s	4.7	12.2	19.5	5.1	21.0	22.5	17.3	13.6	0.8	14.7	20.5	20.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.37
Lane Grp Cap(c), veh/h	227	1212	704	275	1281	713	728	1422	431	691	911	465
V/C Ratio(X)	0.81	0.64	0.62	0.74	0.95	0.88	0.93	0.63	0.04	0.85	0.89	0.89
Avail Cap(c_a), veh/h	227	1212	704	304	1281	713	728	1422	431	890	938	478
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	41.1	30.5	18.9	40.2	32.8	22.3	34.6	28.1	23.4	34.4	31.4	31.4
Incr Delay (d2), s/veh	19.2	1.1	1.7	8.1	14.7	12.3	19.0	0.9	0.0	6.3	10.5	18.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.9	5.8	8.6	2.7	11.5	16.4	10.1	6.5	0.3	7.6	10.9	12.2
LnGrp Delay(d),s/veh	60.4	31.7	20.6	48.2	47.5	34.6	53.6	29.0	23.5	40.7	41.8	49.8
LnGrp LOS	E	C	C	D	D	C	D	C	C	D	D	D
Approach Vol, veh/h		1395			2046			1588			1814	
Approach Delay, s/veh		32.0			43.6			39.4			43.3	
Approach LOS		C			D			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	22.4	29.5	11.6	25.8	23.4	28.5	10.4	27.0
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	23.1	20.5	7.9	20.5	18.9	24.7	5.9	22.5
Max Q Clear Time (g_c+I1), s	16.7	15.6	7.1	21.5	19.3	22.6	6.7	24.5
Green Ext Time (p_c), s	1.2	2.3	0.0	0.0	0.0	1.4	0.0	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	40.2
HCM 2010 LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	55	1118	188	319	1669	120	195	76	332	95	49	30
Future Volume (veh/h)	55	1118	188	319	1669	120	195	76	332	95	49	30
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.97	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	59	1189	55	339	1776	74	207	81	67	101	52	6
Adj No. of Lanes	1	3	1	1	3	1	1	1	1	1	2	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	97	1568	486	398	2432	738	405	403	337	356	691	78
Arrive On Green	0.05	0.31	0.31	0.22	0.48	0.48	0.22	0.22	0.22	0.22	0.22	0.22
Sat Flow, veh/h	1774	5085	1576	1774	5085	1542	1336	1863	1558	1232	3199	362
Grp Volume(v), veh/h	59	1189	55	339	1776	74	207	81	67	101	28	30
Grp Sat Flow(s),veh/h/ln	1774	1695	1576	1774	1695	1542	1336	1863	1558	1232	1770	1792
Q Serve(g_s), s	1.7	11.3	1.3	9.8	15.1	1.4	7.9	1.9	1.9	3.9	0.7	0.7
Cycle Q Clear(g_c), s	1.7	11.3	1.3	9.8	15.1	1.4	8.6	1.9	1.9	5.9	0.7	0.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.20
Lane Grp Cap(c), veh/h	97	1568	486	398	2432	738	405	403	337	356	382	387
V/C Ratio(X)	0.61	0.76	0.11	0.85	0.73	0.10	0.51	0.20	0.20	0.28	0.07	0.08
Avail Cap(c_a), veh/h	165	1702	527	478	2601	789	589	658	551	525	625	633
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	24.9	16.8	13.3	20.0	11.2	7.7	20.2	17.3	17.3	19.7	16.8	16.8
Incr Delay (d2), s/veh	6.1	1.9	0.1	11.9	1.0	0.1	1.0	0.2	0.3	0.4	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	5.6	0.6	6.1	7.1	0.6	3.0	1.0	0.8	1.4	0.3	0.4
LnGrp Delay(d),s/veh	31.0	18.7	13.4	31.9	12.2	7.7	21.2	17.5	17.5	20.1	16.9	16.9
LnGrp LOS	C	B	B	C	B	A	C	B	B	C	B	B
Approach Vol, veh/h		1303			2189			355			159	
Approach Delay, s/veh		19.0			15.1			19.7			18.9	
Approach LOS		B			B			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		16.1	16.6	21.1		16.1	7.4	30.2
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		19.0	14.5	18.0		19.0	5.0	27.5
Max Q Clear Time (g_c+I1), s		10.6	11.8	13.3		7.9	3.7	17.1
Green Ext Time (p_c), s		0.9	0.3	3.1		0.4	0.0	8.1

Intersection Summary	
HCM 2010 Ctrl Delay	16.9
HCM 2010 LOS	B

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1016	0	0	1364	972	166
Future Volume (veh/h)	1016	0	0	1364	972	166
Number	4	14	3	8	5	12
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	0	0	1863	1863	1900
Adj Flow Rate, veh/h	1081	0	0	1451	1182	0
Adj No. of Lanes	3	0	0	3	2	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	0	0	2	2	0
Cap, veh/h	1976	0	0	1976	1397	636
Arrive On Green	0.39	0.00	0.00	0.39	0.39	0.00
Sat Flow, veh/h	5421	0	0	5421	3548	1615
Grp Volume(v), veh/h	1081	0	0	1451	1182	0
Grp Sat Flow(s),veh/h/ln	1695	0	0	1695	1774	1615
Q Serve(g_s), s	6.8	0.0	0.0	10.1	12.5	0.0
Cycle Q Clear(g_c), s	6.8	0.0	0.0	10.1	12.5	0.0
Prop In Lane		0.00	0.00		1.00	1.00
Lane Grp Cap(c), veh/h	1976	0	0	1976	1397	636
V/C Ratio(X)	0.55	0.00	0.00	0.73	0.85	0.00
Avail Cap(c_a), veh/h	2214	0	0	2214	1545	703
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	9.8	0.0	0.0	10.8	11.4	0.0
Incr Delay (d2), s/veh	0.2	0.0	0.0	1.1	4.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.1	0.0	0.0	4.9	6.9	0.0
LnGrp Delay(d),s/veh	10.0	0.0	0.0	12.0	15.6	0.0
LnGrp LOS	B			B	B	
Approach Vol, veh/h	1081			1451	1182	
Approach Delay, s/veh	10.0			12.0	15.6	
Approach LOS	B			B	B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4				8
Phs Duration (G+Y+Rc), s		20.8		20.6				20.6
Change Period (Y+Rc), s		4.5		4.5				4.5
Max Green Setting (Gmax), s		18.0		18.0				18.0
Max Q Clear Time (g_c+I1), s		14.5		8.8				12.1
Green Ext Time (p_c), s		1.8		4.3				4.0

Intersection Summary	
HCM 2010 Ctrl Delay	12.6
HCM 2010 LOS	B

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	240	41	266	25	53	147	221	1368	53	121	1477	481
Future Volume (veh/h)	240	41	266	25	53	147	221	1368	53	121	1477	481
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.94	1.00		0.97	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	255	44	43	27	56	7	235	1455	52	129	1571	169
Adj No. of Lanes	1	1	1	1	1	1	2	3	0	1	3	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	332	349	290	107	112	90	329	1982	71	164	1985	607
Arrive On Green	0.19	0.19	0.19	0.06	0.06	0.06	0.10	0.39	0.39	0.09	0.39	0.39
Sat Flow, veh/h	1774	1863	1548	1774	1863	1494	3442	5035	180	1774	5085	1555
Grp Volume(v), veh/h	255	44	43	27	56	7	235	980	527	129	1571	169
Grp Sat Flow(s),veh/h/ln	1774	1863	1548	1774	1863	1494	1721	1695	1825	1774	1695	1555
Q Serve(g_s), s	9.2	1.3	1.6	1.0	2.0	0.3	4.5	16.6	16.6	4.8	18.4	5.0
Cycle Q Clear(g_c), s	9.2	1.3	1.6	1.0	2.0	0.3	4.5	16.6	16.6	4.8	18.4	5.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.10	1.00		1.00
Lane Grp Cap(c), veh/h	332	349	290	107	112	90	329	1334	718	164	1985	607
V/C Ratio(X)	0.77	0.13	0.15	0.25	0.50	0.08	0.71	0.73	0.73	0.79	0.79	0.28
Avail Cap(c_a), veh/h	473	497	413	473	497	398	367	1411	759	208	2169	663
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.0	22.8	22.9	30.3	30.7	29.9	29.6	17.5	17.5	30.0	18.2	14.1
Incr Delay (d2), s/veh	4.8	0.2	0.2	1.2	3.4	0.4	5.7	1.9	3.5	14.5	1.9	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.9	0.7	0.7	0.5	1.1	0.1	2.4	8.1	9.0	3.0	8.9	2.2
LnGrp Delay(d),s/veh	30.8	23.0	23.2	31.5	34.1	30.3	35.4	19.4	21.0	44.5	20.1	14.3
LnGrp LOS	C	C	C	C	C	C	D	B	C	D	C	B
Approach Vol, veh/h		342			90			1742			1869	
Approach Delay, s/veh		28.8			33.0			22.0			21.2	
Approach LOS		C			C			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	10.7	31.1		17.1	11.0	30.9		8.6
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5
Max Green Setting (Gmax), s	7.9	28.1		18.0	7.2	28.8		18.0
Max Q Clear Time (g_c+I1), s	6.8	18.6		11.2	6.5	20.4		4.0
Green Ext Time (p_c), s	0.0	5.8		0.7	0.1	5.9		0.3

Intersection Summary	
HCM 2010 Ctrl Delay	22.5
HCM 2010 LOS	C

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	165	1136	0	1747	953	0
Future Volume (veh/h)	165	1136	0	1747	953	0
Number	7	14	5	2	6	16
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	0	1863	1863	0
Adj Flow Rate, veh/h	176	1165	0	1859	1014	0
Adj No. of Lanes	1	2	0	3	3	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	0	2	2	0
Cap, veh/h	782	1229	0	2129	2129	0
Arrive On Green	0.44	0.44	0.00	0.42	0.42	0.00
Sat Flow, veh/h	1774	2787	0	5421	5421	0
Grp Volume(v), veh/h	176	1165	0	1859	1014	0
Grp Sat Flow(s),veh/h/ln	1774	1393	0	1695	1695	0
Q Serve(g_s), s	3.9	25.7	0.0	21.5	9.3	0.0
Cycle Q Clear(g_c), s	3.9	25.7	0.0	21.5	9.3	0.0
Prop In Lane	1.00	1.00	0.00			0.00
Lane Grp Cap(c), veh/h	782	1229	0	2129	2129	0
V/C Ratio(X)	0.23	0.95	0.00	0.87	0.48	0.00
Avail Cap(c_a), veh/h	789	1240	0	2183	2183	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	11.1	17.2	0.0	17.1	13.5	0.0
Incr Delay (d2), s/veh	0.1	14.8	0.0	4.2	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	12.2	0.0	10.8	4.4	0.0
LnGrp Delay(d),s/veh	11.3	32.1	0.0	21.2	13.7	0.0
LnGrp LOS	B	C		C	B	
Approach Vol, veh/h	1341			1859	1014	
Approach Delay, s/veh	29.3			21.2	13.7	
Approach LOS	C			C	B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		
Phs Duration (G+Y+Rc), s		31.3		32.7		31.3		
Change Period (Y+Rc), s		4.5		4.5		4.5		
Max Green Setting (Gmax), s		27.5		28.5		27.5		
Max Q Clear Time (g_c+I1), s		23.5		27.7		11.3		
Green Ext Time (p_c), s		3.4		0.5		5.8		

Intersection Summary		
HCM 2010 Ctrl Delay		22.0
HCM 2010 LOS		C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	124	112	61	263	127	53	139	651	221	94	458	125
Future Volume (veh/h)	124	112	61	263	127	53	139	651	221	94	458	125
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.98	1.00		0.99	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	132	119	12	280	135	13	148	693	88	100	487	45
Adj No. of Lanes	2	2	1	2	2	1	2	2	1	2	2	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	309	418	334	412	525	356	322	1004	632	273	954	558
Arrive On Green	0.09	0.12	0.12	0.12	0.15	0.15	0.09	0.28	0.28	0.08	0.27	0.27
Sat Flow, veh/h	3442	3539	1575	3442	3539	1553	3442	3539	1560	3442	3539	1544
Grp Volume(v), veh/h	132	119	12	280	135	13	148	693	88	100	487	45
Grp Sat Flow(s),veh/h/ln	1721	1770	1575	1721	1770	1553	1721	1770	1560	1721	1770	1544
Q Serve(g_s), s	1.6	1.4	0.3	3.5	1.5	0.3	1.8	7.9	1.6	1.2	5.3	0.9
Cycle Q Clear(g_c), s	1.6	1.4	0.3	3.5	1.5	0.3	1.8	7.9	1.6	1.2	5.3	0.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	309	418	334	412	525	356	322	1004	632	273	954	558
V/C Ratio(X)	0.43	0.28	0.04	0.68	0.26	0.04	0.46	0.69	0.14	0.37	0.51	0.08
Avail Cap(c_a), veh/h	435	1413	777	458	1436	756	382	1413	812	382	1413	758
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.4	18.1	14.1	19.0	17.0	13.6	19.4	14.4	8.5	19.7	14.0	9.5
Incr Delay (d2), s/veh	0.9	0.4	0.0	3.5	0.3	0.0	1.0	0.9	0.1	0.8	0.4	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.7	0.1	1.9	0.7	0.1	0.9	3.9	0.7	0.6	2.6	0.4
LnGrp Delay(d),s/veh	20.4	18.5	14.2	22.6	17.3	13.6	20.4	15.2	8.6	20.5	14.4	9.6
LnGrp LOS	C	B	B	C	B	B	C	B	A	C	B	A
Approach Vol, veh/h		263			428			929			632	
Approach Delay, s/veh		19.2			20.6			15.4			15.0	
Approach LOS		B			C			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.1	17.3	9.9	9.8	8.7	16.7	8.5	11.2
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	5.0	18.0	6.0	18.0	5.0	18.0	5.7	18.3
Max Q Clear Time (g_c+I1), s	3.2	9.9	5.5	3.4	3.8	7.3	3.6	3.5
Green Ext Time (p_c), s	0.0	2.8	0.1	0.5	0.0	2.2	0.1	0.6

Intersection Summary	
HCM 2010 Ctrl Delay	16.7
HCM 2010 LOS	B

Intersection	
Int Delay, s/veh	6.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	3	0	73	6	171	2	157	30	98	280	2
Future Vol, veh/h	1	3	0	73	6	171	2	157	30	98	280	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	3	0	78	6	182	2	167	32	104	298	2

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	788	710	299	696	695	183	300	0	0	199	0	0
Stage 1	507	507	-	187	187	-	-	-	-	-	-	-
Stage 2	281	203	-	509	508	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	309	359	741	356	366	859	1261	-	-	1373	-	-
Stage 1	548	539	-	815	745	-	-	-	-	-	-	-
Stage 2	726	733	-	547	539	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	223	326	741	328	332	859	1261	-	-	1373	-	-
Mov Cap-2 Maneuver	223	326	-	328	332	-	-	-	-	-	-	-
Stage 1	547	490	-	813	744	-	-	-	-	-	-	-
Stage 2	566	732	-	494	490	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	17.5	16.8	0.1	2
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1261	-	-	292	569	1373	-	-
HCM Lane V/C Ratio	0.002	-	-	0.015	0.467	0.076	-	-
HCM Control Delay (s)	7.9	0	-	17.5	16.8	7.8	0	-
HCM Lane LOS	A	A	-	C	C	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0	2.5	0.2	-	-

Appendix E

Opening Year (2023) with Project Conditions Peak Hour Intersection Analysis Worksheets

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	17	886	268	59	559	215	195	195	94	258	240	9
Future Volume (veh/h)	17	886	268	59	559	215	195	195	94	258	240	9
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		0.99	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	18	943	91	63	595	81	207	207	10	274	255	5
Adj No. of Lanes	1	2	1	1	3	1	2	2	1	2	2	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	39	1208	541	103	1920	590	324	444	197	402	525	10
Arrive On Green	0.02	0.34	0.34	0.06	0.38	0.38	0.09	0.13	0.13	0.12	0.15	0.15
Sat Flow, veh/h	1774	3539	1583	1774	5085	1563	3442	3539	1568	3442	3549	69
Grp Volume(v), veh/h	18	943	91	63	595	81	207	207	10	274	127	133
Grp Sat Flow(s),veh/h/ln	1774	1770	1583	1774	1695	1563	1721	1770	1568	1721	1770	1848
Q Serve(g_s), s	0.5	12.0	2.0	1.7	4.1	1.7	2.9	2.7	0.3	3.8	3.3	3.3
Cycle Q Clear(g_c), s	0.5	12.0	2.0	1.7	4.1	1.7	2.9	2.7	0.3	3.8	3.3	3.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.04
Lane Grp Cap(c), veh/h	39	1208	541	103	1920	590	324	444	197	402	262	274
V/C Ratio(X)	0.46	0.78	0.17	0.61	0.31	0.14	0.64	0.47	0.05	0.68	0.48	0.49
Avail Cap(c_a), veh/h	177	1444	646	177	2074	638	445	1338	593	514	704	736
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	24.3	14.9	11.6	23.1	11.0	10.3	21.9	20.4	19.3	21.3	19.6	19.7
Incr Delay (d2), s/veh	8.1	2.4	0.1	5.7	0.1	0.1	2.1	0.8	0.1	2.5	1.4	1.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	6.2	0.9	1.0	1.9	0.7	1.5	1.4	0.1	2.0	1.7	1.8
LnGrp Delay(d),s/veh	32.4	17.2	11.7	28.8	11.1	10.4	24.0	21.2	19.4	23.8	21.0	21.0
LnGrp LOS	C	B	B	C	B	B	C	C	B	C	C	C
Approach Vol, veh/h		1052			739			424			534	
Approach Delay, s/veh		17.0			12.5			22.5			22.5	
Approach LOS		B			B			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.4	10.8	7.4	21.7	9.2	11.9	5.6	23.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	7.5	19.0	5.0	20.5	6.5	20.0	5.0	20.5
Max Q Clear Time (g_c+I1), s	5.8	4.7	3.7	14.0	4.9	5.3	2.5	6.1
Green Ext Time (p_c), s	0.2	0.9	0.0	3.1	0.1	1.0	0.0	3.2

Intersection Summary	
HCM 2010 Ctrl Delay	17.7
HCM 2010 LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	1109	163	282	503	24	338	3	323	3	24	6
Future Volume (veh/h)	4	1109	163	282	503	24	338	3	323	3	24	6
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	4	1180	162	300	535	14	360	3	49	3	26	0
Adj No. of Lanes	2	2	0	2	2	1	2	1	0	1	2	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	18	1400	192	398	1974	932	506	13	214	55	110	58
Arrive On Green	0.01	0.45	0.45	0.12	0.56	0.56	0.14	0.14	0.14	0.03	0.03	0.00
Sat Flow, veh/h	3442	3129	428	3442	3539	1583	3548	92	1505	1774	3539	1583
Grp Volume(v), veh/h	4	666	676	300	535	14	360	0	52	3	26	0
Grp Sat Flow(s),veh/h/ln	1721	1770	1787	1721	1770	1583	1774	0	1597	1774	1770	1583
Q Serve(g_s), s	0.1	22.8	23.0	5.8	5.4	0.3	6.6	0.0	2.0	0.1	0.5	0.0
Cycle Q Clear(g_c), s	0.1	22.8	23.0	5.8	5.4	0.3	6.6	0.0	2.0	0.1	0.5	0.0
Prop In Lane	1.00		0.24	1.00		1.00	1.00		0.94	1.00		1.00
Lane Grp Cap(c), veh/h	18	792	800	398	1974	932	506	0	228	55	110	58
V/C Ratio(X)	0.22	0.84	0.85	0.75	0.27	0.02	0.71	0.00	0.23	0.05	0.24	0.00
Avail Cap(c_a), veh/h	252	919	928	463	2056	969	1002	0	451	467	932	425
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	33.9	16.7	16.8	29.3	7.9	5.8	28.0	0.0	26.0	32.1	32.3	0.0
Incr Delay (d2), s/veh	5.8	6.3	6.5	5.9	0.1	0.0	1.9	0.0	0.5	0.4	1.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	12.3	12.7	3.1	2.6	0.1	3.4	0.0	0.9	0.1	0.3	0.0
LnGrp Delay(d),s/veh	39.6	23.0	23.2	35.2	7.9	5.8	29.8	0.0	26.5	32.6	33.4	0.0
LnGrp LOS	D	C	C	D	A	A	C		C	C	C	
Approach Vol, veh/h		1346			849			412			29	
Approach Delay, s/veh		23.2			17.5			29.4			33.3	
Approach LOS		C			B			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		14.2	12.4	35.1		6.6	4.9	42.6
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		19.3	9.2	35.5		18.0	5.0	39.7
Max Q Clear Time (g_c+I1), s		8.6	7.8	25.0		2.5	2.1	7.4
Green Ext Time (p_c), s		1.1	0.2	5.6		0.1	0.0	3.3

Intersection Summary	
HCM 2010 Ctrl Delay	22.4
HCM 2010 LOS	C

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	191	1252	30	107	615	44	41	135	103	130	68	120
Future Volume (veh/h)	191	1252	30	107	615	44	41	135	103	130	68	120
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	203	1332	15	114	654	19	44	144	13	138	72	15
Adj No. of Lanes	1	2	1	1	2	1	1	1	1	1	1	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	254	1586	709	145	1369	611	378	407	346	322	407	346
Arrive On Green	0.14	0.45	0.45	0.08	0.39	0.39	0.22	0.22	0.22	0.22	0.22	0.22
Sat Flow, veh/h	1774	3539	1582	1774	3539	1581	1305	1863	1583	1225	1863	1583
Grp Volume(v), veh/h	203	1332	15	114	654	19	44	144	13	138	72	15
Grp Sat Flow(s),veh/h/ln	1774	1770	1582	1774	1770	1581	1305	1863	1583	1225	1863	1583
Q Serve(g_s), s	5.9	17.9	0.3	3.4	7.5	0.4	1.5	3.5	0.3	5.8	1.7	0.4
Cycle Q Clear(g_c), s	5.9	17.9	0.3	3.4	7.5	0.4	3.2	3.5	0.3	9.3	1.7	0.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	254	1586	709	145	1369	611	378	407	346	322	407	346
V/C Ratio(X)	0.80	0.84	0.02	0.78	0.48	0.03	0.12	0.35	0.04	0.43	0.18	0.04
Avail Cap(c_a), veh/h	360	1745	780	182	1390	621	567	676	575	498	676	575
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	22.3	13.1	8.3	24.2	12.4	10.2	18.4	17.8	16.5	21.7	17.1	16.6
Incr Delay (d2), s/veh	8.1	3.6	0.0	16.0	0.3	0.0	0.1	0.5	0.0	0.9	0.2	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.5	9.5	0.1	2.3	3.7	0.2	0.6	1.9	0.2	2.0	0.9	0.2
LnGrp Delay(d),s/veh	30.4	16.7	8.3	40.2	12.7	10.2	18.5	18.3	16.6	22.6	17.3	16.6
LnGrp LOS	C	B	A	D	B	B	B	B	B	C	B	B
Approach Vol, veh/h		1550			787			201			225	
Approach Delay, s/veh		18.4			16.6			18.2			20.5	
Approach LOS		B			B			B			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		16.3	8.9	28.6		16.3	12.2	25.3
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		19.5	5.5	26.5		19.5	10.9	21.1
Max Q Clear Time (g_c+I1), s		5.5	5.4	19.9		11.3	7.9	9.5
Green Ext Time (p_c), s		0.6	0.0	4.2		0.5	0.1	3.0

Intersection Summary	
HCM 2010 Ctrl Delay	18.1
HCM 2010 LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	40	1494	53	172	648	22	29	86	414	29	42	17
Future Volume (veh/h)	40	1494	53	172	648	22	29	86	414	29	42	17
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	43	1589	51	183	689	11	31	91	249	31	45	3
Adj No. of Lanes	1	3	0	1	2	1	1	2	0	1	2	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	79	1998	64	231	1701	761	418	387	342	210	738	49
Arrive On Green	0.04	0.39	0.39	0.13	0.48	0.48	0.22	0.22	0.22	0.22	0.22	0.22
Sat Flow, veh/h	1774	5062	162	1774	3539	1583	1350	1770	1561	1036	3370	222
Grp Volume(v), veh/h	43	1064	576	183	689	11	31	91	249	31	23	25
Grp Sat Flow(s),veh/h/ln	1774	1695	1834	1774	1770	1583	1350	1770	1561	1036	1770	1823
Q Serve(g_s), s	1.3	14.6	14.6	5.3	6.6	0.2	1.0	2.2	7.8	1.5	0.6	0.6
Cycle Q Clear(g_c), s	1.3	14.6	14.6	5.3	6.6	0.2	1.5	2.2	7.8	9.3	0.6	0.6
Prop In Lane	1.00		0.09	1.00		1.00	1.00		1.00	1.00		0.12
Lane Grp Cap(c), veh/h	79	1338	724	231	1701	761	418	387	342	210	387	399
V/C Ratio(X)	0.55	0.80	0.80	0.79	0.41	0.01	0.07	0.23	0.73	0.15	0.06	0.06
Avail Cap(c_a), veh/h	195	1447	783	320	1759	787	622	655	577	366	655	675
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	24.7	14.1	14.1	22.2	8.8	7.2	16.9	16.9	19.1	23.5	16.3	16.3
Incr Delay (d2), s/veh	5.8	3.0	5.4	8.9	0.2	0.0	0.1	0.3	3.0	0.3	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	7.3	8.4	3.2	3.2	0.1	0.4	1.1	3.6	0.4	0.3	0.3
LnGrp Delay(d),s/veh	30.5	17.0	19.4	31.2	9.0	7.2	17.0	17.3	22.1	23.8	16.4	16.4
LnGrp LOS	C	B	B	C	A	A	B	B	C	C	B	B
Approach Vol, veh/h		1683			883			371			79	
Approach Delay, s/veh		18.2			13.6			20.5			19.3	
Approach LOS		B			B			C			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		16.0	11.4	25.3		16.0	6.8	29.8
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		19.5	9.5	22.5		19.5	5.8	26.2
Max Q Clear Time (g_c+I1), s		9.8	7.3	16.6		11.3	3.3	8.6
Green Ext Time (p_c), s		1.3	0.1	4.2		0.1	0.0	3.8

Intersection Summary	
HCM 2010 Ctrl Delay	17.1
HCM 2010 LOS	B

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	76	1865	821	26	20	25
Future Volume (veh/h)	76	1865	821	26	20	25
Number	7	4	8	18	1	16
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1900	1863	1863
Adj Flow Rate, veh/h	81	1984	873	25	21	0
Adj No. of Lanes	1	3	3	0	2	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	613	3496	3493	100	92	42
Arrive On Green	0.69	0.69	0.69	0.69	0.03	0.00
Sat Flow, veh/h	618	5253	5250	145	3442	1583
Grp Volume(v), veh/h	81	1984	582	316	21	0
Grp Sat Flow(s),veh/h/ln	618	1695	1695	1837	1721	1583
Q Serve(g_s), s	1.8	6.3	2.0	2.0	0.2	0.0
Cycle Q Clear(g_c), s	3.8	6.3	2.0	2.0	0.2	0.0
Prop In Lane	1.00			0.08	1.00	1.00
Lane Grp Cap(c), veh/h	613	3496	2330	1263	92	42
V/C Ratio(X)	0.13	0.57	0.25	0.25	0.23	0.00
Avail Cap(c_a), veh/h	728	4443	2962	1605	2023	931
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	2.6	2.5	1.9	1.9	15.0	0.0
Incr Delay (d2), s/veh	0.1	0.1	0.1	0.1	1.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	2.8	0.9	1.0	0.1	0.0
LnGrp Delay(d),s/veh	2.7	2.7	1.9	2.0	16.3	0.0
LnGrp LOS	A	A	A	A	B	
Approach Vol, veh/h		2065	898		21	
Approach Delay, s/veh		2.7	1.9		16.3	
Approach LOS		A	A		B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs				4		6		8
Phs Duration (G+Y+Rc), s				26.1		5.3		26.1
Change Period (Y+Rc), s				4.5		4.5		4.5
Max Green Setting (Gmax), s				27.5		18.5		27.5
Max Q Clear Time (g_c+I1), s				8.3		2.2		4.0
Green Ext Time (p_c), s				13.3		0.0		5.2

Intersection Summary	
HCM 2010 Ctrl Delay	2.5
HCM 2010 LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	1848	3	17	809	45	13	1	13	24	0	22
Future Volume (veh/h)	30	1848	3	17	809	45	13	1	13	24	0	22
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1900	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	32	1966	3	18	861	29	14	1	0	26	0	10
Adj No. of Lanes	1	3	0	1	3	1	0	1	0	2	0	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	480	2812	4	248	2656	826	35	3	0	149	0	66
Arrive On Green	0.04	0.54	0.54	0.02	0.52	0.52	0.02	0.02	0.00	0.04	0.00	0.04
Sat Flow, veh/h	1774	5244	8	1774	5085	1582	1661	119	0	3548	0	1579
Grp Volume(v), veh/h	32	1271	698	18	861	29	15	0	0	26	0	10
Grp Sat Flow(s),veh/h/ln	1774	1695	1861	1774	1695	1582	1780	0	0	1774	0	1579
Q Serve(g_s), s	0.4	13.2	13.2	0.2	4.6	0.4	0.4	0.0	0.0	0.3	0.0	0.3
Cycle Q Clear(g_c), s	0.4	13.2	13.2	0.2	4.6	0.4	0.4	0.0	0.0	0.3	0.0	0.3
Prop In Lane	1.00		0.00	1.00		1.00	0.93		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	480	1818	998	248	2656	826	38	0	0	149	0	66
V/C Ratio(X)	0.07	0.70	0.70	0.07	0.32	0.04	0.40	0.00	0.00	0.17	0.00	0.15
Avail Cap(c_a), veh/h	602	2172	1193	395	3258	1014	692	0	0	1342	0	597
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	5.0	8.2	8.2	6.8	6.5	5.5	23.0	0.0	0.0	22.0	0.0	22.0
Incr Delay (d2), s/veh	0.1	0.8	1.5	0.1	0.1	0.0	6.6	0.0	0.0	0.5	0.0	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	6.2	7.0	0.1	2.2	0.2	0.3	0.0	0.0	0.2	0.0	0.1
LnGrp Delay(d),s/veh	5.0	9.0	9.6	6.9	6.6	5.6	29.5	0.0	0.0	22.6	0.0	23.0
LnGrp LOS	A	A	A	A	A	A	C			C		C
Approach Vol, veh/h		2001			908			15			36	
Approach Delay, s/veh		9.2			6.6			29.5			22.7	
Approach LOS		A			A			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		5.5	5.6	30.0		6.5	6.2	29.4
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		18.5	5.0	30.5		18.0	5.0	30.5
Max Q Clear Time (g_c+I1), s		2.4	2.2	15.2		2.3	2.4	6.6
Green Ext Time (p_c), s		0.0	0.0	10.3		0.0	0.0	5.5

Intersection Summary	
HCM 2010 Ctrl Delay	8.6
HCM 2010 LOS	A

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	279	1201	418	66	595	265	201	437	40	385	439	86
Future Volume (veh/h)	279	1201	418	66	595	265	201	437	40	385	439	86
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	297	1278	351	70	633	223	214	465	6	410	467	42
Adj No. of Lanes	2	3	1	2	3	1	2	3	1	2	3	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	401	1625	654	201	1330	652	323	806	251	518	1022	91
Arrive On Green	0.12	0.32	0.32	0.06	0.26	0.26	0.09	0.16	0.16	0.15	0.21	0.21
Sat Flow, veh/h	3442	5085	1582	3442	5085	1582	3442	5085	1580	3442	4755	422
Grp Volume(v), veh/h	297	1278	351	70	633	223	214	465	6	410	331	178
Grp Sat Flow(s),veh/h/ln	1721	1695	1582	1721	1695	1582	1721	1695	1580	1721	1695	1788
Q Serve(g_s), s	4.8	13.1	9.6	1.1	6.0	5.6	3.5	4.9	0.2	6.6	4.9	5.0
Cycle Q Clear(g_c), s	4.8	13.1	9.6	1.1	6.0	5.6	3.5	4.9	0.2	6.6	4.9	5.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.24
Lane Grp Cap(c), veh/h	401	1625	654	201	1330	652	323	806	251	518	729	384
V/C Ratio(X)	0.74	0.79	0.54	0.35	0.48	0.34	0.66	0.58	0.02	0.79	0.45	0.46
Avail Cap(c_a), veh/h	401	1742	691	299	1592	733	449	1627	506	533	1167	615
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	24.6	17.8	12.7	26.0	17.9	11.6	25.2	22.4	20.4	23.6	19.6	19.7
Incr Delay (d2), s/veh	7.2	2.3	0.7	1.0	0.3	0.3	2.3	0.7	0.0	7.8	0.4	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.7	6.5	4.3	0.6	2.8	2.5	1.7	2.3	0.1	3.7	2.3	2.6
LnGrp Delay(d),s/veh	31.7	20.1	13.4	27.0	18.2	11.9	27.5	23.1	20.5	31.4	20.1	20.5
LnGrp LOS	C	C	B	C	B	B	C	C	C	C	C	C
Approach Vol, veh/h		1926			926			685			919	
Approach Delay, s/veh		20.7			17.3			24.4			25.2	
Approach LOS		C			B			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.1	13.6	7.9	22.9	9.9	16.9	11.2	19.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	8.9	18.4	5.0	19.7	7.5	19.8	6.7	18.0
Max Q Clear Time (g_c+I1), s	8.6	6.9	3.1	15.1	5.5	7.0	6.8	8.0
Green Ext Time (p_c), s	0.1	2.1	0.0	3.2	0.1	2.3	0.0	3.2

Intersection Summary	
HCM 2010 Ctrl Delay	21.5
HCM 2010 LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	18	1433	170	141	857	24	79	9	141	13	7	1
Future Volume (veh/h)	18	1433	170	141	857	24	79	9	141	13	7	1
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	19	1524	85	150	912	14	84	10	12	14	7	0
Adj No. of Lanes	1	3	1	1	3	1	1	1	1	1	2	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	42	2305	718	193	2738	852	314	177	151	308	337	0
Arrive On Green	0.02	0.45	0.45	0.11	0.54	0.54	0.10	0.10	0.10	0.10	0.10	0.00
Sat Flow, veh/h	1774	5085	1583	1774	5085	1583	1403	1863	1583	1384	3632	0
Grp Volume(v), veh/h	19	1524	85	150	912	14	84	10	12	14	7	0
Grp Sat Flow(s),veh/h/ln	1774	1695	1583	1774	1695	1583	1403	1863	1583	1384	1770	0
Q Serve(g_s), s	0.4	9.2	1.2	3.2	4.0	0.2	2.3	0.2	0.3	0.4	0.1	0.0
Cycle Q Clear(g_c), s	0.4	9.2	1.2	3.2	4.0	0.2	2.3	0.2	0.3	0.6	0.1	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	42	2305	718	193	2738	852	314	177	151	308	337	0
V/C Ratio(X)	0.45	0.66	0.12	0.78	0.33	0.02	0.27	0.06	0.08	0.05	0.02	0.00
Avail Cap(c_a), veh/h	225	2645	823	338	2967	924	839	874	743	825	1661	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	19.0	8.4	6.2	17.1	5.1	4.2	17.2	16.2	16.3	16.5	16.2	0.0
Incr Delay (d2), s/veh	7.3	0.5	0.1	6.6	0.1	0.0	0.5	0.1	0.2	0.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	4.3	0.5	1.9	1.8	0.1	0.9	0.1	0.1	0.1	0.0	0.0
LnGrp Delay(d),s/veh	26.3	8.9	6.3	23.7	5.2	4.2	17.7	16.3	16.5	16.5	16.2	0.0
LnGrp LOS	C	A	A	C	A	A	B	B	B	B	B	
Approach Vol, veh/h		1628			1076			106			21	
Approach Delay, s/veh		9.0			7.8			17.4			16.4	
Approach LOS		A			A			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		8.3	8.8	22.4		8.3	5.4	25.7
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		18.5	7.5	20.5		18.5	5.0	23.0
Max Q Clear Time (g_c+I1), s		4.3	5.2	11.2		2.6	2.4	6.0
Green Ext Time (p_c), s		0.2	0.1	6.6		0.0	0.0	6.1

Intersection Summary	
HCM 2010 Ctrl Delay	8.9
HCM 2010 LOS	A

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	988	0	0	689	419	278
Future Volume (veh/h)	988	0	0	689	419	278
Number	4	14	3	8	5	12
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	0	0	1863	1863	1900
Adj Flow Rate, veh/h	1051	0	0	733	360	366
Adj No. of Lanes	3	0	0	3	1	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	0	0	2	2	0
Cap, veh/h	1939	0	0	1939	576	525
Arrive On Green	0.38	0.00	0.00	0.38	0.32	0.32
Sat Flow, veh/h	5421	0	0	5421	1774	1615
Grp Volume(v), veh/h	1051	0	0	733	360	366
Grp Sat Flow(s),veh/h/ln	1695	0	0	1695	1774	1615
Q Serve(g_s), s	4.9	0.0	0.0	3.2	5.3	6.1
Cycle Q Clear(g_c), s	4.9	0.0	0.0	3.2	5.3	6.1
Prop In Lane		0.00	0.00		1.00	1.00
Lane Grp Cap(c), veh/h	1939	0	0	1939	576	525
V/C Ratio(X)	0.54	0.00	0.00	0.38	0.62	0.70
Avail Cap(c_a), veh/h	2989	0	0	2989	1043	949
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	7.4	0.0	0.0	6.8	8.8	9.0
Incr Delay (d2), s/veh	0.2	0.0	0.0	0.1	1.1	1.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.3	0.0	0.0	1.5	2.7	2.9
LnGrp Delay(d),s/veh	7.6	0.0	0.0	7.0	9.9	10.7
LnGrp LOS	A			A	A	B
Approach Vol, veh/h	1051			733	726	
Approach Delay, s/veh	7.6			7.0	10.3	
Approach LOS	A			A	B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4				8
Phs Duration (G+Y+Rc), s		14.4		16.2				16.2
Change Period (Y+Rc), s		4.5		4.5				4.5
Max Green Setting (Gmax), s		18.0		18.0				18.0
Max Q Clear Time (g_c+I1), s		8.1		6.9				5.2
Green Ext Time (p_c), s		1.9		4.7				3.5

Intersection Summary	
HCM 2010 Ctrl Delay	8.2
HCM 2010 LOS	A

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	40	9	29	3	8	26	35	1065	14	35	943	85
Future Volume (veh/h)	40	9	29	3	8	26	35	1065	14	35	943	85
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	43	10	0	3	9	0	37	1133	14	37	1003	43
Adj No. of Lanes	1	1	1	1	1	1	2	3	0	1	3	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	105	111	94	28	29	25	148	1970	24	76	1935	602
Arrive On Green	0.06	0.06	0.00	0.02	0.02	0.00	0.04	0.38	0.38	0.04	0.38	0.38
Sat Flow, veh/h	1774	1863	1583	1774	1863	1583	3442	5178	64	1774	5085	1583
Grp Volume(v), veh/h	43	10	0	3	9	0	37	742	405	37	1003	43
Grp Sat Flow(s),veh/h/ln	1774	1863	1583	1774	1863	1583	1721	1695	1851	1774	1695	1583
Q Serve(g_s), s	0.8	0.2	0.0	0.1	0.2	0.0	0.4	6.2	6.2	0.7	5.5	0.6
Cycle Q Clear(g_c), s	0.8	0.2	0.0	0.1	0.2	0.0	0.4	6.2	6.2	0.7	5.5	0.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.03	1.00		1.00
Lane Grp Cap(c), veh/h	105	111	94	28	29	25	148	1290	704	76	1935	602
V/C Ratio(X)	0.41	0.09	0.00	0.11	0.31	0.00	0.25	0.58	0.58	0.49	0.52	0.07
Avail Cap(c_a), veh/h	890	934	794	890	934	794	479	1974	1078	252	2975	926
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	16.3	16.0	0.0	17.4	17.5	0.0	16.6	8.8	8.8	16.8	8.6	7.1
Incr Delay (d2), s/veh	2.5	0.3	0.0	1.7	5.8	0.0	0.9	0.4	0.7	4.7	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	0.1	0.0	0.0	0.1	0.0	0.2	3.0	3.3	0.4	2.5	0.3
LnGrp Delay(d),s/veh	18.8	16.3	0.0	19.1	23.3	0.0	17.5	9.2	9.6	21.5	8.8	7.1
LnGrp LOS	B	B		B	C		B	A	A	C	A	A
Approach Vol, veh/h		53			12			1184			1083	
Approach Delay, s/veh		18.3			22.2			9.6			9.2	
Approach LOS		B			C			A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	6.0	18.2		6.6	6.0	18.2		5.1
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5
Max Green Setting (Gmax), s	5.1	20.9		18.0	5.0	21.0		18.0
Max Q Clear Time (g_c+I1), s	2.7	8.2		2.8	2.4	7.5		2.2
Green Ext Time (p_c), s	0.0	5.4		0.1	0.0	5.3		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	9.7
HCM 2010 LOS	A

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	95	718	0	1136	347	0
Future Volume (veh/h)	95	718	0	1136	347	0
Number	7	14	5	2	6	16
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	0	1863	1863	0
Adj Flow Rate, veh/h	101	323	0	1209	369	0
Adj No. of Lanes	1	2	0	3	3	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	0	2	2	0
Cap, veh/h	384	603	0	2302	2302	0
Arrive On Green	0.22	0.22	0.00	0.45	0.45	0.00
Sat Flow, veh/h	1774	2787	0	5421	5421	0
Grp Volume(v), veh/h	101	323	0	1209	369	0
Grp Sat Flow(s),veh/h/ln	1774	1393	0	1695	1695	0
Q Serve(g_s), s	1.3	2.8	0.0	4.6	1.2	0.0
Cycle Q Clear(g_c), s	1.3	2.8	0.0	4.6	1.2	0.0
Prop In Lane	1.00	1.00	0.00			0.00
Lane Grp Cap(c), veh/h	384	603	0	2302	2302	0
V/C Ratio(X)	0.26	0.54	0.00	0.53	0.16	0.00
Avail Cap(c_a), veh/h	1175	1846	0	3368	3368	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	8.9	9.4	0.0	5.3	4.4	0.0
Incr Delay (d2), s/veh	0.4	0.7	0.0	0.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	1.1	0.0	2.2	0.5	0.0
LnGrp Delay(d),s/veh	9.2	10.2	0.0	5.5	4.4	0.0
LnGrp LOS	A	B		A	A	
Approach Vol, veh/h	424			1209	369	
Approach Delay, s/veh	10.0			5.5	4.4	
Approach LOS	A			A	A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		
Phs Duration (G+Y+Rc), s		16.8		10.4		16.8		
Change Period (Y+Rc), s		4.5		4.5		4.5		
Max Green Setting (Gmax), s		18.0		18.0		18.0		
Max Q Clear Time (g_c+I1), s		6.6		4.8		3.2		
Green Ext Time (p_c), s		5.7		1.3		1.8		

Intersection Summary			
HCM 2010 Ctrl Delay			6.3
HCM 2010 LOS			A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	29	54	39	99	41	10	69	415	92	41	190	36
Future Volume (veh/h)	29	54	39	99	41	10	69	415	92	41	190	36
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	31	57	8	105	44	2	73	441	32	44	202	10
Adj No. of Lanes	2	2	1	2	2	1	2	2	1	2	2	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	127	499	336	309	686	384	247	799	499	170	720	380
Arrive On Green	0.04	0.14	0.14	0.09	0.19	0.19	0.07	0.23	0.23	0.05	0.20	0.20
Sat Flow, veh/h	3442	3539	1580	3442	3539	1581	3442	3539	1581	3442	3539	1579
Grp Volume(v), veh/h	31	57	8	105	44	2	73	441	32	44	202	10
Grp Sat Flow(s),veh/h/ln	1721	1770	1580	1721	1770	1581	1721	1770	1581	1721	1770	1579
Q Serve(g_s), s	0.3	0.5	0.1	1.0	0.4	0.0	0.7	4.0	0.5	0.4	1.8	0.2
Cycle Q Clear(g_c), s	0.3	0.5	0.1	1.0	0.4	0.0	0.7	4.0	0.5	0.4	1.8	0.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	127	499	336	309	686	384	247	799	499	170	720	380
V/C Ratio(X)	0.24	0.11	0.02	0.34	0.06	0.01	0.30	0.55	0.06	0.26	0.28	0.03
Avail Cap(c_a), veh/h	472	1749	894	501	1778	872	472	1817	954	472	1817	869
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	17.0	13.7	11.3	15.6	12.0	10.4	16.0	12.5	8.7	16.7	12.3	10.6
Incr Delay (d2), s/veh	1.0	0.1	0.0	0.6	0.0	0.0	0.7	0.6	0.1	0.8	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.3	0.1	0.5	0.2	0.0	0.4	2.0	0.2	0.2	0.9	0.1
LnGrp Delay(d),s/veh	18.0	13.8	11.4	16.2	12.0	10.5	16.7	13.1	8.8	17.5	12.5	10.6
LnGrp LOS	B	B	B	B	B	B	B	B	A	B	B	B
Approach Vol, veh/h		96			151			546			256	
Approach Delay, s/veh		14.9			14.9			13.3			13.3	
Approach LOS		B			B			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.3	12.7	7.8	9.6	7.1	11.9	5.8	11.6
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	5.0	18.7	5.3	18.0	5.0	18.7	5.0	18.3
Max Q Clear Time (g_c+I1), s	2.4	6.0	3.0	2.5	2.7	3.8	2.3	2.4
Green Ext Time (p_c), s	0.0	2.1	0.1	0.2	0.0	0.9	0.0	0.1

Intersection Summary	
HCM 2010 Ctrl Delay	13.7
HCM 2010 LOS	B

Intersection	
Int Delay, s/veh	1.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	2	2	18	1	22	1	303	35	40	194	3
Future Vol, veh/h	1	2	2	18	1	22	1	303	35	40	194	3
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	2	2	19	1	23	1	322	37	43	206	3

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	649	655	208	639	638	341	209	0	0	359	0	0
Stage 1	294	294	-	343	343	-	-	-	-	-	-	-
Stage 2	355	361	-	296	295	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	383	386	832	389	394	701	1362	-	-	1200	-	-
Stage 1	714	670	-	672	637	-	-	-	-	-	-	-
Stage 2	662	626	-	712	669	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	358	370	832	374	377	701	1362	-	-	1200	-	-
Mov Cap-2 Maneuver	358	370	-	374	377	-	-	-	-	-	-	-
Stage 1	713	643	-	671	636	-	-	-	-	-	-	-
Stage 2	638	625	-	679	642	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	12.7	12.9	0	1.4
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1362	-	-	472	499	1200	-	-
HCM Lane V/C Ratio	0.001	-	-	0.011	0.087	0.035	-	-
HCM Control Delay (s)	7.6	0	-	12.7	12.9	8.1	0	-
HCM Lane LOS	A	A	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0	0.3	0.1	-	-

Intersection	
Int Delay, s/veh	3.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	113	0	16	0	347	23	10	204	0
Future Vol, veh/h	0	0	0	113	0	16	0	347	23	10	204	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	0	-	-	0	-	-	50	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	120	0	17	0	369	24	11	217	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	629	632	217	620	620	381	217	0	0	393	0	0
Stage 1	239	239	-	381	381	-	-	-	-	-	-	-
Stage 2	390	393	-	239	239	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	395	398	823	400	404	666	1353	-	-	1166	-	-
Stage 1	764	708	-	641	613	-	-	-	-	-	-	-
Stage 2	634	606	-	764	708	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	382	394	823	397	400	666	1353	-	-	1166	-	-
Mov Cap-2 Maneuver	382	394	-	397	400	-	-	-	-	-	-	-
Stage 1	764	702	-	641	613	-	-	-	-	-	-	-
Stage 2	618	606	-	757	702	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	17.1	0	0.4
HCM LOS	A	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1353	-	-	-	397	666	1166	-	-
HCM Lane V/C Ratio	-	-	-	-	0.303	0.026	0.009	-	-
HCM Control Delay (s)	0	-	-	0	18	10.5	8.1	-	-
HCM Lane LOS	A	-	-	A	C	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	-	1.3	0.1	0	-	-

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	1485	676	18	0	32
Future Vol, veh/h	0	1485	676	18	0	32
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	1580	719	19	0	34

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	369
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.32
Pot Cap-1 Maneuver	0	-	-	-	0	628
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	-	628
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	11.1
HCM LOS			B

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	628
HCM Lane V/C Ratio	-	-	-	0.054
HCM Control Delay (s)	-	-	-	11.1
HCM Lane LOS	-	-	-	B
HCM 95th %tile Q(veh)	-	-	-	0.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	535	124	95	989	307	132	115	55	297	266	28
Future Volume (veh/h)	20	535	124	95	989	307	132	115	55	297	266	28
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.98	1.00		0.96	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	21	569	37	101	1052	112	140	122	5	316	283	15
Adj No. of Lanes	1	2	1	1	3	1	2	2	1	2	2	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	45	933	406	138	1607	488	308	557	239	404	632	33
Arrive On Green	0.03	0.26	0.26	0.08	0.32	0.32	0.09	0.16	0.16	0.12	0.19	0.19
Sat Flow, veh/h	1774	3539	1542	1774	5085	1544	3442	3539	1518	3442	3415	180
Grp Volume(v), veh/h	21	569	37	101	1052	112	140	122	5	316	146	152
Grp Sat Flow(s),veh/h/ln	1774	1770	1542	1774	1695	1544	1721	1770	1518	1721	1770	1826
Q Serve(g_s), s	0.5	6.6	0.8	2.6	8.4	2.5	1.8	1.4	0.1	4.2	3.4	3.5
Cycle Q Clear(g_c), s	0.5	6.6	0.8	2.6	8.4	2.5	1.8	1.4	0.1	4.2	3.4	3.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.10
Lane Grp Cap(c), veh/h	45	933	406	138	1607	488	308	557	239	404	328	338
V/C Ratio(X)	0.46	0.61	0.09	0.73	0.65	0.23	0.45	0.22	0.02	0.78	0.45	0.45
Avail Cap(c_a), veh/h	189	1358	592	189	1952	593	367	1396	599	404	717	740
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	22.5	15.2	13.0	21.1	13.8	11.8	20.3	17.2	16.7	20.1	17.0	17.0
Incr Delay (d2), s/veh	7.2	0.6	0.1	8.8	0.6	0.2	1.1	0.2	0.0	9.6	1.0	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	3.3	0.4	1.6	4.0	1.1	0.9	0.7	0.1	2.5	1.7	1.8
LnGrp Delay(d),s/veh	29.8	15.8	13.1	30.0	14.4	12.1	21.3	17.4	16.7	29.8	17.9	17.9
LnGrp LOS	C	B	B	C	B	B	C	B	B	C	B	B
Approach Vol, veh/h		627			1265			267			614	
Approach Delay, s/veh		16.1			15.4			19.5			24.0	
Approach LOS		B			B			B			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.0	11.9	8.2	16.9	8.7	13.2	5.7	19.3
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	5.5	18.5	5.0	18.0	5.0	19.0	5.0	18.0
Max Q Clear Time (g_c+I1), s	6.2	3.4	4.6	8.6	3.8	5.5	2.5	10.4
Green Ext Time (p_c), s	0.0	0.5	0.0	2.3	0.0	1.2	0.0	3.9

Intersection Summary	
HCM 2010 Ctrl Delay	17.9
HCM 2010 LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	805	104	193	1194	8	251	2	151	4	1	3
Future Volume (veh/h)	0	805	104	193	1194	8	251	2	151	4	1	3
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	0	856	101	205	1270	5	267	2	20	4	1	0
Adj No. of Lanes	2	2	0	2	2	1	2	1	0	1	2	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	7	1200	142	345	2030	918	454	19	187	12	24	0
Arrive On Green	0.00	0.38	0.38	0.10	0.57	0.57	0.13	0.13	0.13	0.01	0.01	0.00
Sat Flow, veh/h	3442	3189	376	3442	3539	1582	3548	146	1459	1774	3539	1583
Grp Volume(v), veh/h	0	475	482	205	1270	5	267	0	22	4	1	0
Grp Sat Flow(s),veh/h/ln	1721	1770	1796	1721	1770	1582	1774	0	1605	1774	1770	1583
Q Serve(g_s), s	0.0	10.6	10.6	2.6	11.0	0.1	3.3	0.0	0.6	0.1	0.0	0.3
Cycle Q Clear(g_c), s	0.0	10.6	10.6	2.6	11.0	0.1	3.3	0.0	0.6	0.1	0.0	0.3
Prop In Lane	1.00		0.21	1.00		1.00	1.00		0.91	1.00		1.00
Lane Grp Cap(c), veh/h	7	666	675	345	2030	918	454	0	206	12	24	-143
V/C Ratio(X)	0.00	0.71	0.71	0.59	0.63	0.01	0.59	0.00	0.11	0.34	0.04	0.00
Avail Cap(c_a), veh/h	372	1101	1117	498	2332	1053	1418	0	641	690	1376	462
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	12.3	12.3	19.9	6.6	4.1	19.0	0.0	17.8	22.9	22.8	0.0
Incr Delay (d2), s/veh	0.0	1.4	1.4	1.6	0.4	0.0	1.2	0.0	0.2	15.6	0.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	5.4	5.5	1.3	5.4	0.0	1.7	0.0	0.3	0.1	0.0	0.0
LnGrp Delay(d),s/veh	0.0	13.8	13.7	21.6	7.0	4.1	20.2	0.0	18.1	38.5	23.6	0.0
LnGrp LOS		B	B	C	A	A	C		B	D	C	
Approach Vol, veh/h		957			1480			289			5	
Approach Delay, s/veh		13.7			9.0			20.1			35.5	
Approach LOS		B			A			C			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		10.4	9.1	21.9		4.8	0.0	31.1				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s		18.5	6.7	28.8		18.0	5.0	30.5				
Max Q Clear Time (g_c+I1), s		5.3	4.6	12.6		2.3	0.0	13.0				
Green Ext Time (p_c), s		0.8	0.1	4.8		0.0	0.0	7.7				
Intersection Summary												
HCM 2010 Ctrl Delay			11.9									
HCM 2010 LOS			B									
Notes												

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	114	789	26	87	1218	76	21	67	35	131	111	171
Future Volume (veh/h)	114	789	26	87	1218	76	21	67	35	131	111	171
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	121	839	12	93	1296	36	22	71	6	139	118	28
Adj No. of Lanes	1	2	1	1	2	1	1	1	1	1	1	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	155	1664	740	128	1610	716	309	353	299	350	353	299
Arrive On Green	0.09	0.47	0.47	0.07	0.45	0.45	0.19	0.19	0.19	0.19	0.19	0.19
Sat Flow, veh/h	1774	3539	1575	1774	3539	1575	1234	1863	1578	1313	1863	1578
Grp Volume(v), veh/h	121	839	12	93	1296	36	22	71	6	139	118	28
Grp Sat Flow(s),veh/h/ln	1774	1770	1575	1774	1770	1575	1234	1863	1578	1313	1863	1578
Q Serve(g_s), s	3.4	8.3	0.2	2.6	15.9	0.6	0.8	1.6	0.2	5.0	2.8	0.7
Cycle Q Clear(g_c), s	3.4	8.3	0.2	2.6	15.9	0.6	3.6	1.6	0.2	6.6	2.8	0.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	155	1664	740	128	1610	716	309	353	299	350	353	299
V/C Ratio(X)	0.78	0.50	0.02	0.73	0.80	0.05	0.07	0.20	0.02	0.40	0.33	0.09
Avail Cap(c_a), veh/h	229	1686	750	317	1862	828	529	684	580	583	684	580
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	22.5	9.3	7.1	22.9	11.8	7.7	19.2	17.2	16.6	20.0	17.7	16.8
Incr Delay (d2), s/veh	9.8	0.2	0.0	7.6	2.4	0.0	0.1	0.3	0.0	0.7	0.6	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.1	4.0	0.1	1.5	8.1	0.3	0.3	0.9	0.1	1.9	1.5	0.3
LnGrp Delay(d),s/veh	32.3	9.5	7.1	30.4	14.2	7.7	19.3	17.5	16.6	20.7	18.2	17.0
LnGrp LOS	C	A	A	C	B	A	B	B	B	C	B	B
Approach Vol, veh/h		972			1425			99			285	
Approach Delay, s/veh		12.3			15.1			17.8			19.3	
Approach LOS		B			B			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		14.1	8.1	28.2		14.1	8.9	27.4
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		18.5	9.0	24.0		18.5	6.5	26.5
Max Q Clear Time (g_c+I1), s		5.6	4.6	10.3		8.6	5.4	17.9
Green Ext Time (p_c), s		0.2	0.1	4.3		0.7	0.0	5.1

Intersection Summary	
HCM 2010 Ctrl Delay	14.6
HCM 2010 LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	94	879	29	184	1431	96	28	57	160	64	63	108
Future Volume (veh/h)	94	879	29	184	1431	96	28	57	160	64	63	108
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	100	935	27	196	1522	53	30	61	17	68	67	12
Adj No. of Lanes	1	3	0	1	2	1	1	2	0	1	2	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	130	2464	71	252	1960	876	262	320	86	262	350	61
Arrive On Green	0.07	0.49	0.49	0.14	0.55	0.55	0.12	0.12	0.12	0.12	0.12	0.12
Sat Flow, veh/h	1774	5080	147	1774	3539	1582	1312	2760	739	1313	3012	526
Grp Volume(v), veh/h	100	624	338	196	1522	53	30	38	40	68	39	40
Grp Sat Flow(s),veh/h/ln	1774	1695	1837	1774	1770	1582	1312	1770	1730	1313	1770	1768
Q Serve(g_s), s	2.9	6.1	6.1	5.6	17.7	0.8	1.1	1.0	1.1	2.6	1.0	1.1
Cycle Q Clear(g_c), s	2.9	6.1	6.1	5.6	17.7	0.8	2.2	1.0	1.1	3.7	1.0	1.1
Prop In Lane	1.00		0.08	1.00		1.00	1.00		0.43	1.00		0.30
Lane Grp Cap(c), veh/h	130	1645	891	252	1960	876	262	205	201	262	205	205
V/C Ratio(X)	0.77	0.38	0.38	0.78	0.78	0.06	0.11	0.19	0.20	0.26	0.19	0.20
Avail Cap(c_a), veh/h	220	1756	951	534	2460	1099	572	623	609	572	623	623
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	23.9	8.5	8.5	21.7	9.2	5.4	22.0	21.0	21.0	22.7	21.0	21.0
Incr Delay (d2), s/veh	9.3	0.1	0.3	5.2	1.3	0.0	0.2	0.4	0.5	0.5	0.4	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.8	2.8	3.1	3.1	8.8	0.4	0.4	0.5	0.5	1.0	0.5	0.6
LnGrp Delay(d),s/veh	33.2	8.7	8.8	26.9	10.4	5.4	22.2	21.4	21.5	23.2	21.4	21.5
LnGrp LOS	C	A	A	C	B	A	C	C	C	C	C	C
Approach Vol, veh/h		1062			1771			108			147	
Approach Delay, s/veh		11.0			12.1			21.6			22.2	
Approach LOS		B			B			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		10.6	11.9	30.0		10.6	8.3	33.6
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		18.5	15.8	27.2		18.5	6.5	36.5
Max Q Clear Time (g_c+I1), s		4.2	7.6	8.1		5.7	4.9	19.7
Green Ext Time (p_c), s		0.3	0.3	5.3		0.4	0.0	9.4

Intersection Summary	
HCM 2010 Ctrl Delay	12.6
HCM 2010 LOS	B

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	116	991	1535	115	108	176
Future Volume (veh/h)	116	991	1535	115	108	176
Number	7	4	8	18	1	16
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1900	1863	1863
Adj Flow Rate, veh/h	123	1054	1633	113	115	146
Adj No. of Lanes	1	3	3	0	2	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	279	3653	3490	241	448	206
Arrive On Green	0.72	0.72	0.72	0.72	0.13	0.13
Sat Flow, veh/h	275	5253	5025	336	3442	1583
Grp Volume(v), veh/h	123	1054	1139	607	115	146
Grp Sat Flow(s),veh/h/ln	275	1695	1695	1803	1721	1583
Q Serve(g_s), s	20.5	4.4	8.5	8.5	1.8	5.3
Cycle Q Clear(g_c), s	29.0	4.4	8.5	8.5	1.8	5.3
Prop In Lane	1.00			0.19	1.00	1.00
Lane Grp Cap(c), veh/h	279	3653	2436	1296	448	206
V/C Ratio(X)	0.44	0.29	0.47	0.47	0.26	0.71
Avail Cap(c_a), veh/h	370	5343	3562	1895	1070	492
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	9.7	3.0	3.6	3.6	23.3	24.8
Incr Delay (d2), s/veh	1.1	0.0	0.1	0.3	0.3	4.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.6	2.0	3.8	4.1	0.9	2.5
LnGrp Delay(d),s/veh	10.8	3.0	3.7	3.8	23.6	29.2
LnGrp LOS	B	A	A	A	C	C
Approach Vol, veh/h		1177	1746		261	
Approach Delay, s/veh		3.8	3.7		26.7	
Approach LOS		A	A		C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs				4		6		8
Phs Duration (G+Y+Rc), s				47.2		12.3		47.2
Change Period (Y+Rc), s				4.5		4.5		4.5
Max Green Setting (Gmax), s				62.5		18.5		62.5
Max Q Clear Time (g_c+I1), s				31.0		7.3		10.5
Green Ext Time (p_c), s				11.8		0.6		16.1

Intersection Summary	
HCM 2010 Ctrl Delay	5.7
HCM 2010 LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	46	1044	6	73	1571	406	1	3	14	333	3	77
Future Volume (veh/h)	46	1044	6	73	1571	406	1	3	14	333	3	77
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1900	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	49	1111	5	78	1671	181	1	3	0	356	0	51
Adj No. of Lanes	1	3	0	1	3	1	0	1	0	2	0	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	264	2337	11	391	2353	730	6	18	0	543	0	241
Arrive On Green	0.05	0.45	0.45	0.06	0.46	0.46	0.01	0.01	0.00	0.15	0.00	0.15
Sat Flow, veh/h	1774	5225	24	1774	5085	1578	460	1380	0	3548	0	1574
Grp Volume(v), veh/h	49	721	395	78	1671	181	4	0	0	356	0	51
Grp Sat Flow(s),veh/h/ln	1774	1695	1858	1774	1695	1578	1840	0	0	1774	0	1574
Q Serve(g_s), s	0.8	8.3	8.3	1.3	14.6	3.9	0.1	0.0	0.0	5.2	0.0	1.6
Cycle Q Clear(g_c), s	0.8	8.3	8.3	1.3	14.6	3.9	0.1	0.0	0.0	5.2	0.0	1.6
Prop In Lane	1.00		0.01	1.00		1.00	0.25		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	264	1517	831	391	2353	730	24	0	0	543	0	241
V/C Ratio(X)	0.19	0.48	0.48	0.20	0.71	0.25	0.17	0.00	0.00	0.66	0.00	0.21
Avail Cap(c_a), veh/h	339	1775	973	487	2800	869	609	0	0	1149	0	510
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	9.4	10.8	10.8	7.7	12.0	9.1	27.1	0.0	0.0	22.2	0.0	20.6
Incr Delay (d2), s/veh	0.3	0.2	0.4	0.2	0.7	0.2	3.3	0.0	0.0	1.4	0.0	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	3.9	4.3	0.6	7.0	1.7	0.1	0.0	0.0	2.7	0.0	0.7
LnGrp Delay(d),s/veh	9.7	11.0	11.2	7.9	12.6	9.2	30.5	0.0	0.0	23.5	0.0	21.0
LnGrp LOS	A	B	B	A	B	A	C			C		C
Approach Vol, veh/h		1165			1930			4			407	
Approach Delay, s/veh		11.0			12.1			30.5			23.2	
Approach LOS		B			B			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		5.2	8.0	29.4		13.0	7.2	30.2
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		18.4	6.5	29.1		18.0	5.0	30.6
Max Q Clear Time (g_c+I1), s		2.1	3.3	10.3		7.2	2.8	16.6
Green Ext Time (p_c), s		0.0	0.0	6.2		1.0	0.0	9.1

Intersection Summary	
HCM 2010 Ctrl Delay	13.1
HCM 2010 LOS	B

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	193	760	459	190	1187	628	646	837	84	553	1010	184
Future Volume (veh/h)	193	760	459	190	1187	628	646	837	84	553	1010	184
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.99	1.00		0.97	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	205	809	444	202	1263	627	687	890	20	588	1074	165
Adj No. of Lanes	2	3	1	2	3	1	2	3	1	2	3	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	235	1222	700	275	1281	706	713	1434	435	676	1202	184
Arrive On Green	0.07	0.24	0.24	0.08	0.25	0.25	0.21	0.28	0.28	0.20	0.27	0.27
Sat Flow, veh/h	3442	5085	1547	3442	5085	1568	3442	5085	1542	3442	4430	680
Grp Volume(v), veh/h	205	809	444	202	1263	627	687	890	20	588	821	418
Grp Sat Flow(s),veh/h/ln	1721	1695	1547	1721	1695	1568	1721	1695	1542	1721	1695	1720
Q Serve(g_s), s	5.3	12.8	19.9	5.1	22.1	22.5	17.7	13.6	0.8	14.8	20.8	20.9
Cycle Q Clear(g_c), s	5.3	12.8	19.9	5.1	22.1	22.5	17.7	13.6	0.8	14.8	20.8	20.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.40
Lane Grp Cap(c), veh/h	235	1222	700	275	1281	706	713	1434	435	676	920	467
V/C Ratio(X)	0.87	0.66	0.63	0.74	0.99	0.89	0.96	0.62	0.05	0.87	0.89	0.89
Avail Cap(c_a), veh/h	235	1222	700	304	1281	706	713	1434	435	770	945	479
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	41.2	30.7	19.1	40.2	33.3	22.6	35.1	27.9	23.3	34.8	31.3	31.3
Incr Delay (d2), s/veh	28.1	1.3	1.9	8.1	21.8	13.2	25.0	0.8	0.0	9.6	10.7	18.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.4	6.1	8.8	2.7	12.9	16.8	10.9	6.5	0.4	7.9	11.1	12.3
LnGrp Delay(d),s/veh	69.3	32.0	21.0	48.3	55.0	35.9	60.1	28.7	23.4	44.4	42.0	50.1
LnGrp LOS	E	C	C	D	E	D	E	C	C	D	D	D
Approach Vol, veh/h		1458			2092			1597			1827	
Approach Delay, s/veh		33.9			48.6			42.2			44.6	
Approach LOS		C			D			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	22.0	29.7	11.6	26.0	23.0	28.7	10.6	27.0
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	20.0	23.4	7.9	20.7	18.5	24.9	6.1	22.5
Max Q Clear Time (g_c+I1), s	16.8	15.6	7.1	21.9	19.7	22.9	7.3	24.5
Green Ext Time (p_c), s	0.7	3.3	0.0	0.0	0.0	1.4	0.0	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	43.0
HCM 2010 LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	55	1152	188	319	1713	120	195	76	332	95	49	30
Future Volume (veh/h)	55	1152	188	319	1713	120	195	76	332	95	49	30
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.97	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	59	1226	56	339	1822	75	207	81	67	101	52	6
Adj No. of Lanes	1	3	1	1	3	1	1	1	1	1	2	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	96	1580	490	398	2444	741	404	402	336	355	690	78
Arrive On Green	0.05	0.31	0.31	0.22	0.48	0.48	0.22	0.22	0.22	0.22	0.22	0.22
Sat Flow, veh/h	1774	5085	1576	1774	5085	1542	1336	1863	1558	1232	3199	362
Grp Volume(v), veh/h	59	1226	56	339	1822	75	207	81	67	101	28	30
Grp Sat Flow(s),veh/h/ln	1774	1695	1576	1774	1695	1542	1336	1863	1558	1232	1770	1792
Q Serve(g_s), s	1.8	11.9	1.4	9.9	15.7	1.4	7.9	1.9	1.9	4.0	0.7	0.7
Cycle Q Clear(g_c), s	1.8	11.9	1.4	9.9	15.7	1.4	8.6	1.9	1.9	5.9	0.7	0.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.20
Lane Grp Cap(c), veh/h	96	1580	490	398	2444	741	404	402	336	355	382	387
V/C Ratio(X)	0.61	0.78	0.11	0.85	0.75	0.10	0.51	0.20	0.20	0.28	0.07	0.08
Avail Cap(c_a), veh/h	164	1691	524	475	2583	783	584	654	547	521	621	629
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	25.0	16.9	13.3	20.1	11.4	7.7	20.4	17.4	17.4	19.8	16.9	16.9
Incr Delay (d2), s/veh	6.2	2.2	0.1	12.2	1.1	0.1	1.0	0.2	0.3	0.4	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	5.8	0.6	6.1	7.5	0.6	3.0	1.0	0.8	1.4	0.3	0.4
LnGrp Delay(d),s/veh	31.2	19.1	13.4	32.3	12.5	7.7	21.4	17.7	17.7	20.3	17.0	17.0
LnGrp LOS	C	B	B	C	B	A	C	B	B	C	B	B
Approach Vol, veh/h		1341			2236			355			159	
Approach Delay, s/veh		19.4			15.4			19.8			19.1	
Approach LOS		B			B			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		16.2	16.6	21.3		16.2	7.4	30.5
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		19.0	14.5	18.0		19.0	5.0	27.5
Max Q Clear Time (g_c+I1), s		10.6	11.9	13.9		7.9	3.8	17.7
Green Ext Time (p_c), s		0.9	0.3	2.9		0.4	0.0	7.8

Intersection Summary	
HCM 2010 Ctrl Delay	17.2
HCM 2010 LOS	B

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1021	0	0	1371	1009	166
Future Volume (veh/h)	1021	0	0	1371	1009	166
Number	4	14	3	8	5	12
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	0	0	1863	1863	1900
Adj Flow Rate, veh/h	1086	0	0	1459	1227	0
Adj No. of Lanes	3	0	0	3	2	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	0	0	2	2	0
Cap, veh/h	1913	0	0	1913	1494	680
Arrive On Green	0.38	0.00	0.00	0.38	0.42	0.00
Sat Flow, veh/h	5421	0	0	5421	3548	1615
Grp Volume(v), veh/h	1086	0	0	1459	1227	0
Grp Sat Flow(s),veh/h/ln	1695	0	0	1695	1774	1615
Q Serve(g_s), s	7.5	0.0	0.0	11.1	13.6	0.0
Cycle Q Clear(g_c), s	7.5	0.0	0.0	11.1	13.6	0.0
Prop In Lane		0.00	0.00		1.00	1.00
Lane Grp Cap(c), veh/h	1913	0	0	1913	1494	680
V/C Ratio(X)	0.57	0.00	0.00	0.76	0.82	0.00
Avail Cap(c_a), veh/h	2096	0	0	2096	1814	826
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	11.0	0.0	0.0	12.1	11.4	0.0
Incr Delay (d2), s/veh	0.3	0.0	0.0	1.6	2.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.6	0.0	0.0	5.4	7.0	0.0
LnGrp Delay(d),s/veh	11.3	0.0	0.0	13.7	14.0	0.0
LnGrp LOS	B			B	B	
Approach Vol, veh/h	1086			1459	1227	
Approach Delay, s/veh	11.3			13.7	14.0	
Approach LOS	B			B	B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4				8
Phs Duration (G+Y+Rc), s		23.2		21.2				21.2
Change Period (Y+Rc), s		4.5		4.5				4.5
Max Green Setting (Gmax), s		22.7		18.3				18.3
Max Q Clear Time (g_c+I1), s		15.6		9.5				13.1
Green Ext Time (p_c), s		3.1		4.2				3.6

Intersection Summary		
HCM 2010 Ctrl Delay		13.1
HCM 2010 LOS		B

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	240	41	266	25	53	147	221	1388	53	121	1492	481
Future Volume (veh/h)	240	41	266	25	53	147	221	1388	53	121	1492	481
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.94	1.00		0.97	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	255	44	43	27	56	7	235	1477	52	129	1587	172
Adj No. of Lanes	1	1	1	1	1	1	2	3	0	1	3	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	331	348	289	107	112	90	327	1995	70	163	1998	611
Arrive On Green	0.19	0.19	0.19	0.06	0.06	0.06	0.10	0.40	0.40	0.09	0.39	0.39
Sat Flow, veh/h	1774	1863	1548	1774	1863	1493	3442	5038	177	1774	5085	1555
Grp Volume(v), veh/h	255	44	43	27	56	7	235	994	535	129	1587	172
Grp Sat Flow(s),veh/h/ln	1774	1863	1548	1774	1863	1493	1721	1695	1825	1774	1695	1555
Q Serve(g_s), s	9.3	1.3	1.6	1.0	2.0	0.3	4.5	17.0	17.0	4.8	18.7	5.1
Cycle Q Clear(g_c), s	9.3	1.3	1.6	1.0	2.0	0.3	4.5	17.0	17.0	4.8	18.7	5.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.10	1.00		1.00
Lane Grp Cap(c), veh/h	331	348	289	107	112	90	327	1343	723	163	1998	611
V/C Ratio(X)	0.77	0.13	0.15	0.25	0.50	0.08	0.72	0.74	0.74	0.79	0.79	0.28
Avail Cap(c_a), veh/h	470	494	410	470	494	396	350	1422	766	196	2178	666
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.2	23.0	23.1	30.5	30.9	30.1	29.9	17.5	17.5	30.2	18.2	14.1
Incr Delay (d2), s/veh	4.9	0.2	0.2	1.2	3.4	0.4	6.5	2.0	3.6	16.4	2.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.0	0.7	0.7	0.5	1.1	0.1	2.4	8.2	9.2	3.1	9.0	2.2
LnGrp Delay(d),s/veh	31.1	23.2	23.3	31.7	34.4	30.5	36.3	19.5	21.2	46.6	20.1	14.3
LnGrp LOS	C	C	C	C	C	C	D	B	C	D	C	B
Approach Vol, veh/h		342			90			1764			1888	
Approach Delay, s/veh		29.1			33.3			22.3			21.4	
Approach LOS		C			C			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	10.8	31.4		17.2	11.0	31.2		8.6
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5
Max Green Setting (Gmax), s	7.5	28.5		18.0	6.9	29.1		18.0
Max Q Clear Time (g_c+I1), s	6.8	19.0		11.3	6.5	20.7		4.0
Green Ext Time (p_c), s	0.0	5.9		0.7	0.0	6.0		0.3

Intersection Summary	
HCM 2010 Ctrl Delay	22.7
HCM 2010 LOS	C

Movement	EBL	EBR	NBL	NBT	SBT	SBR		
Lane Configurations								
Traffic Volume (veh/h)	172	1151	0	1767	953	0		
Future Volume (veh/h)	172	1151	0	1767	953	0		
Number	7	14	5	2	6	16		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	1863	1863	0	1863	1863	0		
Adj Flow Rate, veh/h	183	1181	0	1880	1014	0		
Adj No. of Lanes	1	2	0	3	3	0		
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94		
Percent Heavy Veh, %	2	2	0	2	2	0		
Cap, veh/h	798	1253	0	2133	2133	0		
Arrive On Green	0.45	0.45	0.00	0.42	0.42	0.00		
Sat Flow, veh/h	1774	2787	0	5421	5421	0		
Grp Volume(v), veh/h	183	1181	0	1880	1014	0		
Grp Sat Flow(s),veh/h/ln	1774	1393	0	1695	1695	0		
Q Serve(g_s), s	4.3	27.8	0.0	23.4	9.9	0.0		
Cycle Q Clear(g_c), s	4.3	27.8	0.0	23.4	9.9	0.0		
Prop In Lane	1.00	1.00	0.00			0.00		
Lane Grp Cap(c), veh/h	798	1253	0	2133	2133	0		
V/C Ratio(X)	0.23	0.94	0.00	0.88	0.48	0.00		
Avail Cap(c_a), veh/h	813	1277	0	2183	2183	0		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00		
Uniform Delay (d), s/veh	11.6	18.1	0.0	18.4	14.5	0.0		
Incr Delay (d2), s/veh	0.1	13.6	0.0	4.5	0.2	0.0		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	2.2	13.0	0.0	11.7	4.6	0.0		
LnGrp Delay(d),s/veh	11.7	31.7	0.0	22.9	14.6	0.0		
LnGrp LOS	B	C		C	B			
Approach Vol, veh/h	1364			1880	1014			
Approach Delay, s/veh	29.0			22.9	14.6			
Approach LOS	C			C	B			
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		
Phs Duration (G+Y+Rc), s		33.3		35.4		33.3		
Change Period (Y+Rc), s		4.5		4.5		4.5		
Max Green Setting (Gmax), s		29.5		31.5		29.5		
Max Q Clear Time (g_c+I1), s		25.4		29.8		11.9		
Green Ext Time (p_c), s		3.4		1.1		6.0		

Intersection Summary		
HCM 2010 Ctrl Delay		22.9
HCM 2010 LOS		C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	124	112	61	263	127	53	146	651	221	94	458	125
Future Volume (veh/h)	124	112	61	263	127	53	146	651	221	94	458	125
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.98	1.00		0.99	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	132	119	12	280	135	13	155	693	88	100	487	45
Adj No. of Lanes	2	2	1	2	2	1	2	2	1	2	2	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	309	418	336	412	525	356	327	1004	632	273	949	556
Arrive On Green	0.09	0.12	0.12	0.12	0.15	0.15	0.09	0.28	0.28	0.08	0.27	0.27
Sat Flow, veh/h	3442	3539	1575	3442	3539	1553	3442	3539	1560	3442	3539	1544
Grp Volume(v), veh/h	132	119	12	280	135	13	155	693	88	100	487	45
Grp Sat Flow(s),veh/h/ln	1721	1770	1575	1721	1770	1553	1721	1770	1560	1721	1770	1544
Q Serve(g_s), s	1.6	1.4	0.3	3.5	1.5	0.3	1.9	7.9	1.6	1.2	5.3	0.9
Cycle Q Clear(g_c), s	1.6	1.4	0.3	3.5	1.5	0.3	1.9	7.9	1.6	1.2	5.3	0.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	309	418	336	412	525	356	327	1004	632	273	949	556
V/C Ratio(X)	0.43	0.28	0.04	0.68	0.26	0.04	0.47	0.69	0.14	0.37	0.51	0.08
Avail Cap(c_a), veh/h	435	1413	779	458	1436	756	382	1413	812	382	1413	758
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.4	18.1	14.1	19.0	17.0	13.6	19.3	14.4	8.5	19.7	14.0	9.6
Incr Delay (d2), s/veh	0.9	0.4	0.0	3.5	0.3	0.0	1.1	0.9	0.1	0.8	0.4	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.7	0.1	1.9	0.7	0.1	1.0	3.9	0.7	0.6	2.6	0.4
LnGrp Delay(d),s/veh	20.4	18.5	14.1	22.6	17.3	13.6	20.4	15.2	8.6	20.5	14.4	9.6
LnGrp LOS	C	B	B	C	B	B	C	B	A	C	B	A
Approach Vol, veh/h		263			428			936			632	
Approach Delay, s/veh		19.2			20.6			15.5			15.1	
Approach LOS		B			C			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.1	17.3	9.9	9.8	8.8	16.6	8.5	11.2
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	5.0	18.0	6.0	18.0	5.0	18.0	5.7	18.3
Max Q Clear Time (g_c+I1), s	3.2	9.9	5.5	3.4	3.9	7.3	3.6	3.5
Green Ext Time (p_c), s	0.0	2.8	0.1	0.5	0.0	2.2	0.1	0.6

Intersection Summary	
HCM 2010 Ctrl Delay	16.8
HCM 2010 LOS	B

Intersection	
Int Delay, s/veh	6.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	3	0	88	6	171	2	157	30	98	280	2
Future Vol, veh/h	1	3	0	88	6	171	2	157	30	98	280	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	3	0	94	6	182	2	167	32	104	298	2

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	788	710	299	696	695	183	300	0	0	199	0	0
Stage 1	507	507	-	187	187	-	-	-	-	-	-	-
Stage 2	281	203	-	509	508	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	309	359	741	356	366	859	1261	-	-	1373	-	-
Stage 1	548	539	-	815	745	-	-	-	-	-	-	-
Stage 2	726	733	-	547	539	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	223	326	741	328	332	859	1261	-	-	1373	-	-
Mov Cap-2 Maneuver	223	326	-	328	332	-	-	-	-	-	-	-
Stage 1	547	490	-	813	744	-	-	-	-	-	-	-
Stage 2	566	732	-	494	490	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	17.5	18.4	0.1	2
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1261	-	-	292	546	1373	-	-
HCM Lane V/C Ratio	0.002	-	-	0.015	0.516	0.076	-	-
HCM Control Delay (s)	7.9	0	-	17.5	18.4	7.8	0	-
HCM Lane LOS	A	A	-	C	C	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0	2.9	0.2	-	-

Intersection	
Int Delay, s/veh	2.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	69	0	10	0	190	67	30	194	0
Future Vol, veh/h	0	0	0	69	0	10	0	190	67	30	194	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	0	-	-	0	-	-	50	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	73	0	11	0	202	71	32	206	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	513	543	206	508	508	238	206	0	0	273	0	0
Stage 1	270	270	-	238	238	-	-	-	-	-	-	-
Stage 2	243	273	-	270	270	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	472	447	835	475	468	801	1365	-	-	1290	-	-
Stage 1	736	686	-	765	708	-	-	-	-	-	-	-
Stage 2	761	684	-	736	686	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	457	436	835	466	456	801	1365	-	-	1290	-	-
Mov Cap-2 Maneuver	457	436	-	466	456	-	-	-	-	-	-	-
Stage 1	736	669	-	765	708	-	-	-	-	-	-	-
Stage 2	751	684	-	718	669	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	13.6	0	1.1
HCM LOS	A	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1365	-	-	-	466	801	1290	-	-
HCM Lane V/C Ratio	-	-	-	-	0.158	0.013	0.025	-	-
HCM Control Delay (s)	0	-	-	0	14.2	9.6	7.9	-	-
HCM Lane LOS	A	-	-	A	B	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	-	0.6	0	0.1	-	-

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	955	1515	52	0	20
Future Vol, veh/h	0	955	1515	52	0	20
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	1016	1612	55	0	21

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	834
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.32
Pot Cap-1 Maneuver	0	-	-	-	0	311
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	-	311
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	17.4
HCM LOS			C

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	311
HCM Lane V/C Ratio	-	-	-	0.068
HCM Control Delay (s)	-	-	-	17.4
HCM Lane LOS	-	-	-	C
HCM 95th %tile Q(veh)	-	-	-	0.2

APPENDIX F

BUILDOUT (2040) CONDITIONS PEAK HOUR INTERSECTION ANALYSIS WORKSHEETS

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	23	1225	375	81	737	301	273	273	131	361	335	12
Future Volume (veh/h)	23	1225	375	81	737	301	273	273	131	361	335	12
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		0.99	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	24	1303	162	86	784	143	290	290	22	384	356	10
Adj No. of Lanes	1	2	1	1	3	1	2	2	1	2	2	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	47	1520	680	110	2366	728	382	462	205	474	553	15
Arrive On Green	0.03	0.43	0.43	0.06	0.47	0.47	0.11	0.13	0.13	0.14	0.16	0.16
Sat Flow, veh/h	1774	3539	1583	1774	5085	1564	3442	3539	1569	3442	3514	98
Grp Volume(v), veh/h	24	1303	162	86	784	143	290	290	22	384	179	187
Grp Sat Flow(s),veh/h/ln	1774	1770	1583	1774	1695	1564	1721	1770	1569	1721	1770	1843
Q Serve(g_s), s	1.0	24.9	4.9	3.6	7.3	4.0	6.1	5.8	0.9	8.1	7.1	7.1
Cycle Q Clear(g_c), s	1.0	24.9	4.9	3.6	7.3	4.0	6.1	5.8	0.9	8.1	7.1	7.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.05
Lane Grp Cap(c), veh/h	47	1520	680	110	2366	728	382	462	205	474	278	290
V/C Ratio(X)	0.52	0.86	0.24	0.78	0.33	0.20	0.76	0.63	0.11	0.81	0.64	0.65
Avail Cap(c_a), veh/h	130	1677	750	130	2409	741	468	921	408	528	491	511
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	36.0	19.3	13.6	34.6	12.7	11.8	32.3	30.9	28.7	31.4	29.6	29.6
Incr Delay (d2), s/veh	8.6	4.3	0.2	22.3	0.1	0.1	5.7	1.4	0.2	8.4	2.5	2.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	13.0	2.1	2.4	3.4	1.7	3.2	2.9	0.4	4.4	3.7	3.8
LnGrp Delay(d),s/veh	44.6	23.6	13.8	56.9	12.7	11.9	38.0	32.3	29.0	39.8	32.1	32.0
LnGrp LOS	D	C	B	E	B	B	D	C	C	D	C	C
Approach Vol, veh/h		1489			1013			602			750	
Approach Delay, s/veh		22.9			16.4			34.9			36.0	
Approach LOS		C			B			C			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.8	14.3	9.1	36.7	12.8	16.3	6.5	39.4
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	11.5	19.5	5.5	35.5	10.2	20.8	5.5	35.5
Max Q Clear Time (g_c+I1), s	10.1	7.8	5.6	26.9	8.1	9.1	3.0	9.3
Green Ext Time (p_c), s	0.2	1.2	0.0	5.3	0.2	1.4	0.0	5.5

Intersection Summary	
HCM 2010 Ctrl Delay	25.6
HCM 2010 LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	6	1538	228	394	660	34	473	4	452	4	34	7
Future Volume (veh/h)	6	1538	228	394	660	34	473	4	452	4	34	7
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	6	1636	236	419	702	22	503	4	212	4	36	0
Adj No. of Lanes	2	2	0	2	2	1	2	1	0	1	2	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	26	1651	233	425	2287	1071	613	5	269	53	106	59
Arrive On Green	0.01	0.53	0.53	0.12	0.65	0.65	0.17	0.17	0.17	0.03	0.03	0.00
Sat Flow, veh/h	3442	3114	440	3442	3539	1583	3548	29	1558	1774	3539	1583
Grp Volume(v), veh/h	6	915	957	419	702	22	503	0	216	4	36	0
Grp Sat Flow(s),veh/h/ln	1721	1770	1785	1721	1770	1583	1774	0	1588	1774	1770	1583
Q Serve(g_s), s	0.2	63.1	66.5	15.2	11.0	0.6	17.1	0.0	16.3	0.3	1.3	0.0
Cycle Q Clear(g_c), s	0.2	63.1	66.5	15.2	11.0	0.6	17.1	0.0	16.3	0.3	1.3	0.0
Prop In Lane	1.00		0.25	1.00		1.00	1.00		0.98	1.00		1.00
Lane Grp Cap(c), veh/h	26	938	946	425	2287	1071	613	0	274	53	106	59
V/C Ratio(X)	0.23	0.98	1.01	0.99	0.31	0.02	0.82	0.00	0.79	0.08	0.34	0.00
Avail Cap(c_a), veh/h	137	938	946	425	2287	1071	905	0	405	255	508	239
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	61.9	28.7	29.5	54.8	9.8	6.7	50.0	0.0	49.7	59.1	59.6	0.0
Incr Delay (d2), s/veh	4.5	23.4	32.0	39.6	0.1	0.0	3.9	0.0	6.1	0.6	1.9	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	36.9	41.0	9.6	5.4	0.3	8.7	0.0	7.6	0.1	0.6	0.0
LnGrp Delay(d),s/veh	66.4	52.1	61.5	94.4	9.9	6.7	53.9	0.0	55.8	59.7	61.5	0.0
LnGrp LOS	E	D	F	F	A	A	D		E	E	E	
Approach Vol, veh/h		1878			1143			719			40	
Approach Delay, s/veh		56.9			40.8			54.5			61.3	
Approach LOS		E			D			D			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		26.2	20.0	71.0		8.3	5.4	85.6
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		32.0	15.5	66.5		18.0	5.0	77.0
Max Q Clear Time (g_c+I1), s		19.1	17.2	68.5		3.3	2.2	13.0
Green Ext Time (p_c), s		2.5	0.0	0.0		0.1	0.0	4.7

Intersection Summary	
HCM 2010 Ctrl Delay	51.6
HCM 2010 LOS	D

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	253	1753	41	139	827	54	57	177	143	46	83	156
Future Volume (veh/h)	253	1753	41	139	827	54	57	177	143	46	83	156
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	269	1865	24	148	880	25	61	188	17	49	88	18
Adj No. of Lanes	1	2	1	1	2	1	1	1	1	1	1	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	314	2023	904	182	1759	786	242	302	257	167	302	257
Arrive On Green	0.18	0.57	0.57	0.10	0.50	0.50	0.16	0.16	0.16	0.16	0.16	0.16
Sat Flow, veh/h	1774	3539	1582	1774	3539	1582	1283	1863	1583	1172	1863	1583
Grp Volume(v), veh/h	269	1865	24	148	880	25	61	188	17	49	88	18
Grp Sat Flow(s),veh/h/ln	1774	1770	1582	1774	1770	1582	1283	1863	1583	1172	1863	1583
Q Serve(g_s), s	12.1	39.3	0.5	6.7	13.7	0.7	3.6	7.7	0.7	3.3	3.4	0.8
Cycle Q Clear(g_c), s	12.1	39.3	0.5	6.7	13.7	0.7	7.0	7.7	0.7	11.1	3.4	0.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	314	2023	904	182	1759	786	242	302	257	167	302	257
V/C Ratio(X)	0.86	0.92	0.03	0.81	0.50	0.03	0.25	0.62	0.07	0.29	0.29	0.07
Avail Cap(c_a), veh/h	498	2084	931	183	1759	786	338	441	375	255	441	375
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.9	16.0	7.7	36.2	13.9	10.6	33.4	32.2	29.2	37.3	30.3	29.2
Incr Delay (d2), s/veh	8.5	7.3	0.0	23.7	0.2	0.0	0.5	2.1	0.1	1.0	0.5	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.6	21.0	0.2	4.5	6.7	0.3	1.3	4.1	0.3	1.1	1.8	0.4
LnGrp Delay(d),s/veh	41.4	23.3	7.7	59.9	14.1	10.6	34.0	34.2	29.3	38.3	30.9	29.4
LnGrp LOS	D	C	A	E	B	B	C	C	C	D	C	C
Approach Vol, veh/h		2158			1053			266			155	
Approach Delay, s/veh		25.4			20.5			33.9			33.0	
Approach LOS		C			C			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		17.9	12.9	51.6		17.9	19.1	45.4
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		19.5	8.5	48.5		19.5	23.1	33.9
Max Q Clear Time (g_c+I1), s		9.7	8.7	41.3		13.1	14.1	15.7
Green Ext Time (p_c), s		0.8	0.0	5.8		0.3	0.5	5.1

Intersection Summary		
HCM 2010 Ctrl Delay		24.9
HCM 2010 LOS		C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	55	1955	74	241	875	30	40	120	579	40	58	23
Future Volume (veh/h)	55	1955	74	241	875	30	40	120	579	40	58	23
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	59	2080	75	256	931	17	43	128	417	43	62	4
Adj No. of Lanes	1	3	0	1	2	1	1	2	0	1	2	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	77	2226	80	291	1991	891	384	429	378	81	818	52
Arrive On Green	0.04	0.44	0.44	0.16	0.56	0.56	0.24	0.24	0.24	0.24	0.24	0.24
Sat Flow, veh/h	1774	5040	181	1774	3539	1583	1329	1770	1561	858	3378	216
Grp Volume(v), veh/h	59	1397	758	256	931	17	43	128	417	43	32	34
Grp Sat Flow(s),veh/h/ln	1774	1695	1831	1774	1770	1583	1329	1770	1561	858	1770	1824
Q Serve(g_s), s	2.9	34.8	35.0	12.5	13.9	0.4	2.3	5.2	21.5	0.0	1.2	1.3
Cycle Q Clear(g_c), s	2.9	34.8	35.0	12.5	13.9	0.4	3.6	5.2	21.5	21.5	1.2	1.3
Prop In Lane	1.00		0.10	1.00		1.00	1.00		1.00	1.00		0.12
Lane Grp Cap(c), veh/h	77	1498	809	291	1991	891	384	429	378	81	429	442
V/C Ratio(X)	0.77	0.93	0.94	0.88	0.47	0.02	0.11	0.30	1.10	0.53	0.08	0.08
Avail Cap(c_a), veh/h	148	1508	815	310	1991	891	384	429	378	81	429	442
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	42.0	23.5	23.6	36.3	11.5	8.6	27.4	27.5	33.6	44.4	26.0	26.0
Incr Delay (d2), s/veh	14.9	10.9	18.0	23.1	0.2	0.0	0.1	0.4	77.1	6.4	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.7	18.4	21.5	8.0	6.8	0.2	0.8	2.6	17.2	1.2	0.6	0.6
LnGrp Delay(d),s/veh	56.9	34.4	41.6	59.3	11.7	8.6	27.5	27.9	110.7	50.8	26.0	26.0
LnGrp LOS	E	C	D	E	B	A	C	C	F	D	C	C
Approach Vol, veh/h		2214			1204			588			109	
Approach Delay, s/veh		37.5			21.8			86.6			35.8	
Approach LOS		D			C			F			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		26.0	19.1	43.7		26.0	8.3	54.5				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s		21.5	15.5	39.5		21.5	7.4	47.6				
Max Q Clear Time (g_c+I1), s		23.5	14.5	37.0		23.5	4.9	15.9				
Green Ext Time (p_c), s		0.0	0.1	2.2		0.0	0.0	6.4				
Intersection Summary												
HCM 2010 Ctrl Delay			39.9									
HCM 2010 LOS			D									

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	106	2475	1117	37	27	35
Future Volume (veh/h)	106	2475	1117	37	27	35
Number	7	4	8	18	1	16
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1900	1863	1863
Adj Flow Rate, veh/h	113	2633	1188	37	29	0
Adj No. of Lanes	1	3	3	0	2	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	479	3780	3767	117	118	54
Arrive On Green	0.74	0.74	0.74	0.74	0.03	0.00
Sat Flow, veh/h	453	5253	5235	158	3442	1583
Grp Volume(v), veh/h	113	2633	795	430	29	0
Grp Sat Flow(s),veh/h/ln	453	1695	1695	1835	1721	1583
Q Serve(g_s), s	4.5	11.2	3.2	3.2	0.3	0.0
Cycle Q Clear(g_c), s	7.7	11.2	3.2	3.2	0.3	0.0
Prop In Lane	1.00			0.09	1.00	1.00
Lane Grp Cap(c), veh/h	479	3780	2520	1364	118	54
V/C Ratio(X)	0.24	0.70	0.32	0.32	0.25	0.00
Avail Cap(c_a), veh/h	506	4081	2721	1473	1572	723
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	3.0	2.8	1.7	1.7	19.0	0.0
Incr Delay (d2), s/veh	0.3	0.5	0.1	0.1	1.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	5.0	1.5	1.6	0.2	0.0
LnGrp Delay(d),s/veh	3.3	3.2	1.8	1.9	20.1	0.0
LnGrp LOS	A	A	A	A	C	
Approach Vol, veh/h		2746	1225		29	
Approach Delay, s/veh		3.2	1.8		20.1	
Approach LOS		A	A		C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs				4		6		8
Phs Duration (G+Y+Rc), s				34.6		5.9		34.6
Change Period (Y+Rc), s				4.5		4.5		4.5
Max Green Setting (Gmax), s				32.5		18.5		32.5
Max Q Clear Time (g_c+I1), s				13.2		2.3		5.2
Green Ext Time (p_c), s				16.9		0.0		8.0

Intersection Summary		
HCM 2010 Ctrl Delay		2.9
HCM 2010 LOS		A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	41	2451	4	23	1100	63	18	1	18	34	0	30
Future Volume (veh/h)	41	2451	4	23	1100	63	18	1	18	34	0	30
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1900	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	44	2607	4	24	1170	45	19	1	0	36	0	0
Adj No. of Lanes	1	3	0	1	3	1	0	1	0	2	0	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	422	3534	5	183	3358	1045	42	2	0	132	0	59
Arrive On Green	0.04	0.67	0.67	0.03	0.66	0.66	0.02	0.02	0.00	0.04	0.00	0.00
Sat Flow, veh/h	1774	5243	8	1774	5085	1582	1689	89	0	3548	0	1583
Grp Volume(v), veh/h	44	1685	926	24	1170	45	20	0	0	36	0	0
Grp Sat Flow(s),veh/h/ln	1774	1695	1861	1774	1695	1582	1778	0	0	1774	0	1583
Q Serve(g_s), s	0.6	24.4	24.4	0.3	7.7	0.8	0.8	0.0	0.0	0.7	0.0	0.0
Cycle Q Clear(g_c), s	0.6	24.4	24.4	0.3	7.7	0.8	0.8	0.0	0.0	0.7	0.0	0.0
Prop In Lane	1.00		0.00	1.00		1.00	0.95		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	422	2285	1255	183	3358	1045	44	0	0	132	0	59
V/C Ratio(X)	0.10	0.74	0.74	0.13	0.35	0.04	0.45	0.00	0.00	0.27	0.00	0.00
Avail Cap(c_a), veh/h	470	2708	1487	253	4055	1261	434	0	0	843	0	376
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	3.9	8.0	8.0	8.3	5.7	4.5	36.4	0.0	0.0	35.5	0.0	0.0
Incr Delay (d2), s/veh	0.1	0.9	1.6	0.3	0.1	0.0	7.0	0.0	0.0	1.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	11.5	12.9	0.2	3.6	0.3	0.5	0.0	0.0	0.4	0.0	0.0
LnGrp Delay(d),s/veh	4.0	8.9	9.6	8.6	5.7	4.5	43.4	0.0	0.0	36.6	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	D			D		
Approach Vol, veh/h		2655			1239			20			36	
Approach Delay, s/veh		9.1			5.7			43.4			36.6	
Approach LOS		A			A			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		6.4	6.5	55.6		7.3	7.5	54.5
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		18.5	5.0	60.5		18.0	5.1	60.4
Max Q Clear Time (g_c+I1), s		2.8	2.3	26.4		2.7	2.6	9.7
Green Ext Time (p_c), s		0.0	0.0	24.6		0.0	0.0	9.3

Intersection Summary	
HCM 2010 Ctrl Delay	8.5
HCM 2010 LOS	A

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	346	1601	573	92	811	371	276	612	55	539	615	112
Future Volume (veh/h)	346	1601	573	92	811	371	276	612	55	539	615	112
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	368	1703	572	98	863	322	294	651	8	573	654	88
Adj No. of Lanes	2	3	1	2	3	1	2	3	1	2	3	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	450	1887	764	184	1494	761	385	883	274	645	1131	151
Arrive On Green	0.13	0.37	0.37	0.05	0.29	0.29	0.11	0.17	0.17	0.19	0.25	0.25
Sat Flow, veh/h	3442	5085	1582	3442	5085	1582	3442	5085	1581	3442	4541	605
Grp Volume(v), veh/h	368	1703	572	98	863	322	294	651	8	573	487	255
Grp Sat Flow(s),veh/h/ln	1721	1695	1582	1721	1695	1582	1721	1695	1581	1721	1695	1755
Q Serve(g_s), s	8.7	26.6	24.6	2.3	12.1	11.1	7.0	10.2	0.4	13.6	10.6	10.7
Cycle Q Clear(g_c), s	8.7	26.6	24.6	2.3	12.1	11.1	7.0	10.2	0.4	13.6	10.6	10.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.34
Lane Grp Cap(c), veh/h	450	1887	764	184	1494	761	385	883	274	645	844	437
V/C Ratio(X)	0.82	0.90	0.75	0.53	0.58	0.42	0.76	0.74	0.03	0.89	0.58	0.58
Avail Cap(c_a), veh/h	513	1909	771	205	1494	761	578	1182	367	656	865	448
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.5	25.0	17.6	38.7	25.2	14.2	36.2	32.9	28.8	33.2	27.6	27.7
Incr Delay (d2), s/veh	9.0	6.4	4.0	2.4	0.6	0.4	3.3	1.7	0.0	14.0	0.9	1.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.7	13.4	11.6	1.2	5.8	4.9	3.5	4.9	0.2	7.7	5.0	5.4
LnGrp Delay(d),s/veh	44.5	31.4	21.6	41.1	25.8	14.6	39.5	34.5	28.8	47.2	28.5	29.6
LnGrp LOS	D	C	C	D	C	B	D	C	C	D	C	C
Approach Vol, veh/h		2643			1283			953			1315	
Approach Delay, s/veh		31.1			24.1			36.0			36.9	
Approach LOS		C			C			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	20.2	19.1	9.0	35.6	13.9	25.4	15.5	29.2
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	16.0	19.5	5.0	31.5	14.1	21.4	12.5	24.0
Max Q Clear Time (g_c+I1), s	15.6	12.2	4.3	28.6	9.0	12.7	10.7	14.1
Green Ext Time (p_c), s	0.1	2.3	0.0	2.6	0.4	2.8	0.2	4.4

Intersection Summary			
HCM 2010 Ctrl Delay			31.6
HCM 2010 LOS			C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	24	1926	238	197	1179	34	111	12	197	18	9	1
Future Volume (veh/h)	24	1926	238	197	1179	34	111	12	197	18	9	1
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	26	2049	122	210	1254	22	118	13	28	19	10	0
Adj No. of Lanes	1	3	1	1	3	1	1	1	1	1	2	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	51	2668	831	258	3261	1015	273	217	184	264	412	0
Arrive On Green	0.03	0.52	0.52	0.15	0.64	0.64	0.12	0.12	0.12	0.12	0.12	0.00
Sat Flow, veh/h	1774	5085	1583	1774	5085	1583	1399	1863	1583	1360	3632	0
Grp Volume(v), veh/h	26	2049	122	210	1254	22	118	13	28	19	10	0
Grp Sat Flow(s),veh/h/ln	1774	1695	1583	1774	1695	1583	1399	1863	1583	1360	1770	0
Q Serve(g_s), s	0.9	20.3	2.5	7.3	7.4	0.3	5.2	0.4	1.0	0.8	0.2	0.0
Cycle Q Clear(g_c), s	0.9	20.3	2.5	7.3	7.4	0.3	5.3	0.4	1.0	1.2	0.2	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	51	2668	831	258	3261	1015	273	217	184	264	412	0
V/C Ratio(X)	0.51	0.77	0.15	0.81	0.38	0.02	0.43	0.06	0.15	0.07	0.02	0.00
Avail Cap(c_a), veh/h	151	2855	889	351	3426	1067	520	545	463	503	1035	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	30.3	12.0	7.7	26.2	5.4	4.1	27.1	24.9	25.1	25.4	24.8	0.0
Incr Delay (d2), s/veh	7.5	1.2	0.1	10.1	0.1	0.0	1.1	0.1	0.4	0.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	9.6	1.1	4.3	3.4	0.1	2.1	0.2	0.5	0.3	0.1	0.0
LnGrp Delay(d),s/veh	37.7	13.2	7.8	36.3	5.5	4.1	28.2	25.0	25.5	25.5	24.8	0.0
LnGrp LOS	D	B	A	D	A	A	C	C	C	C	C	
Approach Vol, veh/h		2197			1486			159			29	
Approach Delay, s/veh		13.2			9.8			27.5			25.3	
Approach LOS		B			A			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		11.9	13.7	37.7		11.9	6.3	45.0
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		18.5	12.5	35.5		18.5	5.4	42.6
Max Q Clear Time (g_c+I1), s		7.3	9.3	22.3		3.2	2.9	9.4
Green Ext Time (p_c), s		0.3	0.2	10.9		0.0	0.0	11.6

Intersection Summary			
HCM 2010 Ctrl Delay			12.6
HCM 2010 LOS			B

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1372	0	0	960	568	389
Future Volume (veh/h)	1372	0	0	960	568	389
Number	4	14	3	8	5	12
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	0	0	1863	1863	1900
Adj Flow Rate, veh/h	1460	0	0	1021	507	514
Adj No. of Lanes	3	0	0	3	1	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	0	0	2	2	0
Cap, veh/h	2014	0	0	2014	675	615
Arrive On Green	0.40	0.00	0.00	0.40	0.38	0.38
Sat Flow, veh/h	5421	0	0	5421	1774	1615
Grp Volume(v), veh/h	1460	0	0	1021	507	514
Grp Sat Flow(s),veh/h/ln	1695	0	0	1695	1774	1615
Q Serve(g_s), s	9.8	0.0	0.0	6.1	10.0	11.7
Cycle Q Clear(g_c), s	9.8	0.0	0.0	6.1	10.0	11.7
Prop In Lane		0.00	0.00		1.00	1.00
Lane Grp Cap(c), veh/h	2014	0	0	2014	675	615
V/C Ratio(X)	0.72	0.00	0.00	0.51	0.75	0.84
Avail Cap(c_a), veh/h	2272	0	0	2272	793	722
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	10.3	0.0	0.0	9.2	10.8	11.3
Incr Delay (d2), s/veh	1.0	0.0	0.0	0.2	3.4	7.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.7	0.0	0.0	2.9	5.4	6.4
LnGrp Delay(d),s/veh	11.3	0.0	0.0	9.4	14.2	18.8
LnGrp LOS	B			A	B	B
Approach Vol, veh/h	1460			1021	1021	
Approach Delay, s/veh	11.3			9.4	16.5	
Approach LOS	B			A	B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4				8
Phs Duration (G+Y+Rc), s		19.8		20.5				20.5
Change Period (Y+Rc), s		4.5		4.5				4.5
Max Green Setting (Gmax), s		18.0		18.0				18.0
Max Q Clear Time (g_c+I1), s		13.7		11.8				8.1
Green Ext Time (p_c), s		1.7		4.2				4.3

Intersection Summary		
HCM 2010 Ctrl Delay		12.3
HCM 2010 LOS		B

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	55	12	40	4	10	37	49	1447	20	49	1314	119
Future Volume (veh/h)	55	12	40	4	10	37	49	1447	20	49	1314	119
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	59	13	2	4	11	0	52	1539	20	52	1398	65
Adj No. of Lanes	1	1	1	1	1	1	2	3	0	1	3	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	121	128	108	34	35	30	181	2434	32	93	2392	745
Arrive On Green	0.07	0.07	0.07	0.02	0.02	0.00	0.05	0.47	0.47	0.05	0.47	0.47
Sat Flow, veh/h	1774	1863	1579	1774	1863	1583	3442	5174	67	1774	5085	1583
Grp Volume(v), veh/h	59	13	2	4	11	0	52	1008	551	52	1398	65
Grp Sat Flow(s),veh/h/ln	1774	1863	1579	1774	1863	1583	1721	1695	1851	1774	1695	1583
Q Serve(g_s), s	1.5	0.3	0.1	0.1	0.3	0.0	0.7	10.4	10.4	1.3	9.3	1.0
Cycle Q Clear(g_c), s	1.5	0.3	0.1	0.1	0.3	0.0	0.7	10.4	10.4	1.3	9.3	1.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.04	1.00		1.00
Lane Grp Cap(c), veh/h	121	128	108	34	35	30	181	1595	871	93	2392	745
V/C Ratio(X)	0.49	0.10	0.02	0.12	0.31	0.00	0.29	0.63	0.63	0.56	0.58	0.09
Avail Cap(c_a), veh/h	691	725	615	691	725	617	372	2267	1237	196	3411	1062
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	20.7	20.2	20.1	22.3	22.4	0.0	21.1	9.2	9.2	21.4	8.9	6.8
Incr Delay (d2), s/veh	3.0	0.3	0.1	1.6	4.9	0.0	0.9	0.4	0.8	5.1	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.2	0.0	0.1	0.2	0.0	0.3	4.9	5.4	0.8	4.3	0.5
LnGrp Delay(d),s/veh	23.7	20.5	20.1	23.8	27.3	0.0	21.9	9.6	10.0	26.5	9.2	6.8
LnGrp LOS	C	C	C	C	C		C	A	A	C	A	A
Approach Vol, veh/h		74			15			1611			1515	
Approach Delay, s/veh		23.1			26.4			10.2			9.7	
Approach LOS		C			C			B			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	6.9	26.2		7.7	6.9	26.2		5.4
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5
Max Green Setting (Gmax), s	5.1	30.9		18.0	5.0	31.0		18.0
Max Q Clear Time (g_c+I1), s	3.3	12.4		3.5	2.7	11.3		2.3
Green Ext Time (p_c), s	0.0	9.4		0.1	0.0	9.3		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	10.3
HCM 2010 LOS	B

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	128	998	0	1545	485	0
Future Volume (veh/h)	128	998	0	1545	485	0
Number	7	14	5	2	6	16
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	0	1863	1863	0
Adj Flow Rate, veh/h	136	775	0	1644	516	0
Adj No. of Lanes	1	2	0	3	3	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	0	2	2	0
Cap, veh/h	619	973	0	2319	2319	0
Arrive On Green	0.35	0.35	0.00	0.46	0.46	0.00
Sat Flow, veh/h	1774	2787	0	5421	5421	0
Grp Volume(v), veh/h	136	775	0	1644	516	0
Grp Sat Flow(s),veh/h/ln	1774	1393	0	1695	1695	0
Q Serve(g_s), s	2.5	11.6	0.0	12.0	2.8	0.0
Cycle Q Clear(g_c), s	2.5	11.6	0.0	12.0	2.8	0.0
Prop In Lane	1.00	1.00	0.00			0.00
Lane Grp Cap(c), veh/h	619	973	0	2319	2319	0
V/C Ratio(X)	0.22	0.80	0.00	0.71	0.22	0.00
Avail Cap(c_a), veh/h	826	1298	0	2699	2699	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	10.6	13.5	0.0	10.1	7.6	0.0
Incr Delay (d2), s/veh	0.2	2.6	0.0	0.7	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	4.8	0.0	5.6	1.3	0.0
LnGrp Delay(d),s/veh	10.8	16.1	0.0	10.8	7.7	0.0
LnGrp LOS	B	B		B	A	
Approach Vol, veh/h	911			1644	516	
Approach Delay, s/veh	15.3			10.8	7.7	
Approach LOS	B			B	A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		
Phs Duration (G+Y+Rc), s		25.6		20.6		25.6		
Change Period (Y+Rc), s		4.5		4.5		4.5		
Max Green Setting (Gmax), s		24.5		21.5		24.5		
Max Q Clear Time (g_c+I1), s		14.0		13.6		4.8		
Green Ext Time (p_c), s		7.1		2.5		2.9		

Intersection Summary		
HCM 2010 Ctrl Delay		11.6
HCM 2010 LOS		B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	40	75	54	139	57	13	92	581	128	57	265	51
Future Volume (veh/h)	40	75	54	139	57	13	92	581	128	57	265	51
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	43	80	11	148	61	3	98	618	50	61	282	17
Adj No. of Lanes	2	2	1	2	2	1	2	2	1	2	2	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	163	446	329	343	631	379	283	965	589	210	890	472
Arrive On Green	0.05	0.13	0.13	0.10	0.18	0.18	0.08	0.27	0.27	0.06	0.25	0.25
Sat Flow, veh/h	3442	3539	1580	3442	3539	1581	3442	3539	1582	3442	3539	1580
Grp Volume(v), veh/h	43	80	11	148	61	3	98	618	50	61	282	17
Grp Sat Flow(s),veh/h/ln	1721	1770	1580	1721	1770	1581	1721	1770	1582	1721	1770	1580
Q Serve(g_s), s	0.5	0.8	0.2	1.7	0.6	0.1	1.1	6.3	0.8	0.7	2.6	0.3
Cycle Q Clear(g_c), s	0.5	0.8	0.2	1.7	0.6	0.1	1.1	6.3	0.8	0.7	2.6	0.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	163	446	329	343	631	379	283	965	589	210	890	472
V/C Ratio(X)	0.26	0.18	0.03	0.43	0.10	0.01	0.35	0.64	0.08	0.29	0.32	0.04
Avail Cap(c_a), veh/h	421	1560	826	463	1603	813	421	1603	874	421	1603	791
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	18.8	16.0	12.9	17.3	14.0	11.8	17.7	13.1	8.3	18.3	12.4	10.2
Incr Delay (d2), s/veh	0.9	0.2	0.0	0.9	0.1	0.0	0.7	0.7	0.1	0.8	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.4	0.1	0.8	0.3	0.0	0.5	3.1	0.4	0.4	1.3	0.1
LnGrp Delay(d),s/veh	19.6	16.1	12.9	18.2	14.1	11.8	18.4	13.8	8.4	19.1	12.6	10.2
LnGrp LOS	B	B	B	B	B	B	B	B	A	B	B	B
Approach Vol, veh/h		134			212			766			360	
Approach Delay, s/veh		17.0			16.9			14.0			13.6	
Approach LOS		B			B			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.0	15.6	8.6	9.6	7.9	14.8	6.4	11.8
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	5.0	18.5	5.5	18.0	5.0	18.5	5.0	18.5
Max Q Clear Time (g_c+I1), s	2.7	8.3	3.7	2.8	3.1	4.6	2.5	2.6
Green Ext Time (p_c), s	0.0	2.8	0.1	0.3	0.0	1.3	0.0	0.2

Intersection Summary		
HCM 2010 Ctrl Delay		14.6
HCM 2010 LOS		B

Intersection	
Int Delay, s/veh	1.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	3	3	18	1	30	1	423	49	55	272	4
Future Vol, veh/h	1	3	3	18	1	30	1	423	49	55	272	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	Stop	-	-	Stop	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	3	3	19	1	32	1	450	52	59	289	4

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	888	913	291	889	889	476	293	0	0	502	0	0
Stage 1	409	409	-	478	478	-	-	-	-	-	-	-
Stage 2	479	504	-	411	411	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	264	273	748	264	282	589	1269	-	-	1062	-	-
Stage 1	619	596	-	568	556	-	-	-	-	-	-	-
Stage 2	568	541	-	618	595	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	236	255	748	247	263	589	1269	-	-	1062	-	-
Mov Cap-2 Maneuver	236	255	-	247	263	-	-	-	-	-	-	-
Stage 1	618	557	-	567	555	-	-	-	-	-	-	-
Stage 2	536	540	-	571	556	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	13.4	11.1	0	1.4
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1269	-	-	437	639	1062	-	-
HCM Lane V/C Ratio	0.001	-	-	0.017	0.082	0.055	-	-
HCM Control Delay (s)	7.8	0	-	13.4	11.1	8.6	0	-
HCM Lane LOS	A	A	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0.3	0.2	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	27	706	173	132	1357	429	185	160	77	415	372	38
Future Volume (veh/h)	27	706	173	132	1357	429	185	160	77	415	372	38
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.95	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	29	751	48	140	1444	169	197	170	8	441	396	29
Adj No. of Lanes	1	2	1	1	3	1	2	2	1	2	2	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	57	1074	469	179	1894	576	303	479	205	564	706	51
Arrive On Green	0.03	0.30	0.30	0.10	0.37	0.37	0.09	0.14	0.14	0.16	0.21	0.21
Sat Flow, veh/h	1774	3539	1545	1774	5085	1547	3442	3539	1510	3442	3340	243
Grp Volume(v), veh/h	29	751	48	140	1444	169	197	170	8	441	209	216
Grp Sat Flow(s),veh/h/ln	1774	1770	1545	1774	1695	1547	1721	1770	1510	1721	1770	1814
Q Serve(g_s), s	1.0	11.4	1.4	4.7	15.1	4.7	3.4	2.7	0.3	7.5	6.4	6.5
Cycle Q Clear(g_c), s	1.0	11.4	1.4	4.7	15.1	4.7	3.4	2.7	0.3	7.5	6.4	6.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.13
Lane Grp Cap(c), veh/h	57	1074	469	179	1894	576	303	479	205	564	374	383
V/C Ratio(X)	0.51	0.70	0.10	0.78	0.76	0.29	0.65	0.35	0.04	0.78	0.56	0.56
Avail Cap(c_a), veh/h	146	1229	537	275	2135	650	504	1107	472	708	658	675
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	28.9	18.7	15.2	26.7	16.7	13.4	26.8	23.8	22.8	24.4	21.4	21.5
Incr Delay (d2), s/veh	7.0	1.5	0.1	7.8	1.5	0.3	2.3	0.4	0.1	4.5	1.3	1.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	5.8	0.6	2.7	7.2	2.0	1.7	1.3	0.1	3.9	3.3	3.4
LnGrp Delay(d),s/veh	36.0	20.2	15.3	34.5	18.2	13.7	29.1	24.3	22.9	28.8	22.7	22.8
LnGrp LOS	D	C	B	C	B	B	C	C	C	C	C	C
Approach Vol, veh/h		828			1753			375			866	
Approach Delay, s/veh		20.5			19.1			26.8			25.8	
Approach LOS		C			B			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.5	12.7	10.6	22.9	9.9	17.3	6.4	27.1
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	12.5	19.0	9.4	21.1	8.9	22.6	5.0	25.5
Max Q Clear Time (g_c+I1), s	9.5	4.7	6.7	13.4	5.4	8.5	3.0	17.1
Green Ext Time (p_c), s	0.5	0.7	0.1	2.8	0.2	1.8	0.0	5.5

Intersection Summary	
HCM 2010 Ctrl Delay	21.7
HCM 2010 LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1085	145	270	1643	10	350	3	211	6	1	4
Future Volume (veh/h)	0	1085	145	270	1643	10	350	3	211	6	1	4
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	0	1154	145	287	1748	7	372	3	27	6	1	0
Adj No. of Lanes	2	2	0	2	2	1	2	1	0	1	2	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	5	1461	183	393	2277	1032	516	23	210	16	32	0
Arrive On Green	0.00	0.46	0.46	0.11	0.64	0.64	0.15	0.15	0.15	0.01	0.01	0.00
Sat Flow, veh/h	3442	3165	397	3442	3539	1582	3548	161	1447	1774	3539	1583
Grp Volume(v), veh/h	0	644	655	287	1748	7	372	0	30	6	1	0
Grp Sat Flow(s),veh/h/ln	1721	1770	1792	1721	1770	1582	1774	0	1607	1774	1770	1583
Q Serve(g_s), s	0.0	20.6	20.7	5.4	23.2	0.1	6.7	0.0	1.1	0.2	0.0	0.6
Cycle Q Clear(g_c), s	0.0	20.6	20.7	5.4	23.2	0.1	6.7	0.0	1.1	0.2	0.0	0.6
Prop In Lane	1.00		0.22	1.00		1.00	1.00		0.90	1.00		1.00
Lane Grp Cap(c), veh/h	5	817	827	393	2277	1032	516	0	234	16	32	-92
V/C Ratio(X)	0.00	0.79	0.79	0.73	0.77	0.01	0.72	0.00	0.13	0.37	0.03	0.00
Avail Cap(c_a), veh/h	258	1193	1208	541	2677	1211	983	0	445	478	954	320
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	15.2	15.2	28.6	8.4	4.0	27.2	0.0	24.8	32.9	32.8	0.0
Incr Delay (d2), s/veh	0.0	2.2	2.3	3.2	1.2	0.0	1.9	0.0	0.2	13.5	0.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	10.5	10.7	2.7	11.5	0.0	3.4	0.0	0.5	0.2	0.0	0.0
LnGrp Delay(d),s/veh	0.0	17.4	17.5	31.7	9.6	4.1	29.2	0.0	25.1	46.4	33.2	0.0
LnGrp LOS		B	B	C	A	A	C		C	D	C	
Approach Vol, veh/h		1299			2042			402			7	
Approach Delay, s/veh		17.5			12.7			28.9			44.5	
Approach LOS		B			B			C			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		14.2	12.1	35.3		5.1	0.0	47.5
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		18.5	10.5	45.0		18.0	5.0	50.5
Max Q Clear Time (g_c+I1), s		8.7	7.4	22.7		2.6	0.0	25.2
Green Ext Time (p_c), s		1.0	0.3	8.1		0.0	0.0	14.0

Intersection Summary		
HCM 2010 Ctrl Delay		16.1
HCM 2010 LOS		B

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	117	1105	37	114	1685	85	29	63	49	100	148	231
Future Volume (veh/h)	117	1105	37	114	1685	85	29	63	49	100	148	231
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	124	1176	22	121	1793	57	31	67	5	106	157	81
Adj No. of Lanes	1	2	1	1	2	1	1	1	1	1	1	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	157	2076	925	155	2073	923	175	279	236	250	279	236
Arrive On Green	0.09	0.59	0.59	0.09	0.59	0.59	0.15	0.15	0.15	0.15	0.15	0.15
Sat Flow, veh/h	1774	3539	1577	1774	3539	1577	1135	1863	1577	1318	1863	1577
Grp Volume(v), veh/h	124	1176	22	121	1793	57	31	67	5	106	157	81
Grp Sat Flow(s),veh/h/ln	1774	1770	1577	1774	1770	1577	1135	1863	1577	1318	1863	1577
Q Serve(g_s), s	5.2	15.7	0.4	5.1	32.5	1.2	2.0	2.4	0.2	5.9	6.0	3.5
Cycle Q Clear(g_c), s	5.2	15.7	0.4	5.1	32.5	1.2	8.0	2.4	0.2	8.3	6.0	3.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	157	2076	925	155	2073	923	175	279	236	250	279	236
V/C Ratio(X)	0.79	0.57	0.02	0.78	0.87	0.06	0.18	0.24	0.02	0.42	0.56	0.34
Avail Cap(c_a), veh/h	197	2096	934	295	2290	1020	280	450	381	371	450	381
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	34.2	9.8	6.6	34.2	13.3	6.8	33.9	28.7	27.7	32.4	30.2	29.2
Incr Delay (d2), s/veh	15.7	0.4	0.0	8.3	3.5	0.0	0.5	0.4	0.0	1.1	1.8	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.2	7.6	0.2	2.8	16.7	0.5	0.7	1.3	0.1	2.2	3.2	1.6
LnGrp Delay(d),s/veh	49.9	10.1	6.6	42.5	16.8	6.8	34.4	29.1	27.8	33.5	32.0	30.0
LnGrp LOS	D	B	A	D	B	A	C	C	C	C	C	C
Approach Vol, veh/h		1322			1971			103			344	
Approach Delay, s/veh		13.8			18.1			30.6			32.0	
Approach LOS		B			B			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		15.9	11.2	49.4		15.9	11.3	49.3
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		18.5	12.7	45.3		18.5	8.5	49.5
Max Q Clear Time (g_c+I1), s		10.0	7.1	17.7		10.3	7.2	34.5
Green Ext Time (p_c), s		0.2	0.1	8.5		0.8	0.0	10.3

Intersection Summary	
HCM 2010 Ctrl Delay	18.2
HCM 2010 LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	131	1148	40	258	1909	134	38	80	224	89	88	151
Future Volume (veh/h)	131	1148	40	258	1909	134	38	80	224	89	88	151
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	139	1221	39	274	2031	84	40	85	25	95	94	17
Adj No. of Lanes	1	3	0	1	2	1	1	2	0	1	2	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	167	2643	84	319	2152	962	221	362	103	221	400	71
Arrive On Green	0.09	0.52	0.52	0.18	0.61	0.61	0.13	0.13	0.13	0.13	0.13	0.13
Sat Flow, veh/h	1774	5063	162	1774	3539	1582	1275	2724	771	1276	3006	531
Grp Volume(v), veh/h	139	818	442	274	2031	84	40	54	56	95	54	57
Grp Sat Flow(s),veh/h/ln	1774	1695	1834	1774	1770	1582	1275	1770	1725	1276	1770	1768
Q Serve(g_s), s	6.3	12.4	12.4	12.3	43.2	1.8	2.4	2.2	2.4	5.9	2.3	2.3
Cycle Q Clear(g_c), s	6.3	12.4	12.4	12.3	43.2	1.8	4.7	2.2	2.4	8.3	2.3	2.3
Prop In Lane	1.00		0.09	1.00		1.00	1.00		0.45	1.00		0.30
Lane Grp Cap(c), veh/h	167	1770	958	319	2152	962	221	235	229	221	235	235
V/C Ratio(X)	0.83	0.46	0.46	0.86	0.94	0.09	0.18	0.23	0.24	0.43	0.23	0.24
Avail Cap(c_a), veh/h	167	1770	958	507	2182	975	336	395	385	336	395	395
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	36.5	12.3	12.3	32.6	14.8	6.6	33.9	31.8	31.8	35.5	31.8	31.8
Incr Delay (d2), s/veh	28.8	0.2	0.3	8.4	9.2	0.0	0.4	0.5	0.5	1.3	0.5	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.4	5.8	6.4	6.8	23.3	0.8	0.9	1.1	1.2	2.2	1.1	1.2
LnGrp Delay(d),s/veh	65.3	12.5	12.7	41.0	23.9	6.7	34.3	32.2	32.4	36.9	32.3	32.3
LnGrp LOS	E	B	B	D	C	A	C	C	C	D	C	C
Approach Vol, veh/h		1399			2389			150			206	
Approach Delay, s/veh		17.8			25.3			32.8			34.4	
Approach LOS		B			C			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		15.4	19.2	47.3		15.4	12.2	54.3
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		18.3	23.4	34.8		18.3	7.7	50.5
Max Q Clear Time (g_c+I1), s		6.7	14.3	14.4		10.3	8.3	45.2
Green Ext Time (p_c), s		0.4	0.5	7.4		0.4	0.0	4.6

Intersection Summary			
HCM 2010 Ctrl Delay			23.5
HCM 2010 LOS			C

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	162	1304	2056	160	151	245
Future Volume (veh/h)	162	1304	2056	160	151	245
Number	7	4	8	18	1	16
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1900	1863	1863
Adj Flow Rate, veh/h	172	1387	2187	156	161	258
Adj No. of Lanes	1	3	3	0	2	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	183	3149	3003	212	720	331
Arrive On Green	0.62	0.62	0.62	0.62	0.21	0.21
Sat Flow, veh/h	153	5253	5017	343	3442	1583
Grp Volume(v), veh/h	172	1387	1523	820	161	258
Grp Sat Flow(s),veh/h/ln	153	1695	1695	1802	1721	1583
Q Serve(g_s), s	15.8	7.5	16.3	16.7	2.0	8.1
Cycle Q Clear(g_c), s	32.5	7.5	16.3	16.7	2.0	8.1
Prop In Lane	1.00			0.19	1.00	1.00
Lane Grp Cap(c), veh/h	183	3149	2099	1116	720	331
V/C Ratio(X)	0.94	0.44	0.73	0.73	0.22	0.78
Avail Cap(c_a), veh/h	183	3149	2099	1116	1213	558
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	24.1	5.2	6.9	7.0	17.2	19.6
Incr Delay (d2), s/veh	48.9	0.1	1.3	2.5	0.2	4.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.9	3.5	7.8	8.8	1.0	3.9
LnGrp Delay(d),s/veh	73.0	5.3	8.2	9.5	17.4	23.6
LnGrp LOS	E	A	A	A	B	C
Approach Vol, veh/h		1559	2343		419	
Approach Delay, s/veh		12.8	8.7		21.2	
Approach LOS		B	A		C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs				4		6		8
Phs Duration (G+Y+Rc), s				37.0		15.5		37.0
Change Period (Y+Rc), s				4.5		4.5		4.5
Max Green Setting (Gmax), s				32.5		18.5		32.5
Max Q Clear Time (g_c+I1), s				34.5		10.1		18.7
Green Ext Time (p_c), s				0.0		0.9		11.0

Intersection Summary	
HCM 2010 Ctrl Delay	11.4
HCM 2010 LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	64	1379	7	102	2105	568	1	4	20	466	4	108
Future Volume (veh/h)	64	1379	7	102	2105	568	1	4	20	466	4	108
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1900	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	68	1467	6	109	2239	340	1	4	6	499	0	81
Adj No. of Lanes	1	3	0	1	3	1	0	1	0	2	0	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	200	2650	11	312	2623	814	3	13	19	629	0	279
Arrive On Green	0.05	0.51	0.51	0.06	0.52	0.52	0.02	0.02	0.02	0.18	0.00	0.18
Sat Flow, veh/h	1774	5227	21	1774	5085	1579	153	610	916	3548	0	1575
Grp Volume(v), veh/h	68	951	522	109	2239	340	11	0	0	499	0	81
Grp Sat Flow(s),veh/h/ln	1774	1695	1858	1774	1695	1579	1679	0	0	1774	0	1575
Q Serve(g_s), s	1.3	14.7	14.7	2.2	29.0	10.1	0.5	0.0	0.0	10.3	0.0	3.4
Cycle Q Clear(g_c), s	1.3	14.7	14.7	2.2	29.0	10.1	0.5	0.0	0.0	10.3	0.0	3.4
Prop In Lane	1.00		0.01	1.00		1.00	0.09		0.55	1.00		1.00
Lane Grp Cap(c), veh/h	200	1718	942	312	2623	814	35	0	0	629	0	279
V/C Ratio(X)	0.34	0.55	0.55	0.35	0.85	0.42	0.32	0.00	0.00	0.79	0.00	0.29
Avail Cap(c_a), veh/h	227	1730	948	363	2708	841	405	0	0	838	0	372
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	16.3	12.9	12.9	9.7	16.0	11.4	36.8	0.0	0.0	30.0	0.0	27.2
Incr Delay (d2), s/veh	1.0	0.4	0.7	0.7	2.8	0.3	5.1	0.0	0.0	3.9	0.0	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	6.8	7.6	1.1	14.2	4.4	0.3	0.0	0.0	5.3	0.0	1.5
LnGrp Delay(d),s/veh	17.3	13.3	13.6	10.4	18.8	11.7	41.9	0.0	0.0	33.9	0.0	27.8
LnGrp LOS	B	B	B	B	B	B	D			C		C
Approach Vol, veh/h		1541			2688			11			580	
Approach Delay, s/veh		13.6			17.5			41.9			33.0	
Approach LOS		B			B			D			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		6.1	9.0	43.1		18.0	8.3	43.8
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		18.4	6.7	38.9		18.0	5.0	40.6
Max Q Clear Time (g_c+I1), s		2.5	4.2	16.7		12.3	3.3	31.0
Green Ext Time (p_c), s		0.0	0.0	9.3		1.1	0.0	8.3

Intersection Summary	
HCM 2010 Ctrl Delay	18.2
HCM 2010 LOS	B

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	242	1017	635	265	1600	879	895	1171	117	774	1414	236
Future Volume (veh/h)	242	1017	635	265	1600	879	895	1171	117	774	1414	236
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.99	1.00		0.97	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	257	1082	614	282	1702	914	952	1246	27	823	1504	235
Adj No. of Lanes	2	3	1	2	3	1	2	3	1	2	3	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	218	1280	743	327	1441	849	769	1415	429	878	1370	214
Arrive On Green	0.06	0.25	0.25	0.09	0.28	0.28	0.22	0.28	0.28	0.26	0.31	0.31
Sat Flow, veh/h	3442	5085	1548	3442	5085	1570	3442	5085	1541	3442	4421	689
Grp Volume(v), veh/h	257	1082	614	282	1702	914	952	1246	27	823	1153	586
Grp Sat Flow(s),veh/h/ln	1721	1695	1548	1721	1695	1570	1721	1695	1541	1721	1695	1720
Q Serve(g_s), s	9.5	30.3	37.8	12.1	42.5	42.5	33.5	35.1	1.9	35.1	46.5	46.5
Cycle Q Clear(g_c), s	9.5	30.3	37.8	12.1	42.5	42.5	33.5	35.1	1.9	35.1	46.5	46.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.40
Lane Grp Cap(c), veh/h	218	1280	743	327	1441	849	769	1415	429	878	1051	533
V/C Ratio(X)	1.18	0.85	0.83	0.86	1.18	1.08	1.24	0.88	0.06	0.94	1.10	1.10
Avail Cap(c_a), veh/h	218	1280	743	351	1441	849	769	1415	429	929	1051	533
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	70.3	53.3	34.2	66.9	53.8	34.7	58.3	51.7	39.8	54.7	51.8	51.8
Incr Delay (d2), s/veh	117.8	5.4	7.6	18.5	89.0	53.8	118.4	6.8	0.1	16.1	58.1	69.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.1	14.9	23.5	6.6	31.8	47.6	28.5	17.4	0.8	18.6	30.2	32.3
LnGrp Delay(d),s/veh	188.0	58.7	41.8	85.4	142.8	88.5	176.6	58.5	39.8	70.8	109.8	120.9
LnGrp LOS	F	E	D	F	F	F	F	E	D	E	F	F
Approach Vol, veh/h		1953			2898			2225			2562	
Approach Delay, s/veh		70.4			120.1			108.8			99.8	
Approach LOS		E			F			F			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	42.8	46.2	18.7	42.3	38.0	51.0	14.0	47.0
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	40.5	39.5	15.3	36.7	33.5	46.5	9.5	42.5
Max Q Clear Time (g_c+I1), s	37.1	37.1	14.1	39.8	35.5	48.5	11.5	44.5
Green Ext Time (p_c), s	1.1	1.6	0.1	0.0	0.0	0.0	0.0	0.0

Intersection Summary		
HCM 2010 Ctrl Delay		102.0
HCM 2010 LOS		F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	77	1600	262	446	2381	168	273	106	465	132	68	41
Future Volume (veh/h)	77	1600	262	446	2381	168	273	106	465	132	68	41
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.97	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	82	1702	173	474	2533	134	290	113	142	140	72	9
Adj No. of Lanes	1	3	1	1	3	1	1	1	1	1	2	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	104	1723	534	483	2808	852	369	445	372	292	757	93
Arrive On Green	0.06	0.34	0.34	0.27	0.55	0.55	0.24	0.24	0.24	0.24	0.24	0.24
Sat Flow, veh/h	1774	5085	1576	1774	5085	1544	1309	1863	1559	1118	3168	388
Grp Volume(v), veh/h	82	1702	173	474	2533	134	290	113	142	140	40	41
Grp Sat Flow(s),veh/h/ln	1774	1695	1576	1774	1695	1544	1309	1863	1559	1118	1770	1787
Q Serve(g_s), s	4.1	29.9	7.3	23.9	40.0	3.8	19.9	4.4	6.9	10.4	1.6	1.6
Cycle Q Clear(g_c), s	4.1	29.9	7.3	23.9	40.0	3.8	21.5	4.4	6.9	14.9	1.6	1.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.22
Lane Grp Cap(c), veh/h	104	1723	534	483	2808	852	369	445	372	292	423	427
V/C Ratio(X)	0.78	0.99	0.32	0.98	0.90	0.16	0.79	0.25	0.38	0.48	0.09	0.10
Avail Cap(c_a), veh/h	104	1723	534	483	2808	852	369	445	372	292	423	427
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	41.8	29.6	22.1	32.5	18.0	9.9	35.1	27.8	28.7	33.8	26.7	26.7
Incr Delay (d2), s/veh	31.4	18.7	0.3	36.0	4.5	0.1	10.7	0.3	0.6	1.2	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.9	16.9	3.2	16.6	19.7	1.7	8.3	2.3	3.0	3.3	0.8	0.8
LnGrp Delay(d),s/veh	73.2	48.3	22.4	68.6	22.5	10.0	45.8	28.0	29.3	35.0	26.8	26.8
LnGrp LOS	E	D	C	E	C	A	D	C	C	C	C	C
Approach Vol, veh/h		1957			3141			545			221	
Approach Delay, s/veh		47.1			28.9			37.8			32.0	
Approach LOS		D			C			D			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		26.0	29.0	35.0		26.0	9.8	54.2
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		21.5	24.5	30.5		21.5	5.3	49.7
Max Q Clear Time (g_c+I1), s		23.5	25.9	31.9		16.9	6.1	42.0
Green Ext Time (p_c), s		0.0	0.0	0.0		0.4	0.0	7.3

Intersection Summary	
HCM 2010 Ctrl Delay	35.9
HCM 2010 LOS	D

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1422	0	0	1909	1360	231
Future Volume (veh/h)	1422	0	0	1909	1360	231
Number	4	14	3	8	5	12
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	0	0	1863	1863	1900
Adj Flow Rate, veh/h	1513	0	0	2031	1674	0
Adj No. of Lanes	3	0	0	3	2	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	0	0	2	2	0
Cap, veh/h	2042	0	0	2042	1724	785
Arrive On Green	0.40	0.00	0.00	0.40	0.49	0.00
Sat Flow, veh/h	5421	0	0	5421	3548	1615
Grp Volume(v), veh/h	1513	0	0	2031	1674	0
Grp Sat Flow(s),veh/h/ln	1695	0	0	1695	1774	1615
Q Serve(g_s), s	20.3	0.0	0.0	31.8	36.7	0.0
Cycle Q Clear(g_c), s	20.3	0.0	0.0	31.8	36.7	0.0
Prop In Lane		0.00	0.00		1.00	1.00
Lane Grp Cap(c), veh/h	2042	0	0	2042	1724	785
V/C Ratio(X)	0.74	0.00	0.00	0.99	0.97	0.00
Avail Cap(c_a), veh/h	2042	0	0	2042	1726	786
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	20.4	0.0	0.0	23.8	20.0	0.0
Incr Delay (d2), s/veh	1.5	0.0	0.0	18.7	15.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.7	0.0	0.0	18.4	21.3	0.0
LnGrp Delay(d),s/veh	21.9	0.0	0.0	42.5	35.3	0.0
LnGrp LOS	C			D	D	
Approach Vol, veh/h	1513			2031	1674	
Approach Delay, s/veh	21.9			42.5	35.3	
Approach LOS	C			D	D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4				8
Phs Duration (G+Y+Rc), s		43.4		36.6				36.6
Change Period (Y+Rc), s		4.5		4.5				4.5
Max Green Setting (Gmax), s		38.9		32.1				32.1
Max Q Clear Time (g_c+I1), s		38.7		22.3				33.8
Green Ext Time (p_c), s		0.1		6.2				0.0

Intersection Summary	
HCM 2010 Ctrl Delay	34.2
HCM 2010 LOS	C

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	335	57	372	35	74	205	309	1915	74	170	2068	674
Future Volume (veh/h)	335	57	372	35	74	205	309	1915	74	170	2068	674
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.93	1.00		0.97	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	356	61	136	37	79	47	329	2037	76	181	2200	413
Adj No. of Lanes	1	1	1	1	1	1	2	3	0	1	3	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	382	401	334	107	113	89	369	2348	87	206	2420	741
Arrive On Green	0.22	0.22	0.22	0.06	0.06	0.06	0.11	0.47	0.47	0.12	0.48	0.48
Sat Flow, veh/h	1774	1863	1552	1774	1863	1474	3442	5027	187	1774	5085	1557
Grp Volume(v), veh/h	356	61	136	37	79	47	329	1372	741	181	2200	413
Grp Sat Flow(s),veh/h/ln	1774	1863	1552	1774	1863	1474	1721	1695	1823	1774	1695	1557
Q Serve(g_s), s	25.2	3.4	9.6	2.6	5.3	4.0	12.0	46.3	46.6	12.8	51.0	24.2
Cycle Q Clear(g_c), s	25.2	3.4	9.6	2.6	5.3	4.0	12.0	46.3	46.6	12.8	51.0	24.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.10	1.00		1.00
Lane Grp Cap(c), veh/h	382	401	334	107	113	89	369	1584	852	206	2420	741
V/C Ratio(X)	0.93	0.15	0.41	0.34	0.70	0.53	0.89	0.87	0.87	0.88	0.91	0.56
Avail Cap(c_a), veh/h	396	416	346	250	263	208	369	1604	862	210	2461	753
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	49.2	40.6	43.1	57.5	58.8	58.2	56.3	30.5	30.5	55.6	30.9	23.9
Incr Delay (d2), s/veh	28.3	0.2	0.8	1.9	7.6	4.7	22.6	5.2	9.5	31.6	5.5	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	15.4	1.8	4.2	1.3	3.0	1.7	6.9	22.7	25.7	8.1	25.1	10.5
LnGrp Delay(d),s/veh	77.5	40.8	43.9	59.4	66.4	62.9	78.9	35.7	40.0	87.2	36.4	24.8
LnGrp LOS	E	D	D	E	E	E	E	D	D	F	D	C
Approach Vol, veh/h		553			163			2442			2794	
Approach Delay, s/veh		65.2			63.8			42.8			38.0	
Approach LOS		E			E			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	19.3	64.2		32.0	18.2	65.3		12.2
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5
Max Green Setting (Gmax), s	15.1	60.4		28.5	13.7	61.8		18.0
Max Q Clear Time (g_c+I1), s	14.8	48.6		27.2	14.0	53.0		7.3
Green Ext Time (p_c), s	0.0	9.1		0.3	0.0	7.7		0.4

Intersection Summary	
HCM 2010 Ctrl Delay	43.2
HCM 2010 LOS	D

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↰	↱↱		↑↑↑	↑↑↑	
Traffic Volume (veh/h)	230	1590	0	2445	1334	0
Future Volume (veh/h)	230	1590	0	2445	1334	0
Number	7	14	5	2	6	16
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	0	1863	1863	0
Adj Flow Rate, veh/h	245	1647	0	2601	1419	0
Adj No. of Lanes	1	2	0	3	3	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	0	2	2	0
Cap, veh/h	850	1335	0	2267	2267	0
Arrive On Green	0.48	0.48	0.00	0.45	0.45	0.00
Sat Flow, veh/h	1774	2787	0	5421	5421	0
Grp Volume(v), veh/h	245	1647	0	2601	1419	0
Grp Sat Flow(s),veh/h/ln	1774	1393	0	1695	1695	0
Q Serve(g_s), s	10.0	57.5	0.0	53.5	25.7	0.0
Cycle Q Clear(g_c), s	10.0	57.5	0.0	53.5	25.7	0.0
Prop In Lane	1.00	1.00	0.00			0.00
Lane Grp Cap(c), veh/h	850	1335	0	2267	2267	0
V/C Ratio(X)	0.29	1.23	0.00	1.15	0.63	0.00
Avail Cap(c_a), veh/h	850	1335	0	2267	2267	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	18.9	31.3	0.0	33.3	25.6	0.0
Incr Delay (d2), s/veh	0.2	111.7	0.0	72.0	0.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.9	42.8	0.0	40.1	12.1	0.0
LnGrp Delay(d),s/veh	19.1	143.0	0.0	105.2	26.1	0.0
LnGrp LOS	B	F		F	C	
Approach Vol, veh/h	1892			2601	1419	
Approach Delay, s/veh	127.0			105.2	26.1	
Approach LOS	F			F	C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		
Phs Duration (G+Y+Rc), s		58.0		62.0		58.0		
Change Period (Y+Rc), s		4.5		4.5		4.5		
Max Green Setting (Gmax), s		53.5		57.5		53.5		
Max Q Clear Time (g_c+I1), s		55.5		59.5		27.7		
Green Ext Time (p_c), s		0.0		0.0		10.5		

Intersection Summary		
HCM 2010 Ctrl Delay		93.2
HCM 2010 LOS		F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	173	156	85	367	177	74	194	912	309	131	641	174
Future Volume (veh/h)	173	156	85	367	177	74	194	912	309	131	641	174
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.98	1.00		0.99	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	184	166	20	390	188	14	206	970	164	139	682	75
Adj No. of Lanes	2	2	1	2	2	1	2	2	1	2	2	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	294	353	302	517	583	381	315	1239	784	272	1195	657
Arrive On Green	0.09	0.10	0.10	0.15	0.16	0.16	0.09	0.35	0.35	0.08	0.34	0.34
Sat Flow, veh/h	3442	3539	1574	3442	3539	1554	3442	3539	1561	3442	3539	1545
Grp Volume(v), veh/h	184	166	20	390	188	14	206	970	164	139	682	75
Grp Sat Flow(s),veh/h/ln	1721	1770	1574	1721	1770	1554	1721	1770	1561	1721	1770	1545
Q Serve(g_s), s	2.9	2.5	0.6	6.1	2.6	0.4	3.2	13.8	3.3	2.2	8.9	1.7
Cycle Q Clear(g_c), s	2.9	2.5	0.6	6.1	2.6	0.4	3.2	13.8	3.3	2.2	8.9	1.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	294	353	302	517	583	381	315	1239	784	272	1195	657
V/C Ratio(X)	0.63	0.47	0.07	0.75	0.32	0.04	0.65	0.78	0.21	0.51	0.57	0.11
Avail Cap(c_a), veh/h	521	1136	650	644	1262	679	417	1482	892	307	1369	733
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	24.8	23.8	18.6	22.8	20.7	16.2	24.6	16.3	7.8	24.8	15.2	9.8
Incr Delay (d2), s/veh	2.2	1.0	0.1	3.9	0.3	0.0	2.3	2.3	0.1	1.5	0.4	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	1.3	0.3	3.2	1.3	0.2	1.6	7.0	1.4	1.1	4.3	0.7
LnGrp Delay(d),s/veh	27.0	24.8	18.7	26.8	21.0	16.2	26.9	18.7	8.0	26.3	15.7	9.9
LnGrp LOS	C	C	B	C	C	B	C	B	A	C	B	A
Approach Vol, veh/h		370			592			1340			896	
Approach Delay, s/veh		25.6			24.7			18.6			16.8	
Approach LOS		C			C			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.9	24.1	12.9	10.1	9.6	23.4	9.3	13.7
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	5.0	23.5	10.5	18.0	6.8	21.7	8.5	20.0
Max Q Clear Time (g_c+I1), s	4.2	15.8	8.1	4.5	5.2	10.9	4.9	4.6
Green Ext Time (p_c), s	0.0	3.9	0.4	0.7	0.1	3.2	0.2	0.9

Intersection Summary	
HCM 2010 Ctrl Delay	20.0
HCM 2010 LOS	C

Intersection	
Int Delay, s/veh	6.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	4	0	102	7	239	3	219	41	137	392	3
Future Vol, veh/h	1	4	0	102	7	239	3	219	41	137	392	3
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	Stop	-	-	Stop	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	4	0	109	7	254	3	233	44	146	417	3

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	976	994	419	974	973	255	420	0	0	277	0	0
Stage 1	711	711	-	261	261	-	-	-	-	-	-	-
Stage 2	265	283	-	713	712	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	230	245	634	231	252	784	1139	-	-	1286	-	-
Stage 1	424	436	-	744	692	-	-	-	-	-	-	-
Stage 2	740	677	-	423	436	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	134	208	634	201	214	784	1139	-	-	1286	-	-
Mov Cap-2 Maneuver	134	208	-	201	214	-	-	-	-	-	-	-
Stage 1	423	371	-	742	690	-	-	-	-	-	-	-
Stage 2	493	675	-	356	371	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	24.8	17.9	0.1	2.1
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1139	-	-	187	644	1286	-	-
HCM Lane V/C Ratio	0.003	-	-	0.028	0.575	0.113	-	-
HCM Control Delay (s)	8.2	0	-	24.8	17.9	8.2	0	-
HCM Lane LOS	A	A	-	C	C	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	3.7	0.4	-	-

APPENDIX G

BUILDOUT (2040) WITH PROJECT CONDITIONS PEAK HOUR INTERSECTION ANALYSIS WORKSHEETS

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	23	1235	375	81	769	301	273	273	131	361	335	12
Future Volume (veh/h)	23	1235	375	81	769	301	273	273	131	361	335	12
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		0.99	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	24	1314	162	86	818	143	290	290	22	384	356	10
Adj No. of Lanes	1	2	1	1	3	1	2	2	1	2	2	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	47	1525	682	110	2373	730	381	461	204	473	552	15
Arrive On Green	0.03	0.43	0.43	0.06	0.47	0.47	0.11	0.13	0.13	0.14	0.16	0.16
Sat Flow, veh/h	1774	3539	1583	1774	5085	1564	3442	3539	1569	3442	3514	98
Grp Volume(v), veh/h	24	1314	162	86	818	143	290	290	22	384	179	187
Grp Sat Flow(s),veh/h/ln	1774	1770	1583	1774	1695	1564	1721	1770	1569	1721	1770	1843
Q Serve(g_s), s	1.0	25.3	4.9	3.6	7.7	4.0	6.2	5.8	0.9	8.1	7.1	7.2
Cycle Q Clear(g_c), s	1.0	25.3	4.9	3.6	7.7	4.0	6.2	5.8	0.9	8.1	7.1	7.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.05
Lane Grp Cap(c), veh/h	47	1525	682	110	2373	730	381	461	204	473	278	289
V/C Ratio(X)	0.52	0.86	0.24	0.78	0.34	0.20	0.76	0.63	0.11	0.81	0.64	0.65
Avail Cap(c_a), veh/h	130	1670	747	130	2399	738	467	917	407	526	489	509
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	36.2	19.4	13.6	34.8	12.8	11.8	32.5	31.0	28.9	31.5	29.7	29.8
Incr Delay (d2), s/veh	8.6	4.6	0.2	22.5	0.1	0.1	5.8	1.4	0.2	8.5	2.5	2.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	13.2	2.1	2.5	3.6	1.7	3.2	3.0	0.4	4.4	3.7	3.8
LnGrp Delay(d),s/veh	44.7	23.9	13.8	57.2	12.8	11.9	38.3	32.4	29.1	40.0	32.2	32.2
LnGrp LOS	D	C	B	E	B	B	D	C	C	D	C	C
Approach Vol, veh/h		1500			1047			602			750	
Approach Delay, s/veh		23.2			16.4			35.1			36.2	
Approach LOS		C			B			D			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	14.9	14.3	9.2	36.9	12.8	16.3	6.5	39.6				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	11.5	19.5	5.5	35.5	10.2	20.8	5.5	35.5				
Max Q Clear Time (g_c+I1), s	10.1	7.8	5.6	27.3	8.2	9.2	3.0	9.7				
Green Ext Time (p_c), s	0.2	1.2	0.0	5.1	0.2	1.4	0.0	5.7				
Intersection Summary												
HCM 2010 Ctrl Delay			25.7									
HCM 2010 LOS			C									

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	6	1548	228	394	692	34	473	4	452	4	34	7
Future Volume (veh/h)	6	1548	228	394	692	34	473	4	452	4	34	7
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	6	1647	236	419	736	22	503	4	212	4	36	0
Adj No. of Lanes	2	2	0	2	2	1	2	1	0	1	2	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	26	1653	232	425	2287	1071	613	5	269	53	106	59
Arrive On Green	0.01	0.53	0.53	0.12	0.65	0.65	0.17	0.17	0.17	0.03	0.03	0.00
Sat Flow, veh/h	3442	3118	438	3442	3539	1583	3548	29	1558	1774	3539	1583
Grp Volume(v), veh/h	6	920	963	419	736	22	503	0	216	4	36	0
Grp Sat Flow(s),veh/h/ln	1721	1770	1786	1721	1770	1583	1774	0	1588	1774	1770	1583
Q Serve(g_s), s	0.2	63.8	66.5	15.2	11.6	0.6	17.1	0.0	16.3	0.3	1.3	0.0
Cycle Q Clear(g_c), s	0.2	63.8	66.5	15.2	11.6	0.6	17.1	0.0	16.3	0.3	1.3	0.0
Prop In Lane	1.00		0.25	1.00		1.00	1.00		0.98	1.00		1.00
Lane Grp Cap(c), veh/h	26	938	947	425	2287	1071	613	0	274	53	106	59
V/C Ratio(X)	0.23	0.98	1.02	0.99	0.32	0.02	0.82	0.00	0.79	0.08	0.34	0.00
Avail Cap(c_a), veh/h	137	938	947	425	2287	1071	905	0	405	255	508	239
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	61.9	28.8	29.5	54.8	9.9	6.7	50.0	0.0	49.7	59.1	59.6	0.0
Incr Delay (d2), s/veh	4.5	24.6	33.6	39.6	0.1	0.0	3.9	0.0	6.1	0.6	1.9	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	37.3	41.5	9.6	5.6	0.3	8.7	0.0	7.6	0.1	0.6	0.0
LnGrp Delay(d),s/veh	66.4	53.4	63.1	94.4	10.0	6.7	53.9	0.0	55.8	59.7	61.5	0.0
LnGrp LOS	E	D	F	F	A	A	D		E	E	E	
Approach Vol, veh/h		1889			1177			719			40	
Approach Delay, s/veh		58.4			40.0			54.5			61.3	
Approach LOS		E			D			D			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		26.2	20.0	71.0		8.3	5.4	85.6
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		32.0	15.5	66.5		18.0	5.0	77.0
Max Q Clear Time (g_c+I1), s		19.1	17.2	68.5		3.3	2.2	13.6
Green Ext Time (p_c), s		2.5	0.0	0.0		0.1	0.0	5.0

Intersection Summary	
HCM 2010 Ctrl Delay	52.0
HCM 2010 LOS	D

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	263	1753	41	147	851	59	57	185	143	143	91	164
Future Volume (veh/h)	263	1753	41	147	851	59	57	185	143	143	91	164
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	280	1865	23	156	905	26	61	197	22	152	97	25
Adj No. of Lanes	1	2	1	1	2	1	1	1	1	1	1	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	321	1907	852	175	1617	722	294	395	336	218	395	336
Arrive On Green	0.18	0.54	0.54	0.10	0.46	0.46	0.21	0.21	0.21	0.21	0.21	0.21
Sat Flow, veh/h	1774	3539	1582	1774	3539	1582	1264	1863	1583	1157	1863	1583
Grp Volume(v), veh/h	280	1865	23	156	905	26	61	197	22	152	97	25
Grp Sat Flow(s),veh/h/ln	1774	1770	1582	1774	1770	1582	1264	1863	1583	1157	1863	1583
Q Serve(g_s), s	13.8	46.2	0.6	7.8	16.8	0.8	3.8	8.4	1.0	10.7	3.9	1.1
Cycle Q Clear(g_c), s	13.8	46.2	0.6	7.8	16.8	0.8	7.7	8.4	1.0	19.1	3.9	1.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	321	1907	852	175	1617	722	294	395	336	218	395	336
V/C Ratio(X)	0.87	0.98	0.03	0.89	0.56	0.04	0.21	0.50	0.07	0.70	0.25	0.07
Avail Cap(c_a), veh/h	467	1908	853	175	1617	722	294	395	336	218	395	336
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.8	20.2	9.7	40.0	17.8	13.5	32.6	31.2	28.3	40.1	29.4	28.4
Incr Delay (d2), s/veh	11.8	15.7	0.0	38.4	0.4	0.0	0.3	1.0	0.1	9.4	0.3	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.8	26.4	0.3	5.7	8.3	0.4	1.3	4.4	0.4	4.3	2.0	0.5
LnGrp Delay(d),s/veh	47.7	35.9	9.7	78.4	18.3	13.5	33.0	32.2	28.4	49.5	29.8	28.5
LnGrp LOS	D	D	A	E	B	B	C	C	C	D	C	C
Approach Vol, veh/h		2168			1087			280			274	
Approach Delay, s/veh		37.2			26.8			32.1			40.6	
Approach LOS		D			C			C			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		23.6	13.4	53.0		23.6	20.8	45.6
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		19.1	8.9	48.5		19.1	23.7	33.7
Max Q Clear Time (g_c+I1), s		10.4	9.8	48.2		21.1	15.8	18.8
Green Ext Time (p_c), s		0.8	0.0	0.2		0.0	0.5	4.9

Intersection Summary	
HCM 2010 Ctrl Delay	34.1
HCM 2010 LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	55	2052	74	241	898	30	40	120	579	40	58	23
Future Volume (veh/h)	55	2052	74	241	898	30	40	120	579	40	58	23
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	59	2183	75	256	955	17	43	128	434	43	62	4
Adj No. of Lanes	1	3	0	1	2	1	1	2	0	1	2	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	76	2287	78	289	2029	908	371	414	365	80	789	50
Arrive On Green	0.04	0.45	0.45	0.16	0.57	0.57	0.23	0.23	0.23	0.23	0.23	0.23
Sat Flow, veh/h	1774	5050	173	1774	3539	1583	1329	1770	1561	845	3378	216
Grp Volume(v), veh/h	59	1463	795	256	955	17	43	128	434	43	32	34
Grp Sat Flow(s),veh/h/ln	1774	1695	1832	1774	1770	1583	1329	1770	1561	845	1770	1824
Q Serve(g_s), s	3.0	37.3	37.7	12.7	14.2	0.4	2.3	5.4	21.0	0.0	1.3	1.3
Cycle Q Clear(g_c), s	3.0	37.3	37.7	12.7	14.2	0.4	3.6	5.4	21.0	21.0	1.3	1.3
Prop In Lane	1.00		0.09	1.00		1.00	1.00		1.00	1.00		0.12
Lane Grp Cap(c), veh/h	76	1536	830	289	2029	908	371	414	365	80	414	426
V/C Ratio(X)	0.78	0.95	0.96	0.88	0.47	0.02	0.12	0.31	1.19	0.54	0.08	0.08
Avail Cap(c_a), veh/h	146	1539	832	290	2029	908	371	414	365	80	414	426
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	42.6	23.7	23.7	36.8	11.2	8.3	28.3	28.4	34.4	44.9	26.9	26.9
Incr Delay (d2), s/veh	15.3	13.4	21.4	25.9	0.2	0.0	0.1	0.4	109.6	6.9	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.8	20.1	23.9	8.3	6.9	0.2	0.9	2.7	20.0	1.2	0.6	0.7
LnGrp Delay(d),s/veh	57.9	37.1	45.2	62.7	11.4	8.3	28.4	28.9	144.0	51.8	27.0	27.0
LnGrp LOS	E	D	D	E	B	A	C	C	F	D	C	C
Approach Vol, veh/h		2317			1228			605			109	
Approach Delay, s/veh		40.4			22.0			111.4			36.8	
Approach LOS		D			C			F			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		25.5	19.2	45.2		25.5	8.4	56.0
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		21.0	14.7	40.8		21.0	7.4	48.1
Max Q Clear Time (g_c+I1), s		23.0	14.7	39.7		23.0	5.0	16.2
Green Ext Time (p_c), s		0.0	0.0	1.1		0.0	0.0	6.6

Intersection Summary	
HCM 2010 Ctrl Delay	45.1
HCM 2010 LOS	D

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	106	2572	1140	37	27	35
Future Volume (veh/h)	106	2572	1140	37	27	35
Number	7	4	8	18	1	16
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1900	1863	1863
Adj Flow Rate, veh/h	113	2736	1213	37	29	16
Adj No. of Lanes	1	3	3	0	2	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	458	3849	3838	117	164	75
Arrive On Green	0.76	0.76	0.76	0.76	0.05	0.05
Sat Flow, veh/h	443	5253	5239	155	3442	1583
Grp Volume(v), veh/h	113	2736	811	439	29	16
Grp Sat Flow(s),veh/h/ln	443	1695	1695	1835	1721	1583
Q Serve(g_s), s	5.0	13.0	3.5	3.5	0.4	0.4
Cycle Q Clear(g_c), s	8.6	13.0	3.5	3.5	0.4	0.4
Prop In Lane	1.00			0.08	1.00	1.00
Lane Grp Cap(c), veh/h	458	3849	2566	1389	164	75
V/C Ratio(X)	0.25	0.71	0.32	0.32	0.18	0.21
Avail Cap(c_a), veh/h	483	4143	2762	1495	1383	636
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	3.2	2.9	1.8	1.8	21.1	21.1
Incr Delay (d2), s/veh	0.3	0.5	0.1	0.1	0.5	1.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	6.0	1.6	1.8	0.2	0.2
LnGrp Delay(d),s/veh	3.4	3.5	1.9	1.9	21.6	22.5
LnGrp LOS	A	A	A	A	C	C
Approach Vol, veh/h		2849	1250		45	
Approach Delay, s/veh		3.5	1.9		21.9	
Approach LOS		A	A		C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs				4		6		8
Phs Duration (G+Y+Rc), s				39.3		6.7		39.3
Change Period (Y+Rc), s				4.5		4.5		4.5
Max Green Setting (Gmax), s				37.5		18.5		37.5
Max Q Clear Time (g_c+I1), s				15.0		2.4		5.5
Green Ext Time (p_c), s				19.8		0.1		8.5

Intersection Summary	
HCM 2010 Ctrl Delay	3.2
HCM 2010 LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	41	2548	4	23	1123	63	18	1	18	34	0	30
Future Volume (veh/h)	41	2548	4	23	1123	63	18	1	18	34	0	30
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1900	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	44	2711	4	24	1195	48	19	1	5	36	0	19
Adj No. of Lanes	1	3	0	1	3	1	0	1	0	2	0	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	407	3529	5	170	3355	1044	38	2	10	164	0	73
Arrive On Green	0.04	0.67	0.67	0.03	0.66	0.66	0.03	0.03	0.03	0.05	0.00	0.05
Sat Flow, veh/h	1774	5244	8	1774	5085	1582	1318	69	347	3548	0	1576
Grp Volume(v), veh/h	44	1752	963	24	1195	48	25	0	0	36	0	19
Grp Sat Flow(s),veh/h/ln	1774	1695	1861	1774	1695	1582	1734	0	0	1774	0	1576
Q Serve(g_s), s	0.6	27.9	27.9	0.3	8.3	0.8	1.1	0.0	0.0	0.8	0.0	0.9
Cycle Q Clear(g_c), s	0.6	27.9	27.9	0.3	8.3	0.8	1.1	0.0	0.0	0.8	0.0	0.9
Prop In Lane	1.00		0.00	1.00		1.00	0.76		0.20	1.00		1.00
Lane Grp Cap(c), veh/h	407	2281	1253	170	3355	1044	50	0	0	164	0	73
V/C Ratio(X)	0.11	0.77	0.77	0.14	0.36	0.05	0.50	0.00	0.00	0.22	0.00	0.26
Avail Cap(c_a), veh/h	451	2576	1414	236	3857	1200	403	0	0	802	0	356
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	4.2	8.8	8.8	9.8	6.0	4.8	38.1	0.0	0.0	36.6	0.0	36.7
Incr Delay (d2), s/veh	0.1	1.3	2.3	0.4	0.1	0.0	7.5	0.0	0.0	0.7	0.0	1.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	13.1	14.7	0.2	3.9	0.4	0.6	0.0	0.0	0.4	0.0	0.4
LnGrp Delay(d),s/veh	4.3	10.1	11.2	10.2	6.1	4.8	45.6	0.0	0.0	37.3	0.0	38.5
LnGrp LOS	A	B	B	B	A	A	D			D		D
Approach Vol, veh/h		2759			1267			25			55	
Approach Delay, s/veh		10.4			6.1			45.6			37.7	
Approach LOS		B			A			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		6.8	6.6	58.1		8.2	7.6	57.0
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		18.5	5.0	60.5		18.0	5.1	60.4
Max Q Clear Time (g_c+I1), s		3.1	2.3	29.9		2.9	2.6	10.3
Green Ext Time (p_c), s		0.0	0.0	23.7		0.1	0.0	9.6

Intersection Summary	
HCM 2010 Ctrl Delay	9.6
HCM 2010 LOS	A

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	378	1658	581	92	826	371	279	612	55	539	615	117
Future Volume (veh/h)	378	1658	581	92	826	371	279	612	55	539	615	117
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	402	1764	581	98	879	321	297	651	8	573	654	91
Adj No. of Lanes	2	3	1	2	3	1	2	3	1	2	3	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	485	1914	773	183	1468	752	387	872	271	643	1111	153
Arrive On Green	0.14	0.38	0.38	0.05	0.29	0.29	0.11	0.17	0.17	0.19	0.25	0.25
Sat Flow, veh/h	3442	5085	1582	3442	5085	1582	3442	5085	1581	3442	4520	622
Grp Volume(v), veh/h	402	1764	581	98	879	321	297	651	8	573	489	256
Grp Sat Flow(s),veh/h/ln	1721	1695	1582	1721	1695	1582	1721	1695	1581	1721	1695	1752
Q Serve(g_s), s	9.6	28.1	25.1	2.4	12.6	11.3	7.1	10.3	0.4	13.8	10.8	11.0
Cycle Q Clear(g_c), s	9.6	28.1	25.1	2.4	12.6	11.3	7.1	10.3	0.4	13.8	10.8	11.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.36
Lane Grp Cap(c), veh/h	485	1914	773	183	1468	752	387	872	271	643	833	431
V/C Ratio(X)	0.83	0.92	0.75	0.54	0.60	0.43	0.77	0.75	0.03	0.89	0.59	0.60
Avail Cap(c_a), veh/h	552	1926	777	203	1468	752	573	1134	352	650	833	431
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.4	25.2	17.5	39.1	25.9	14.6	36.5	33.4	29.2	33.6	28.2	28.2
Incr Delay (d2), s/veh	9.3	7.9	4.1	2.4	0.7	0.4	3.6	2.0	0.0	14.5	1.1	2.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.2	14.5	11.7	1.2	6.0	5.0	3.6	5.0	0.2	7.8	5.1	5.5
LnGrp Delay(d),s/veh	44.7	33.1	21.6	41.5	26.6	15.0	40.2	35.4	29.3	48.1	29.2	30.5
LnGrp LOS	D	C	C	D	C	B	D	D	C	D	C	C
Approach Vol, veh/h		2747			1298			956			1318	
Approach Delay, s/veh		32.4			24.9			36.8			37.7	
Approach LOS		C			C			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	20.3	19.0	9.0	36.4	14.0	25.3	16.4	29.0
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	16.0	18.9	5.0	32.1	14.1	20.8	13.6	23.5
Max Q Clear Time (g_c+I1), s	15.8	12.3	4.4	30.1	9.1	13.0	11.6	14.6
Green Ext Time (p_c), s	0.1	2.1	0.0	1.8	0.4	2.6	0.3	4.2

Intersection Summary	
HCM 2010 Ctrl Delay	32.6
HCM 2010 LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	24	1983	238	197	1194	34	111	12	197	18	9	1
Future Volume (veh/h)	24	1983	238	197	1194	34	111	12	197	18	9	1
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	26	2110	122	210	1270	22	118	13	47	19	10	0
Adj No. of Lanes	1	3	1	1	3	1	1	1	1	1	2	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	51	2677	833	256	3265	1016	274	220	187	262	418	0
Arrive On Green	0.03	0.53	0.53	0.14	0.64	0.64	0.12	0.12	0.12	0.12	0.12	0.00
Sat Flow, veh/h	1774	5085	1583	1774	5085	1583	1399	1863	1583	1337	3632	0
Grp Volume(v), veh/h	26	2110	122	210	1270	22	118	13	47	19	10	0
Grp Sat Flow(s),veh/h/ln	1774	1695	1583	1774	1695	1583	1399	1863	1583	1337	1770	0
Q Serve(g_s), s	0.9	21.5	2.5	7.4	7.6	0.3	5.2	0.4	1.7	0.8	0.2	0.0
Cycle Q Clear(g_c), s	0.9	21.5	2.5	7.4	7.6	0.3	5.4	0.4	1.7	1.2	0.2	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	51	2677	833	256	3265	1016	274	220	187	262	418	0
V/C Ratio(X)	0.51	0.79	0.15	0.82	0.39	0.02	0.43	0.06	0.25	0.07	0.02	0.00
Avail Cap(c_a), veh/h	150	2821	878	319	3306	1029	535	568	482	512	1078	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	30.6	12.3	7.8	26.6	5.5	4.2	27.3	25.1	25.6	25.6	25.0	0.0
Incr Delay (d2), s/veh	7.5	1.5	0.1	12.8	0.1	0.0	1.1	0.1	0.7	0.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	10.3	1.1	4.5	3.6	0.1	2.1	0.2	0.8	0.3	0.1	0.0
LnGrp Delay(d),s/veh	38.2	13.8	7.9	39.3	5.5	4.2	28.4	25.2	26.3	25.7	25.0	0.0
LnGrp LOS	D	B	A	D	A	A	C	C	C	C	C	
Approach Vol, veh/h		2258			1502			178			29	
Approach Delay, s/veh		13.7			10.2			27.6			25.5	
Approach LOS		B			B			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		12.1	13.7	38.2		12.1	6.4	45.6
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		19.5	11.5	35.5		19.5	5.4	41.6
Max Q Clear Time (g_c+I1), s		7.4	9.4	23.5		3.2	2.9	9.6
Green Ext Time (p_c), s		0.4	0.1	10.2		0.0	0.0	11.7

Intersection Summary			
HCM 2010 Ctrl Delay			13.1
HCM 2010 LOS			B

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1380	0	0	963	581	389
Future Volume (veh/h)	1380	0	0	963	581	389
Number	4	14	3	8	5	12
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	0	0	1863	1863	1900
Adj Flow Rate, veh/h	1468	0	0	1024	505	513
Adj No. of Lanes	3	0	0	3	1	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	0	0	2	2	0
Cap, veh/h	2018	0	0	2018	674	613
Arrive On Green	0.40	0.00	0.00	0.40	0.38	0.38
Sat Flow, veh/h	5421	0	0	5421	1774	1615
Grp Volume(v), veh/h	1468	0	0	1024	505	513
Grp Sat Flow(s),veh/h/ln	1695	0	0	1695	1774	1615
Q Serve(g_s), s	9.9	0.0	0.0	6.1	9.9	11.6
Cycle Q Clear(g_c), s	9.9	0.0	0.0	6.1	9.9	11.6
Prop In Lane		0.00	0.00		1.00	1.00
Lane Grp Cap(c), veh/h	2018	0	0	2018	674	613
V/C Ratio(X)	0.73	0.00	0.00	0.51	0.75	0.84
Avail Cap(c_a), veh/h	2270	0	0	2270	792	721
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	10.3	0.0	0.0	9.2	10.8	11.4
Incr Delay (d2), s/veh	1.1	0.0	0.0	0.2	3.3	7.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.7	0.0	0.0	2.9	5.4	6.4
LnGrp Delay(d),s/veh	11.4	0.0	0.0	9.4	14.2	18.8
LnGrp LOS	B			A	B	B
Approach Vol, veh/h	1468			1024	1018	
Approach Delay, s/veh	11.4			9.4	16.5	
Approach LOS	B			A	B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4				8
Phs Duration (G+Y+Rc), s		19.8		20.5				20.5
Change Period (Y+Rc), s		4.5		4.5				4.5
Max Green Setting (Gmax), s		18.0		18.0				18.0
Max Q Clear Time (g_c+I1), s		13.6		11.9				8.1
Green Ext Time (p_c), s		1.7		4.1				4.3

Intersection Summary		
HCM 2010 Ctrl Delay		12.3
HCM 2010 LOS		B

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	55	12	40	4	10	37	49	1479	20	49	1319	119
Future Volume (veh/h)	55	12	40	4	10	37	49	1479	20	49	1319	119
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	59	13	2	4	11	0	52	1573	20	52	1403	64
Adj No. of Lanes	1	1	1	1	1	1	2	3	0	1	3	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	121	127	108	34	35	30	181	2460	31	93	2417	753
Arrive On Green	0.07	0.07	0.07	0.02	0.02	0.00	0.05	0.48	0.48	0.05	0.48	0.48
Sat Flow, veh/h	1774	1863	1579	1774	1863	1583	3442	5176	66	1774	5085	1583
Grp Volume(v), veh/h	59	13	2	4	11	0	52	1030	563	52	1403	64
Grp Sat Flow(s),veh/h/ln	1774	1863	1579	1774	1863	1583	1721	1695	1851	1774	1695	1583
Q Serve(g_s), s	1.5	0.3	0.1	0.1	0.3	0.0	0.7	10.7	10.7	1.3	9.3	1.0
Cycle Q Clear(g_c), s	1.5	0.3	0.1	0.1	0.3	0.0	0.7	10.7	10.7	1.3	9.3	1.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.04	1.00		1.00
Lane Grp Cap(c), veh/h	121	127	108	34	35	30	181	1611	880	93	2417	753
V/C Ratio(X)	0.49	0.10	0.02	0.12	0.31	0.00	0.29	0.64	0.64	0.56	0.58	0.09
Avail Cap(c_a), veh/h	683	717	608	683	717	610	368	2241	1224	194	3373	1050
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	21.0	20.4	20.3	22.5	22.6	0.0	21.3	9.2	9.2	21.6	8.9	6.7
Incr Delay (d2), s/veh	3.0	0.3	0.1	1.6	4.9	0.0	0.9	0.4	0.8	5.1	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.2	0.0	0.1	0.2	0.0	0.3	5.0	5.5	0.8	4.3	0.5
LnGrp Delay(d),s/veh	24.0	20.8	20.4	24.1	27.6	0.0	22.2	9.7	10.0	26.8	9.1	6.8
LnGrp LOS	C	C	C	C	C		C	A	B	C	A	A
Approach Vol, veh/h		74			15			1645			1519	
Approach Delay, s/veh		23.4			26.6			10.2			9.6	
Approach LOS		C			C			B			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	7.0	26.7		7.7	7.0	26.7		5.4
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5
Max Green Setting (Gmax), s	5.1	30.9		18.0	5.0	31.0		18.0
Max Q Clear Time (g_c+I1), s	3.3	12.7		3.5	2.7	11.3		2.3
Green Ext Time (p_c), s	0.0	9.5		0.1	0.0	9.3		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	10.3
HCM 2010 LOS	B

Movement	EBL	EBR	NBL	NBT	SBT	SBR		
Lane Configurations								
Traffic Volume (veh/h)	131	1003	0	1577	485	0		
Future Volume (veh/h)	131	1003	0	1577	485	0		
Number	7	14	5	2	6	16		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	1863	1863	0	1863	1863	0		
Adj Flow Rate, veh/h	139	801	0	1678	516	0		
Adj No. of Lanes	1	2	0	3	3	0		
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94		
Percent Heavy Veh, %	2	2	0	2	2	0		
Cap, veh/h	630	989	0	2312	2312	0		
Arrive On Green	0.35	0.35	0.00	0.45	0.45	0.00		
Sat Flow, veh/h	1774	2787	0	5421	5421	0		
Grp Volume(v), veh/h	139	801	0	1678	516	0		
Grp Sat Flow(s),veh/h/ln	1774	1393	0	1695	1695	0		
Q Serve(g_s), s	2.6	12.3	0.0	12.7	2.9	0.0		
Cycle Q Clear(g_c), s	2.6	12.3	0.0	12.7	2.9	0.0		
Prop In Lane	1.00	1.00	0.00			0.00		
Lane Grp Cap(c), veh/h	630	989	0	2312	2312	0		
V/C Ratio(X)	0.22	0.81	0.00	0.73	0.22	0.00		
Avail Cap(c_a), veh/h	807	1268	0	2636	2636	0		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00		
Uniform Delay (d), s/veh	10.7	13.8	0.0	10.5	7.8	0.0		
Incr Delay (d2), s/veh	0.2	3.2	0.0	0.9	0.0	0.0		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	1.3	5.1	0.0	6.1	1.3	0.0		
LnGrp Delay(d),s/veh	10.8	17.0	0.0	11.4	7.9	0.0		
LnGrp LOS	B	B		B	A			
Approach Vol, veh/h	940			1678	516			
Approach Delay, s/veh	16.1			11.4	7.9			
Approach LOS	B			B	A			
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		
Phs Duration (G+Y+Rc), s		26.0		21.3		26.0		
Change Period (Y+Rc), s		4.5		4.5		4.5		
Max Green Setting (Gmax), s		24.5		21.5		24.5		
Max Q Clear Time (g_c+I1), s		14.7		14.3		4.9		
Green Ext Time (p_c), s		6.8		2.5		2.9		
Intersection Summary								
HCM 2010 Ctrl Delay			12.2					
HCM 2010 LOS			B					

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	40	75	54	139	57	13	95	581	128	57	265	51
Future Volume (veh/h)	40	75	54	139	57	13	95	581	128	57	265	51
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	43	80	24	148	61	8	101	618	30	61	282	1
Adj No. of Lanes	2	2	1	2	2	1	2	2	1	2	2	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	163	447	332	343	632	379	288	961	587	211	882	469
Arrive On Green	0.05	0.13	0.13	0.10	0.18	0.18	0.08	0.27	0.27	0.06	0.25	0.25
Sat Flow, veh/h	3442	3539	1580	3442	3539	1581	3442	3539	1582	3442	3539	1580
Grp Volume(v), veh/h	43	80	24	148	61	8	101	618	30	61	282	1
Grp Sat Flow(s),veh/h/ln	1721	1770	1580	1721	1770	1581	1721	1770	1582	1721	1770	1580
Q Serve(g_s), s	0.5	0.8	0.5	1.7	0.6	0.2	1.1	6.3	0.5	0.7	2.7	0.0
Cycle Q Clear(g_c), s	0.5	0.8	0.5	1.7	0.6	0.2	1.1	6.3	0.5	0.7	2.7	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	163	447	332	343	632	379	288	961	587	211	882	469
V/C Ratio(X)	0.26	0.18	0.07	0.43	0.10	0.02	0.35	0.64	0.05	0.29	0.32	0.00
Avail Cap(c_a), veh/h	422	1562	829	464	1605	814	422	1605	875	422	1605	792
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	18.7	15.9	12.9	17.3	14.0	11.8	17.6	13.1	8.2	18.3	12.5	10.1
Incr Delay (d2), s/veh	0.9	0.2	0.1	0.9	0.1	0.0	0.7	0.7	0.0	0.8	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.4	0.2	0.8	0.3	0.1	0.6	3.1	0.2	0.3	1.3	0.0
LnGrp Delay(d),s/veh	19.6	16.1	13.0	18.1	14.1	11.9	18.4	13.8	8.3	19.1	12.7	10.1
LnGrp LOS	B	B	B	B	B	B	B	B	A	B	B	B
Approach Vol, veh/h		147			217			749			344	
Approach Delay, s/veh		16.6			16.8			14.2			13.8	
Approach LOS		B			B			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.0	15.6	8.6	9.6	7.9	14.7	6.4	11.8
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	5.0	18.5	5.5	18.0	5.0	18.5	5.0	18.5
Max Q Clear Time (g_c+I1), s	2.7	8.3	3.7	2.8	3.1	4.7	2.5	2.6
Green Ext Time (p_c), s	0.0	2.7	0.1	0.3	0.0	1.2	0.0	0.2

Intersection Summary	
HCM 2010 Ctrl Delay	14.7
HCM 2010 LOS	B

Intersection	
Int Delay, s/veh	1.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	3	3	23	1	30	1	423	49	55	272	4
Future Vol, veh/h	1	3	3	23	1	30	1	423	49	55	272	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	Stop	-	-	Stop	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	3	3	24	1	32	1	450	52	59	289	4

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	888	913	291	889	889	476	293	0	0	502	0	0
Stage 1	409	409	-	478	478	-	-	-	-	-	-	-
Stage 2	479	504	-	411	411	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	264	273	748	264	282	589	1269	-	-	1062	-	-
Stage 1	619	596	-	568	556	-	-	-	-	-	-	-
Stage 2	568	541	-	618	595	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	236	255	748	247	263	589	1269	-	-	1062	-	-
Mov Cap-2 Maneuver	236	255	-	247	263	-	-	-	-	-	-	-
Stage 1	618	557	-	567	555	-	-	-	-	-	-	-
Stage 2	536	540	-	571	556	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	13.4	12.2	0	1.4
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1269	-	-	437	557	1062	-	-
HCM Lane V/C Ratio	0.001	-	-	0.017	0.103	0.055	-	-
HCM Control Delay (s)	7.8	0	-	13.4	12.2	8.6	0	-
HCM Lane LOS	A	A	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0.3	0.2	-	-

Intersection	
Int Delay, s/veh	3.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	113	0	16	0	484	23	10	285	0
Future Vol, veh/h	0	0	0	113	0	16	0	484	23	10	285	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	Stop	-	-	None	-	-	None
Storage Length	-	-	-	0	-	-	0	-	-	50	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	120	0	17	0	515	24	11	303	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	852	864	303	852	852	527	303	0	0	539	0	0
Stage 1	325	325	-	527	527	-	-	-	-	-	-	-
Stage 2	527	539	-	325	325	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	280	292	737	280	297	551	1258	-	-	1029	-	-
Stage 1	687	649	-	535	528	-	-	-	-	-	-	-
Stage 2	535	522	-	687	649	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	269	289	737	278	294	551	1258	-	-	1029	-	-
Mov Cap-2 Maneuver	269	289	-	278	294	-	-	-	-	-	-	-
Stage 1	687	642	-	535	528	-	-	-	-	-	-	-
Stage 2	518	522	-	680	642	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	26.2	0	0.3
HCM LOS	A	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1258	-	-	-	278	317	1029	-	-
HCM Lane V/C Ratio	-	-	-	-	0.432	0.054	0.01	-	-
HCM Control Delay (s)	0	-	-	0	27.5	17	8.5	-	-
HCM Lane LOS	A	-	-	A	D	C	A	-	-
HCM 95th %tile Q(veh)	0	-	-	-	2.1	0.2	0	-	-

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	2039	1062	18	0	32
Future Vol, veh/h	0	2039	1062	18	0	32
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	2169	1130	19	0	34

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	575
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.32
Pot Cap-1 Maneuver	0	-	-	-	0	461
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	-	461
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	13.4
HCM LOS			B

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	461
HCM Lane V/C Ratio	-	-	-	0.074
HCM Control Delay (s)	-	-	-	13.4
HCM Lane LOS	-	-	-	B
HCM 95th %tile Q(veh)	-	-	-	0.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	27	736	173	132	1377	429	185	160	77	415	372	38
Future Volume (veh/h)	27	736	173	132	1377	429	185	160	77	415	372	38
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.95	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	29	783	89	140	1465	241	197	170	28	441	396	25
Adj No. of Lanes	1	2	1	1	3	1	2	2	1	2	2	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	56	1084	473	178	1907	580	303	481	205	563	714	45
Arrive On Green	0.03	0.31	0.31	0.10	0.38	0.38	0.09	0.14	0.14	0.16	0.21	0.21
Sat Flow, veh/h	1774	3539	1545	1774	5085	1548	3442	3539	1510	3442	3377	212
Grp Volume(v), veh/h	29	783	89	140	1465	241	197	170	28	441	207	214
Grp Sat Flow(s),veh/h/ln	1774	1770	1545	1774	1695	1548	1721	1770	1510	1721	1770	1820
Q Serve(g_s), s	1.0	12.1	2.6	4.7	15.5	7.1	3.4	2.7	1.0	7.5	6.4	6.4
Cycle Q Clear(g_c), s	1.0	12.1	2.6	4.7	15.5	7.1	3.4	2.7	1.0	7.5	6.4	6.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.12
Lane Grp Cap(c), veh/h	56	1084	473	178	1907	580	303	481	205	563	374	385
V/C Ratio(X)	0.51	0.72	0.19	0.79	0.77	0.42	0.65	0.35	0.14	0.78	0.55	0.56
Avail Cap(c_a), veh/h	145	1248	545	258	2117	644	500	1098	469	702	653	672
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	29.2	18.9	15.6	26.9	16.8	14.2	27.0	24.0	23.3	24.6	21.6	21.6
Incr Delay (d2), s/veh	7.1	1.8	0.2	9.5	1.6	0.5	2.4	0.4	0.3	4.6	1.3	1.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	6.1	1.1	2.8	7.5	3.0	1.7	1.3	0.4	3.9	3.2	3.3
LnGrp Delay(d),s/veh	36.3	20.7	15.8	36.4	18.4	14.6	29.4	24.5	23.6	29.2	22.8	22.9
LnGrp LOS	D	C	B	D	B	B	C	C	C	C	C	C
Approach Vol, veh/h		901			1846			395			862	
Approach Delay, s/veh		20.7			19.3			26.9			26.1	
Approach LOS		C			B			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.5	12.8	10.7	23.3	9.9	17.4	6.4	27.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	12.5	19.0	8.9	21.6	8.9	22.6	5.0	25.5
Max Q Clear Time (g_c+I1), s	9.5	4.7	6.7	14.1	5.4	8.4	3.0	17.5
Green Ext Time (p_c), s	0.5	0.8	0.1	2.9	0.2	1.8	0.0	5.5

Intersection Summary	
HCM 2010 Ctrl Delay	21.8
HCM 2010 LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1115	145	270	1663	10	350	3	211	6	1	4
Future Volume (veh/h)	0	1115	145	270	1663	10	350	3	211	6	1	4
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	0	1186	144	287	1769	7	372	3	83	6	1	1
Adj No. of Lanes	2	2	0	2	2	1	2	1	0	1	2	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	5	1485	180	390	2286	1038	522	8	226	18	36	0
Arrive On Green	0.00	0.47	0.47	0.11	0.65	0.65	0.15	0.15	0.15	0.01	0.01	0.01
Sat Flow, veh/h	3442	3179	385	3442	3539	1582	3548	56	1536	1774	3539	1583
Grp Volume(v), veh/h	0	659	671	287	1769	7	372	0	86	6	1	1
Grp Sat Flow(s),veh/h/ln	1721	1770	1794	1721	1770	1582	1774	0	1592	1774	1770	1583
Q Serve(g_s), s	0.0	21.7	21.9	5.5	24.3	0.1	6.9	0.0	3.3	0.2	0.0	0.7
Cycle Q Clear(g_c), s	0.0	21.7	21.9	5.5	24.3	0.1	6.9	0.0	3.3	0.2	0.0	0.7
Prop In Lane	1.00		0.21	1.00		1.00	1.00		0.97	1.00		1.00
Lane Grp Cap(c), veh/h	5	827	838	390	2286	1038	522	0	234	18	36	-87
V/C Ratio(X)	0.00	0.80	0.80	0.74	0.77	0.01	0.71	0.00	0.37	0.33	0.03	-0.01
Avail Cap(c_a), veh/h	251	1160	1176	526	2603	1180	956	0	429	465	928	311
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	15.5	15.6	29.5	8.6	4.1	27.9	0.0	26.4	33.7	33.6	0.0
Incr Delay (d2), s/veh	0.0	2.7	2.7	3.6	1.3	0.0	1.8	0.0	1.0	10.1	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	11.0	11.3	2.8	12.0	0.0	3.5	0.0	1.5	0.2	0.0	0.0
LnGrp Delay(d),s/veh	0.0	18.2	18.3	33.0	9.9	4.1	29.7	0.0	27.4	43.8	33.9	0.0
LnGrp LOS		B	B	C	A	A	C		C	D	C	
Approach Vol, veh/h		1330			2063			458			8	
Approach Delay, s/veh		18.3			13.1			29.3			37.1	
Approach LOS		B			B			C			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		14.6	12.3	36.6		5.2	0.0	48.9
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		18.5	10.5	45.0		18.0	5.0	50.5
Max Q Clear Time (g_c+I1), s		8.9	7.5	23.9		2.7	0.0	26.3
Green Ext Time (p_c), s		1.2	0.3	8.2		0.0	0.0	13.8

Intersection Summary	
HCM 2010 Ctrl Delay	16.9
HCM 2010 LOS	B

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	147	1105	37	119	1700	100	29	85	49	159	153	236
Future Volume (veh/h)	147	1105	37	119	1700	100	29	85	49	159	153	236
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	156	1176	23	127	1809	61	31	90	21	169	163	97
Adj No. of Lanes	1	2	1	1	2	1	1	1	1	1	1	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	189	1981	882	160	1923	856	215	366	310	280	366	310
Arrive On Green	0.11	0.56	0.56	0.09	0.54	0.54	0.20	0.20	0.20	0.20	0.20	0.20
Sat Flow, veh/h	1774	3539	1576	1774	3539	1576	1113	1863	1578	1274	1863	1578
Grp Volume(v), veh/h	156	1176	23	127	1809	61	31	90	21	169	163	97
Grp Sat Flow(s),veh/h/ln	1774	1770	1576	1774	1770	1576	1113	1863	1578	1274	1863	1578
Q Serve(g_s), s	7.6	19.2	0.6	6.2	41.9	1.6	2.2	3.6	1.0	11.3	6.8	4.6
Cycle Q Clear(g_c), s	7.6	19.2	0.6	6.2	41.9	1.6	9.0	3.6	1.0	14.9	6.8	4.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	189	1981	882	160	1923	856	215	366	310	280	366	310
V/C Ratio(X)	0.83	0.59	0.03	0.80	0.94	0.07	0.14	0.25	0.07	0.60	0.45	0.31
Avail Cap(c_a), veh/h	192	1981	882	263	1954	870	231	392	333	298	392	333
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	38.4	12.7	8.6	39.2	18.7	9.5	35.0	29.8	28.7	36.1	31.1	30.2
Incr Delay (d2), s/veh	24.3	0.5	0.0	8.7	9.6	0.0	0.3	0.3	0.1	3.1	0.9	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.0	9.4	0.3	3.4	22.9	0.7	0.7	1.9	0.4	4.2	3.6	2.1
LnGrp Delay(d),s/veh	62.8	13.2	8.6	47.9	28.4	9.6	35.3	30.1	28.8	39.2	31.9	30.8
LnGrp LOS	E	B	A	D	C	A	D	C	C	D	C	C
Approach Vol, veh/h		1355			1997			142			429	
Approach Delay, s/veh		18.8			29.0			31.1			34.5	
Approach LOS		B			C			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		21.8	12.4	53.7		21.8	13.9	52.2
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		18.5	13.0	45.0		18.5	9.5	48.5
Max Q Clear Time (g_c+I1), s		11.0	8.2	21.2		16.9	9.6	43.9
Green Ext Time (p_c), s		0.3	0.1	8.1		0.3	0.0	3.8

Intersection Summary	
HCM 2010 Ctrl Delay	26.2
HCM 2010 LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	131	1207	40	258	1976	134	38	80	224	89	88	151
Future Volume (veh/h)	131	1207	40	258	1976	134	38	80	224	89	88	151
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	139	1284	39	274	2102	94	40	85	85	95	94	58
Adj No. of Lanes	1	3	0	1	2	1	1	2	0	1	2	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	158	2693	82	313	2189	978	210	267	239	200	327	188
Arrive On Green	0.09	0.53	0.53	0.18	0.62	0.62	0.15	0.15	0.15	0.15	0.15	0.15
Sat Flow, veh/h	1774	5072	154	1774	3539	1582	1228	1770	1580	1209	2166	1244
Grp Volume(v), veh/h	139	858	465	274	2102	94	40	85	85	95	76	76
Grp Sat Flow(s),veh/h/ln	1774	1695	1835	1774	1770	1582	1228	1770	1580	1209	1770	1640
Q Serve(g_s), s	7.4	15.2	15.2	14.4	53.3	2.3	2.9	4.1	4.6	7.3	3.6	4.0
Cycle Q Clear(g_c), s	7.4	15.2	15.2	14.4	53.3	2.3	6.8	4.1	4.6	11.9	3.6	4.0
Prop In Lane	1.00		0.08	1.00		1.00	1.00		1.00	1.00		0.76
Lane Grp Cap(c), veh/h	158	1800	975	313	2189	978	210	267	239	200	267	248
V/C Ratio(X)	0.88	0.48	0.48	0.87	0.96	0.10	0.19	0.32	0.36	0.48	0.28	0.31
Avail Cap(c_a), veh/h	158	1800	975	476	2206	986	262	343	306	251	343	318
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	43.0	14.1	14.1	38.3	17.1	7.4	39.1	36.1	36.4	41.7	35.9	36.1
Incr Delay (d2), s/veh	39.3	0.2	0.4	11.2	11.3	0.0	0.4	0.7	0.9	1.8	0.6	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.4	7.1	7.7	8.0	29.1	1.0	1.0	2.1	2.1	2.5	1.8	1.9
LnGrp Delay(d),s/veh	82.3	14.3	14.4	49.5	28.4	7.4	39.6	36.8	37.3	43.5	36.5	36.8
LnGrp LOS	F	B	B	D	C	A	D	D	D	D	D	D
Approach Vol, veh/h		1462			2470			210			247	
Approach Delay, s/veh		20.8			29.9			37.5			39.3	
Approach LOS		C			C			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		18.9	21.4	55.2		18.9	13.0	63.6
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		18.5	25.6	42.4		18.5	8.5	59.5
Max Q Clear Time (g_c+I1), s		8.8	16.4	17.2		13.9	9.4	55.3
Green Ext Time (p_c), s		0.6	0.5	8.6		0.4	0.0	3.8

Intersection Summary		
HCM 2010 Ctrl Delay		27.8
HCM 2010 LOS		C

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	162	1363	2123	160	151	245
Future Volume (veh/h)	162	1363	2123	160	151	245
Number	7	4	8	18	1	16
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1900	1863	1863
Adj Flow Rate, veh/h	172	1450	2259	161	161	243
Adj No. of Lanes	1	3	3	0	2	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	172	3301	3148	222	672	309
Arrive On Green	0.65	0.65	0.65	0.65	0.20	0.20
Sat Flow, veh/h	142	5253	5018	342	3442	1583
Grp Volume(v), veh/h	172	1450	1572	848	161	243
Grp Sat Flow(s),veh/h/ln	142	1695	1695	1802	1721	1583
Q Serve(g_s), s	19.5	8.1	17.5	18.0	2.3	8.4
Cycle Q Clear(g_c), s	37.5	8.1	17.5	18.0	2.3	8.4
Prop In Lane	1.00			0.19	1.00	1.00
Lane Grp Cap(c), veh/h	172	3301	2200	1170	672	309
V/C Ratio(X)	1.00	0.44	0.71	0.72	0.24	0.79
Avail Cap(c_a), veh/h	172	3301	2200	1170	1102	507
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.2	5.0	6.6	6.7	19.6	22.1
Incr Delay (d2), s/veh	67.9	0.1	1.1	2.3	0.2	4.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.9	3.7	8.2	9.4	1.1	4.0
LnGrp Delay(d),s/veh	94.0	5.1	7.8	9.0	19.8	26.5
LnGrp LOS	F	A	A	A	B	C
Approach Vol, veh/h		1622	2420		404	
Approach Delay, s/veh		14.5	8.2		23.9	
Approach LOS		B	A		C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs				4		6		8
Phs Duration (G+Y+Rc), s				42.0		15.8		42.0
Change Period (Y+Rc), s				4.5		4.5		4.5
Max Green Setting (Gmax), s				37.5		18.5		37.5
Max Q Clear Time (g_c+I1), s				39.5		10.4		20.0
Green Ext Time (p_c), s				0.0		0.9		13.7

Intersection Summary	
HCM 2010 Ctrl Delay	11.9
HCM 2010 LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	64	1438	7	102	2172	568	1	4	20	466	4	108
Future Volume (veh/h)	64	1438	7	102	2172	568	1	4	20	466	4	108
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1900	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	68	1530	6	109	2311	353	1	4	6	499	0	84
Adj No. of Lanes	1	3	0	1	3	1	0	1	0	2	0	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	195	2660	10	301	2633	817	3	13	19	628	0	279
Arrive On Green	0.05	0.51	0.51	0.06	0.52	0.52	0.02	0.02	0.02	0.18	0.00	0.18
Sat Flow, veh/h	1774	5228	21	1774	5085	1579	153	610	916	3548	0	1575
Grp Volume(v), veh/h	68	992	544	109	2311	353	11	0	0	499	0	84
Grp Sat Flow(s),veh/h/ln	1774	1695	1859	1774	1695	1579	1678	0	0	1774	0	1575
Q Serve(g_s), s	1.3	15.6	15.6	2.2	30.8	10.7	0.5	0.0	0.0	10.3	0.0	3.6
Cycle Q Clear(g_c), s	1.3	15.6	15.6	2.2	30.8	10.7	0.5	0.0	0.0	10.3	0.0	3.6
Prop In Lane	1.00		0.01	1.00		1.00	0.09		0.55	1.00		1.00
Lane Grp Cap(c), veh/h	195	1725	946	301	2633	817	35	0	0	628	0	279
V/C Ratio(X)	0.35	0.58	0.58	0.36	0.88	0.43	0.32	0.00	0.00	0.79	0.00	0.30
Avail Cap(c_a), veh/h	222	1725	946	352	2685	834	405	0	0	833	0	370
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	16.9	13.1	13.1	10.0	16.4	11.5	37.0	0.0	0.0	30.2	0.0	27.4
Incr Delay (d2), s/veh	1.1	0.5	0.9	0.7	3.6	0.4	5.1	0.0	0.0	3.9	0.0	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	7.3	8.1	1.1	15.0	4.7	0.3	0.0	0.0	5.4	0.0	1.6
LnGrp Delay(d),s/veh	17.9	13.6	13.9	10.7	20.0	11.9	42.1	0.0	0.0	34.2	0.0	28.0
LnGrp LOS	B	B	B	B	B	B	D			C		C
Approach Vol, veh/h		1604			2773			11			583	
Approach Delay, s/veh		13.9			18.6			42.1			33.3	
Approach LOS		B			B			D			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		6.1	9.0	43.5		18.1	8.3	44.2
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		18.5	6.7	38.8		18.0	5.0	40.5
Max Q Clear Time (g_c+I1), s		2.5	4.2	17.6		12.3	3.3	32.8
Green Ext Time (p_c), s		0.0	0.0	9.6		1.1	0.0	6.9

Intersection Summary	
HCM 2010 Ctrl Delay	18.8
HCM 2010 LOS	B

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	262	1051	640	265	1644	879	902	1171	117	774	1414	251
Future Volume (veh/h)	262	1051	640	265	1644	879	902	1171	117	774	1414	251
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.99	1.00		0.97	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	279	1118	637	282	1749	894	960	1246	55	823	1504	236
Adj No. of Lanes	2	3	1	2	3	1	2	3	1	2	3	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	234	1322	748	310	1435	844	750	1364	413	871	1341	210
Arrive On Green	0.07	0.26	0.26	0.09	0.28	0.28	0.22	0.27	0.27	0.25	0.30	0.30
Sat Flow, veh/h	3442	5085	1549	3442	5085	1570	3442	5085	1540	3442	4417	692
Grp Volume(v), veh/h	279	1118	637	282	1749	894	960	1246	55	823	1153	587
Grp Sat Flow(s),veh/h/ln	1721	1695	1549	1721	1695	1570	1721	1695	1540	1721	1695	1719
Q Serve(g_s), s	9.5	29.2	36.4	11.4	39.5	39.5	30.5	33.2	3.8	32.9	42.5	42.5
Cycle Q Clear(g_c), s	9.5	29.2	36.4	11.4	39.5	39.5	30.5	33.2	3.8	32.9	42.5	42.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.40
Lane Grp Cap(c), veh/h	234	1322	748	310	1435	844	750	1364	413	871	1029	522
V/C Ratio(X)	1.19	0.85	0.85	0.91	1.22	1.06	1.28	0.91	0.13	0.94	1.12	1.12
Avail Cap(c_a), veh/h	234	1322	748	310	1435	844	750	1364	413	895	1029	522
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	65.3	49.1	32.4	63.1	50.3	32.6	54.8	49.6	38.9	51.3	48.8	48.8
Incr Delay (d2), s/veh	121.7	5.3	9.3	29.4	105.1	48.0	136.3	9.6	0.1	17.9	67.4	78.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.5	14.3	23.5	6.7	32.4	43.6	28.7	16.8	1.6	17.8	29.5	31.5
LnGrp Delay(d),s/veh	186.9	54.4	41.7	92.5	155.3	80.6	191.1	59.3	39.0	69.2	116.2	126.9
LnGrp LOS	F	D	D	F	F	F	F	E	D	E	F	F
Approach Vol, veh/h		2034			2925			2261			2563	
Approach Delay, s/veh		68.6			126.4			114.7			103.6	
Approach LOS		E			F			F			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	39.9	42.1	17.1	40.9	35.0	47.0	14.0	44.0
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	36.4	36.6	12.6	36.4	30.5	42.5	9.5	39.5
Max Q Clear Time (g_c+I1), s	34.9	35.2	13.4	38.4	32.5	44.5	11.5	41.5
Green Ext Time (p_c), s	0.6	1.0	0.0	0.0	0.0	0.0	0.0	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	105.7
HCM 2010 LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	77	1600	262	446	2381	168	273	106	465	132	68	41
Future Volume (veh/h)	77	1600	262	446	2381	168	273	106	465	132	68	41
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.97	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	82	1702	135	474	2533	126	290	113	209	140	72	18
Adj No. of Lanes	1	3	1	1	3	1	1	1	1	1	2	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	104	1723	534	483	2808	852	363	445	372	280	674	162
Arrive On Green	0.06	0.34	0.34	0.27	0.55	0.55	0.24	0.24	0.24	0.24	0.24	0.24
Sat Flow, veh/h	1774	5085	1576	1774	5085	1544	1299	1863	1559	1052	2821	679
Grp Volume(v), veh/h	82	1702	135	474	2533	126	290	113	209	140	44	46
Grp Sat Flow(s),veh/h/ln	1774	1695	1576	1774	1695	1544	1299	1863	1559	1052	1770	1730
Q Serve(g_s), s	4.1	29.9	5.6	23.9	40.0	3.6	19.6	4.4	10.6	11.2	1.8	1.9
Cycle Q Clear(g_c), s	4.1	29.9	5.6	23.9	40.0	3.6	21.5	4.4	10.6	15.6	1.8	1.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.39
Lane Grp Cap(c), veh/h	104	1723	534	483	2808	852	363	445	372	280	423	413
V/C Ratio(X)	0.78	0.99	0.25	0.98	0.90	0.15	0.80	0.25	0.56	0.50	0.10	0.11
Avail Cap(c_a), veh/h	104	1723	534	483	2808	852	363	445	372	280	423	413
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	41.8	29.6	21.5	32.5	18.0	9.8	35.4	27.8	30.1	34.1	26.7	26.8
Incr Delay (d2), s/veh	31.4	18.7	0.2	36.0	4.5	0.1	11.8	0.3	1.9	1.4	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.9	16.9	2.4	16.6	19.7	1.5	8.4	2.3	4.8	3.4	0.9	0.9
LnGrp Delay(d),s/veh	73.2	48.3	21.8	68.6	22.5	9.9	47.3	28.0	32.0	35.5	26.8	26.9
LnGrp LOS	E	D	C	E	C	A	D	C	C	D	C	C
Approach Vol, veh/h		1919			3133			612			230	
Approach Delay, s/veh		47.5			29.0			38.5			32.1	
Approach LOS		D			C			D			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		26.0	29.0	35.0		26.0	9.8	54.2
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		21.5	24.5	30.5		21.5	5.3	49.7
Max Q Clear Time (g_c+I1), s		23.5	25.9	31.9		17.6	6.1	42.0
Green Ext Time (p_c), s		0.0	0.0	0.0		0.4	0.0	7.3

Intersection Summary	
HCM 2010 Ctrl Delay	36.1
HCM 2010 LOS	D

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1427	0	0	1916	1397	231
Future Volume (veh/h)	1427	0	0	1916	1397	231
Number	4	14	3	8	5	12
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	0	0	1863	1863	1900
Adj Flow Rate, veh/h	1518	0	0	2038	1705	0
Adj No. of Lanes	3	0	0	3	2	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	0	0	2	2	0
Cap, veh/h	2042	0	0	2042	1767	804
Arrive On Green	0.40	0.00	0.00	0.40	0.50	0.00
Sat Flow, veh/h	5421	0	0	5421	3548	1615
Grp Volume(v), veh/h	1518	0	0	2038	1705	0
Grp Sat Flow(s),veh/h/ln	1695	0	0	1695	1774	1615
Q Serve(g_s), s	22.8	0.0	0.0	35.9	41.6	0.0
Cycle Q Clear(g_c), s	22.8	0.0	0.0	35.9	41.6	0.0
Prop In Lane		0.00	0.00		1.00	1.00
Lane Grp Cap(c), veh/h	2042	0	0	2042	1767	804
V/C Ratio(X)	0.74	0.00	0.00	1.00	0.96	0.00
Avail Cap(c_a), veh/h	2042	0	0	2042	1781	811
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	22.9	0.0	0.0	26.8	21.7	0.0
Incr Delay (d2), s/veh	1.5	0.0	0.0	19.4	13.9	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	11.0	0.0	0.0	20.3	23.5	0.0
LnGrp Delay(d),s/veh	24.4	0.0	0.0	46.2	35.6	0.0
LnGrp LOS	C			D	D	
Approach Vol, veh/h	1518			2038	1705	
Approach Delay, s/veh	24.4			46.2	35.6	
Approach LOS	C			D	D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4				8
Phs Duration (G+Y+Rc), s		49.2		40.5				40.5
Change Period (Y+Rc), s		4.5		4.5				4.5
Max Green Setting (Gmax), s		45.0		36.0				36.0
Max Q Clear Time (g_c+I1), s		43.6		24.8				37.9
Green Ext Time (p_c), s		1.0		6.8				0.0

Intersection Summary	
HCM 2010 Ctrl Delay	36.5
HCM 2010 LOS	D

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	335	57	372	35	74	205	309	1935	74	170	2083	674
Future Volume (veh/h)	335	57	372	35	74	205	309	1935	74	170	2083	674
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.94	1.00		0.97	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	356	61	156	37	79	69	329	2059	75	181	2216	377
Adj No. of Lanes	1	1	1	1	1	1	2	3	0	1	3	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	381	400	334	115	121	96	366	2337	85	206	2409	738
Arrive On Green	0.21	0.21	0.21	0.07	0.07	0.07	0.11	0.46	0.46	0.12	0.47	0.47
Sat Flow, veh/h	1774	1863	1552	1774	1863	1481	3442	5032	183	1774	5085	1557
Grp Volume(v), veh/h	356	61	156	37	79	69	329	1385	749	181	2216	377
Grp Sat Flow(s),veh/h/ln	1774	1863	1552	1774	1863	1481	1721	1695	1824	1774	1695	1557
Q Serve(g_s), s	25.4	3.4	11.3	2.6	5.3	5.9	12.2	47.6	48.0	12.9	52.3	21.6
Cycle Q Clear(g_c), s	25.4	3.4	11.3	2.6	5.3	5.9	12.2	47.6	48.0	12.9	52.3	21.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.10	1.00		1.00
Lane Grp Cap(c), veh/h	381	400	334	115	121	96	366	1574	847	206	2409	738
V/C Ratio(X)	0.93	0.15	0.47	0.32	0.65	0.72	0.90	0.88	0.88	0.88	0.92	0.51
Avail Cap(c_a), veh/h	393	412	344	248	260	207	366	1591	856	208	2441	747
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	49.6	41.0	44.1	57.5	58.8	59.0	56.8	31.2	31.3	56.0	31.6	23.5
Incr Delay (d2), s/veh	28.8	0.2	1.0	1.6	5.8	9.5	23.9	6.0	10.8	32.1	6.2	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	15.5	1.8	5.0	1.3	2.9	2.7	7.0	23.4	26.7	8.2	25.8	9.4
LnGrp Delay(d),s/veh	78.5	41.2	45.1	59.1	64.6	68.5	80.8	37.2	42.1	88.2	37.8	24.1
LnGrp LOS	E	D	D	E	E	E	F	D	D	F	D	C
Approach Vol, veh/h		573			185			2463			2774	
Approach Delay, s/veh		65.4			64.9			44.5			39.2	
Approach LOS		E			E			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	19.4	64.3		32.2	18.2	65.5		12.9
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5
Max Green Setting (Gmax), s	15.1	60.4		28.5	13.7	61.8		18.0
Max Q Clear Time (g_c+I1), s	14.9	50.0		27.4	14.2	54.3		7.9
Green Ext Time (p_c), s	0.0	8.2		0.3	0.0	6.7		0.5

Intersection Summary	
HCM 2010 Ctrl Delay	44.7
HCM 2010 LOS	D

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	237	1605	0	2465	1334	0
Future Volume (veh/h)	237	1605	0	2465	1334	0
Number	7	14	5	2	6	16
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	0	1863	1863	0
Adj Flow Rate, veh/h	252	1664	0	2622	1419	0
Adj No. of Lanes	1	2	0	3	3	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	0	2	2	0
Cap, veh/h	850	1335	0	2267	2267	0
Arrive On Green	0.48	0.48	0.00	0.45	0.45	0.00
Sat Flow, veh/h	1774	2787	0	5421	5421	0
Grp Volume(v), veh/h	252	1664	0	2622	1419	0
Grp Sat Flow(s),veh/h/ln	1774	1393	0	1695	1695	0
Q Serve(g_s), s	10.3	57.5	0.0	53.5	25.7	0.0
Cycle Q Clear(g_c), s	10.3	57.5	0.0	53.5	25.7	0.0
Prop In Lane	1.00	1.00	0.00			0.00
Lane Grp Cap(c), veh/h	850	1335	0	2267	2267	0
V/C Ratio(X)	0.30	1.25	0.00	1.16	0.63	0.00
Avail Cap(c_a), veh/h	850	1335	0	2267	2267	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	19.0	31.3	0.0	33.3	25.6	0.0
Incr Delay (d2), s/veh	0.2	117.2	0.0	75.9	0.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.1	43.8	0.0	40.9	12.1	0.0
LnGrp Delay(d),s/veh	19.2	148.5	0.0	109.1	26.1	0.0
LnGrp LOS	B	F		F	C	
Approach Vol, veh/h	1916			2622	1419	
Approach Delay, s/veh	131.5			109.1	26.1	
Approach LOS	F			F	C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		
Phs Duration (G+Y+Rc), s		58.0		62.0		58.0		
Change Period (Y+Rc), s		4.5		4.5		4.5		
Max Green Setting (Gmax), s		53.5		57.5		53.5		
Max Q Clear Time (g_c+I1), s		55.5		59.5		27.7		
Green Ext Time (p_c), s		0.0		0.0		10.5		

Intersection Summary	
HCM 2010 Ctrl Delay	96.5
HCM 2010 LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	173	156	85	367	177	74	201	912	309	131	641	174
Future Volume (veh/h)	173	156	85	367	177	74	201	912	309	131	641	174
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.98	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	184	166	37	390	188	36	214	970	182	139	682	97
Adj No. of Lanes	2	2	1	2	2	1	2	2	1	2	2	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	294	356	307	517	586	382	324	1240	784	271	1186	658
Arrive On Green	0.09	0.10	0.10	0.15	0.17	0.17	0.09	0.35	0.35	0.08	0.34	0.34
Sat Flow, veh/h	3442	3539	1574	3442	3539	1554	3442	3539	1561	3442	3539	1561
Grp Volume(v), veh/h	184	166	37	390	188	36	214	970	182	139	682	97
Grp Sat Flow(s),veh/h/ln	1721	1770	1574	1721	1770	1554	1721	1770	1561	1721	1770	1561
Q Serve(g_s), s	2.9	2.5	1.1	6.1	2.6	1.0	3.4	13.8	3.7	2.2	8.9	2.2
Cycle Q Clear(g_c), s	2.9	2.5	1.1	6.1	2.6	1.0	3.4	13.8	3.7	2.2	8.9	2.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	294	356	307	517	586	382	324	1240	784	271	1186	658
V/C Ratio(X)	0.63	0.47	0.12	0.75	0.32	0.09	0.66	0.78	0.23	0.51	0.58	0.15
Avail Cap(c_a), veh/h	520	1133	653	643	1259	678	422	1479	890	306	1360	735
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	24.9	23.9	18.7	22.9	20.7	16.4	24.6	16.3	7.9	24.9	15.4	10.1
Incr Delay (d2), s/veh	2.2	0.9	0.2	4.0	0.3	0.1	2.4	2.3	0.1	1.5	0.4	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	1.3	0.5	3.2	1.3	0.4	1.7	7.1	1.6	1.1	4.4	1.0
LnGrp Delay(d),s/veh	27.0	24.8	18.8	26.9	21.0	16.5	27.0	18.7	8.1	26.4	15.8	10.2
LnGrp LOS	C	C	B	C	C	B	C	B	A	C	B	B
Approach Vol, veh/h		387			614			1366			918	
Approach Delay, s/veh		25.3			24.5			18.6			16.8	
Approach LOS		C			C			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.9	24.2	12.9	10.2	9.8	23.3	9.3	13.8
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	5.0	23.5	10.5	18.0	6.9	21.6	8.5	20.0
Max Q Clear Time (g_c+I1), s	4.2	15.8	8.1	4.5	5.4	10.9	4.9	4.6
Green Ext Time (p_c), s	0.0	3.9	0.4	0.8	0.1	3.3	0.2	0.9

Intersection Summary	
HCM 2010 Ctrl Delay	20.0
HCM 2010 LOS	B

Intersection	
Int Delay, s/veh	8.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	4	0	117	7	239	3	219	41	137	392	3
Future Vol, veh/h	1	4	0	117	7	239	3	219	41	137	392	3
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	0	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	4	0	124	7	254	3	233	44	146	417	3

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1103	994	419	974	973	255	420	0	0	277	0	0
Stage 1	711	711	-	261	261	-	-	-	-	-	-	-
Stage 2	392	283	-	713	712	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	189	245	634	231	252	784	1139	-	-	1286	-	-
Stage 1	424	436	-	744	692	-	-	-	-	-	-	-
Stage 2	633	677	-	423	436	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	110	208	634	201	214	784	1139	-	-	1286	-	-
Mov Cap-2 Maneuver	110	208	-	201	214	-	-	-	-	-	-	-
Stage 1	423	371	-	742	690	-	-	-	-	-	-	-
Stage 2	422	675	-	356	371	-	-	-	-	-	-	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	26			24.2			0.1			2.1		
HCM LOS	D			C								

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1139	-	-	177	201	729	1286	-	-
HCM Lane V/C Ratio	0.003	-	-	0.03	0.619	0.359	0.113	-	-
HCM Control Delay (s)	8.2	0	-	26	48.3	12.7	8.2	0	-
HCM Lane LOS	A	A	-	D	E	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	3.6	1.6	0.4	-	-

Intersection	
Int Delay, s/veh	2.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	69	0	10	0	265	67	30	479	0
Future Vol, veh/h	0	0	0	69	0	10	0	265	67	30	479	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	0	-	-	0	-	-	50	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	73	0	11	0	282	71	32	510	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	897	927	510	892	892	318	510	0	0	353	0	0
Stage 1	574	574	-	318	318	-	-	-	-	-	-	-
Stage 2	323	353	-	574	574	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	261	268	563	263	281	723	1055	-	-	1206	-	-
Stage 1	504	503	-	693	654	-	-	-	-	-	-	-
Stage 2	689	631	-	504	503	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	252	261	563	258	273	723	1055	-	-	1206	-	-
Mov Cap-2 Maneuver	252	261	-	258	273	-	-	-	-	-	-	-
Stage 1	504	489	-	693	654	-	-	-	-	-	-	-
Stage 2	679	631	-	491	489	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	22.6	0	0.5
HCM LOS	A	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1055	-	-	-	258	723	1206	-	-
HCM Lane V/C Ratio	-	-	-	-	0.285	0.015	0.026	-	-
HCM Control Delay (s)	0	-	-	0	24.4	10.1	8.1	-	-
HCM Lane LOS	A	-	-	A	C	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	-	1.1	0	0.1	-	-

Intersection						
Int Delay, s/veh	0.1					

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	1313	1934	52	0	20
Future Vol, veh/h	0	1313	1934	52	0	20
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	1397	2057	55	0	21

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	1056
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.32
Pot Cap-1 Maneuver	0	-	-	-	0	222
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	-	222
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	22.9
HCM LOS			C

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	222
HCM Lane V/C Ratio	-	-	-	0.096
HCM Control Delay (s)	-	-	-	22.9
HCM Lane LOS	-	-	-	C
HCM 95th %tile Q(veh)	-	-	-	0.3

APPENDIX H

BUILDOUT (2040) POST MITIGATION PEAK HOUR INTERSECTION ANALYSIS WORKSHEETS

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	378	1658	581	92	826	371	279	612	55	539	615	117
Future Volume (veh/h)	378	1658	581	92	826	371	279	612	55	539	615	117
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	402	1764	581	98	879	321	297	651	8	573	654	91
Adj No. of Lanes	2	3	1	2	3	1	2	4	1	2	3	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	488	1959	789	187	1513	769	390	984	243	649	1163	361
Arrive On Green	0.14	0.39	0.39	0.05	0.30	0.30	0.11	0.15	0.15	0.19	0.23	0.23
Sat Flow, veh/h	3442	5085	1582	3442	5085	1582	3442	6408	1580	3442	5085	1581
Grp Volume(v), veh/h	402	1764	581	98	879	321	297	651	8	573	654	91
Grp Sat Flow(s),veh/h/ln	1721	1695	1582	1721	1695	1582	1721	1602	1580	1721	1695	1581
Q Serve(g_s), s	9.3	26.9	24.0	2.3	12.1	10.8	6.9	7.9	0.4	13.4	9.4	3.9
Cycle Q Clear(g_c), s	9.3	26.9	24.0	2.3	12.1	10.8	6.9	7.9	0.4	13.4	9.4	3.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	488	1959	789	187	1513	769	390	984	243	649	1163	361
V/C Ratio(X)	0.82	0.90	0.74	0.52	0.58	0.42	0.76	0.66	0.03	0.88	0.56	0.25
Avail Cap(c_a), veh/h	568	1982	796	209	1513	769	589	1470	363	669	1284	399
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	34.3	23.8	16.4	37.9	24.6	13.6	35.4	32.8	29.7	32.5	28.1	26.0
Incr Delay (d2), s/veh	8.4	6.1	3.6	2.3	0.6	0.4	3.2	0.8	0.1	13.1	0.5	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.0	13.7	11.2	1.1	5.7	4.7	3.4	3.5	0.2	7.5	4.4	1.7
LnGrp Delay(d),s/veh	42.7	29.9	19.9	40.2	25.1	14.0	38.6	33.6	29.7	45.6	28.6	26.4
LnGrp LOS	D	C	B	D	C	B	D	C	C	D	C	C
Approach Vol, veh/h		2747			1298			956			1318	
Approach Delay, s/veh		29.7			23.5			35.1			35.8	
Approach LOS		C			C			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	20.0	17.1	9.0	36.2	13.8	23.3	16.2	29.0
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	16.0	18.9	5.0	32.1	14.1	20.8	13.6	23.5
Max Q Clear Time (g_c+I1), s	15.4	9.9	4.3	28.9	8.9	11.4	11.3	14.1
Green Ext Time (p_c), s	0.2	2.6	0.0	2.8	0.5	2.9	0.3	4.3

Intersection Summary	
HCM 2010 Ctrl Delay	30.5
HCM 2010 LOS	C

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	131	1003	0	1577	485	0
Future Volume (veh/h)	131	1003	0	1577	485	0
Number	7	14	5	2	6	16
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	0	1863	1863	0
Adj Flow Rate, veh/h	139	1067	0	1678	516	0
Adj No. of Lanes	1	2	0	5	5	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	0	2	2	0
Cap, veh/h	710	1268	0	2858	2858	0
Arrive On Green	0.40	0.40	0.00	0.38	0.38	0.00
Sat Flow, veh/h	1774	3167	0	8252	8252	0
Grp Volume(v), veh/h	139	1067	0	1678	516	0
Grp Sat Flow(s),veh/h/ln	1774	1583	0	1509	1509	0
Q Serve(g_s), s	2.1	12.4	0.0	7.2	1.9	0.0
Cycle Q Clear(g_c), s	2.1	12.4	0.0	7.2	1.9	0.0
Prop In Lane	1.00	1.00	0.00			0.00
Lane Grp Cap(c), veh/h	710	1268	0	2858	2858	0
V/C Ratio(X)	0.20	0.84	0.00	0.59	0.18	0.00
Avail Cap(c_a), veh/h	783	1398	0	3330	3330	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	8.0	11.1	0.0	10.1	8.4	0.0
Incr Delay (d2), s/veh	0.1	4.5	0.0	0.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	6.1	0.0	3.0	0.8	0.0
LnGrp Delay(d),s/veh	8.1	15.5	0.0	10.3	8.5	0.0
LnGrp LOS	A	B		B	A	
Approach Vol, veh/h	1206			1678	516	
Approach Delay, s/veh	14.7			10.3	8.5	
Approach LOS	B			B	A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		
Phs Duration (G+Y+Rc), s		19.9		20.8		19.9		
Change Period (Y+Rc), s		4.5		4.5		4.5		
Max Green Setting (Gmax), s		18.0		18.0		18.0		
Max Q Clear Time (g_c+I1), s		9.2		14.4		3.9		
Green Ext Time (p_c), s		6.2		1.9		2.6		

Intersection Summary			
HCM 2010 Ctrl Delay			11.6
HCM 2010 LOS			B

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	262	1051	640	265	1644	879	902	1171	117	774	1414	251
Future Volume (veh/h)	262	1051	640	265	1644	879	902	1171	117	774	1414	251
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.99	1.00		0.97	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	279	1118	657	282	1749	913	960	1246	20	823	1504	156
Adj No. of Lanes	2	3	1	2	3	1	2	4	1	2	4	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	252	1463	842	334	1584	893	860	1423	341	877	1454	348
Arrive On Green	0.07	0.29	0.29	0.10	0.31	0.31	0.25	0.22	0.22	0.25	0.23	0.23
Sat Flow, veh/h	3442	5085	1550	3442	5085	1571	3442	6408	1536	3442	6408	1535
Grp Volume(v), veh/h	279	1118	657	282	1749	913	960	1246	20	823	1504	156
Grp Sat Flow(s),veh/h/ln	1721	1695	1550	1721	1695	1571	1721	1602	1536	1721	1602	1535
Q Serve(g_s), s	9.5	26.1	37.4	10.5	40.5	40.5	32.5	24.4	1.3	30.4	29.5	11.4
Cycle Q Clear(g_c), s	9.5	26.1	37.4	10.5	40.5	40.5	32.5	24.4	1.3	30.4	29.5	11.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	252	1463	842	334	1584	893	860	1423	341	877	1454	348
V/C Ratio(X)	1.11	0.76	0.78	0.85	1.10	1.02	1.12	0.88	0.06	0.94	1.03	0.45
Avail Cap(c_a), veh/h	252	1463	842	363	1584	893	860	1423	341	908	1454	348
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	60.3	42.3	24.1	57.7	44.8	28.3	48.8	48.8	39.9	47.4	50.3	43.2
Incr Delay (d2), s/veh	89.2	2.5	4.8	15.7	56.7	35.9	67.6	6.4	0.1	16.6	32.9	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.6	12.5	19.9	5.7	27.2	40.7	23.5	11.5	0.6	16.5	16.4	4.9
LnGrp Delay(d),s/veh	149.5	44.7	28.9	73.4	101.5	64.2	116.4	55.3	39.9	64.1	83.2	44.1
LnGrp LOS	F	D	C	E	F	F	F	E	D	E	F	D
Approach Vol, veh/h		2054			2944			2226			2483	
Approach Delay, s/veh		53.9			87.2			81.5			74.4	
Approach LOS		D			F			F			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	37.6	33.4	17.1	41.9	37.0	34.0	14.0	45.0
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	34.3	27.7	13.7	36.3	32.5	29.5	9.5	40.5
Max Q Clear Time (g_c+I1), s	32.4	26.4	12.5	39.4	34.5	31.5	11.5	42.5
Green Ext Time (p_c), s	0.7	0.9	0.1	0.0	0.0	0.0	0.0	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	75.6
HCM 2010 LOS	E

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	237	1605	0	2465	1334	0
Future Volume (veh/h)	237	1605	0	2465	1334	0
Number	7	14	5	2	6	16
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	0	1863	1863	0
Adj Flow Rate, veh/h	252	1664	0	2622	1419	0
Adj No. of Lanes	1	2	0	5	5	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	0	2	2	0
Cap, veh/h	872	1557	0	2703	2703	0
Arrive On Green	0.49	0.49	0.00	0.36	0.36	0.00
Sat Flow, veh/h	1774	3167	0	8252	8252	0
Grp Volume(v), veh/h	252	1664	0	2622	1419	0
Grp Sat Flow(s),veh/h/ln	1774	1583	0	1509	1509	0
Q Serve(g_s), s	5.0	29.5	0.0	20.5	8.9	0.0
Cycle Q Clear(g_c), s	5.0	29.5	0.0	20.5	8.9	0.0
Prop In Lane	1.00	1.00	0.00			0.00
Lane Grp Cap(c), veh/h	872	1557	0	2703	2703	0
V/C Ratio(X)	0.29	1.07	0.00	0.97	0.52	0.00
Avail Cap(c_a), veh/h	872	1557	0	2703	2703	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	9.0	15.3	0.0	18.9	15.2	0.0
Incr Delay (d2), s/veh	0.2	43.7	0.0	11.2	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.5	22.2	0.0	10.1	3.7	0.0
LnGrp Delay(d),s/veh	9.2	58.9	0.0	30.1	15.4	0.0
LnGrp LOS	A	F		C	B	
Approach Vol, veh/h	1916			2622	1419	
Approach Delay, s/veh	52.4			30.1	15.4	
Approach LOS	D			C	B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		
Phs Duration (G+Y+Rc), s		26.0		34.0		26.0		
Change Period (Y+Rc), s		4.5		4.5		4.5		
Max Green Setting (Gmax), s		21.5		29.5		21.5		
Max Q Clear Time (g_c+I1), s		22.5		31.5		10.9		
Green Ext Time (p_c), s		0.0		0.0		6.3		

Intersection Summary	
HCM 2010 Ctrl Delay	33.8
HCM 2010 LOS	C

Notes