Print Form

Notice of Exemption 21-2025-173 Appendix E

To: Office of Planning and Research
P.O. Box 3044, Room 113
Sacramento, CA 95812-3044

County Clerk
County of: Marin
3501 Civic Center Drive, Room 234
San Rafael, CA 94903

From: (Public Agency): City of San Rafael
1400 Fifth Ave
San Rafael, CA 94901
(Address)

FILED
NOV 19 2025
SHELLY SCOTT
MARIN COUNTY CLERK
By _____ Deputy

Project Title: 1230 5th Avenue Project

Project Applicant: 1230 5th Ave Investors, LLC, 1101 5th Ave STE 300, San Rafael. CA 94901

Project Location - Specific:

1248 5th Avenue, San Rafael, CA

Project Location - City: San Rafael Project Location - County: Marin

Description of Nature, Purpose and Beneficiaries of Project:

The project consists of a multi-family housing development with 188 residential units with ground-level lobbies, amenity spaces, and 157 parking spaces at 1248 Fifth Avenue. The building will have primary frontage along Fifth Avenue and the rear along Mission Avenue. The proposal will demolish the existing one-story commercial building on the site.

Name of Public Agency Approving Project: City of San Rafael

Name of Person or Agency Carrying Out Project: 1230 5th Ave Investors, LLC, 1101 5th Ave STE 300, San Rafael. CA 94901

Exempt Status: **(check one):**

- ☐ Ministerial (Sec. 21080(b)(1); 15268);
- ☐ Declared Emergency (Sec. 21080(b)(3); 15269(a));
- ☐ Emergency Project (Sec. 21080(b)(4); 15269(b)(c));
- ☒ Categorical Exemption. State type and section number: 15332 (In-fill Development Projects)
- ☐ Statutory Exemptions. State code number: _____

Reasons why project is exempt:

As detailed in the CEQA Categorical Exemption Review Memo dated November 13, 2025, the Project meets all applicable criteria contained in Section 15532 of the CEQA Guidelines and none of the exceptions listed in Section 15300.2 apply to the Project.

Lead Agency
Contact Person: Kristina Estudillo Area Code/Telephone/Extension: (415) 458-5048

If filed by applicant:

1. Attach certified document of exemption finding.
2. Has a Notice of Exemption been filed by the public agency approving the project? Yes No

Signature: Kristina Estudillo Date: 11/19/2025 Title: Principal Planner

▪ Signed by Lead Agency Signed by Applicant

Authority cited: Sections 21083 and 21110, Public Resources Code.
Reference: Sections 21108, 21152, and 21152.1, Public Resources Code.

Date Received for filing at OPR: _____

Revised 2011

POSTED 11/19/25 TO 12/19/25

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m-group

November 13, 2025

Micah Hinkle
Director
Community & Economic Development
City of San Rafael

Subject: **1230 5th Ave Project**
1248 5th Ave (APN 011-300-26)
California Environmental Quality Act (CEQA)
Categorical Exemption Review Memorandum

Dear Micah:

As requested, we have conducted environmental review in compliance with CEQA Guidelines Section 15061 (Review for Exemption) for the 1230 5th Ave Project in San Rafael. Based on the findings of this review, we conclude that the project qualifies for exemption from CEQA pursuant to CEQA Guidelines Section 15332 (Class 32 In-fill Development Projects). The following provides a description of the project, analyzes the project's applicability for use of the categorical exemption, and discusses whether any of the exceptions to the use of the categorical exemption apply to the project. The analysis contained in this memo relies on information provided by the applicant, the applicant's technical consultants, and peer reviews by technical subconsultants, including:

- Traffic Impact Study, Kimley-Horn and Associates, September 12, 2025
- Noise and Vibration Assessment, Illingworth & Rodkin Inc, October 29, 2024, revised November 7, 2025
- Air Quality Assessment, Illingworth & Rodkin Inc, July 9, 2025, revised October 31, 2025
- Stormwater Control Plan, KSR Civil Engineering, October 30, 2024

PROJECT DESCRIPTION

Overview

The project site is located at 1248 5th Avenue (APN: 011-300-26) at the northeast corner of Fifth Avenue and C Street in San Rafael, California and comprises a total area of 28,341 square feet (0.65 acres). The project site has several existing recorded easements including access and parking, nonbuilding, Pacific Gas & Electric (PG&E), and utility easements. Access and parking easements will be maintained as part of the project for continued use by residents of the adjacent development (Boyd Court). Current development on the site includes an 11,000 square foot commercial building, surface parking, and other site improvements. These existing site improvements will be demolished to accommodate construction of a new, thirteen-story multi-family residential building containing a gross floor area of 259,946 square feet, inclusive of 199,281 square feet of residential space and 60,665 square feet allocated for a parking garage, trash and recycling areas, mechanical, electrical, and plumbing (MEP) areas, and fire suppression support areas. Floors 1 through 3 include parking, mechanical, and trash areas, floors 4 through 13 include residential units and amenities.

General Plan and Zoning

The Project site has a General Plan land use designation of Downtown Mixed Use which corresponds to properties in Downtown San Rafael. The lack of an established residential density limit is intended to provide greater flexibility in housing types, encourage smaller units, and maximize housing opportunities. As shown on Figure 4.5 of the Downtown Precise Plan, the northern portion of the site is zoned T4 Neighborhood (T4N) 40/50, which is intended to be a walkable neighborhood environment of small-to-medium footprint, moderate-intensity mixed-use buildings and housing choices, supporting and within short walking distance of neighborhood-serving retail and services. The southern portion of the site is zoned T5 Neighborhood (T5N) 40/60 which is intended to be a walkable neighborhood environment of large footprint, high-intensity mixed-use buildings, supporting and within short walking distance of neighborhood shopping, services, and transit.

Residential Uses

The project includes 188 residential units, including 125 base density units and 63 density bonus units. Of the 188 units, 19 will be available to very low-income households (15% of the 125 base density units), and are therefore afforded a 50% density bonus (63 density bonus units) under State Density Bonus Law (California Government Code Sections 65915 – 65918). Based on the percentage and level of affordability of the below market rate (BMR) units, the project is eligible for 3 concessions and unlimited waivers or reductions in development standards provided under State Density Bonus Law.[1]

Requested concessions and waivers or reductions in development standards are utilized to accommodate the proposed density bonus project, and do not inhibit the project's eligibility for a Class 32 Categorical Exemption. Residential units are dispersed on the 4th through 13th floors, with 20 units each on the 4th through 12th floors, and 8 units on the 13th floor. Common tenant amenities include a ground floor lobby and leasing office, 3rd floor fitness room and study area, 4th floor podium courtyard with lounge seating, 13th floor indoor lounge area, and a roof deck with elevated pool, pool deck, and an unprogrammed open space area. Private tenant amenities include patios and balconies.

Parking, Access, and Circulation

128 vehicle parking spaces are available for residents and guests of the proposed project and are included in an enclosed parking garage on the ground floor (38 spaces), 2nd floor (35 spaces), and 3rd floor (53 spaces), as well as 2 surface parking spaces located within the existing parking easements. Access to parking areas is provided along Fifth Avenue, C Street, and Mission Avenue. In addition to parking for the project, 7 surface parking spaces will be retained for use by residents of Boyd Court. Bicycle parking is provided between vehicle parking spaces and the wall of the building on the ground floor and 2nd floor. Additionally, 5 bicycle racks accommodating 2 bicycles each are located within the public right-of-way along Fifth Avenue. Primary pedestrian access to the site is provided along Fifth Avenue.

Table 1: Vehicle and Bicycle Parking Summary[2]

[1] Government Code Section 65915(d), 65915(e).
[2] 1230 5th Ave Project Plans, Trachtenberg Architects, July 25, 2025, Sheet A2.1.

Level	Vehicle Parking Spaces	Bicycle Parking Spaces
1	40	36
2	35	33
3	53	0
Other[3]	2	10
Total	**128**	**79**

Utilities and Landscaping

The proposed building will connect to existing storm drain, sanitary sewer, and water utilities contained within the Fifth Avenue and C Street rights-of-way. The project includes 3,880 square feet of landscaping, inclusive of a 950 square foot stormwater treatment facility, 26 trees (5 street trees, 10 podium level, 11 roof level), and a variety of shrubs and vines located at the street level, podium level, and roof level.

CEQA EXEMPTION APPLICABILITY

The following provides a discussion of the project's eligibility fora categorical exemption.

15332 (In-Fill Development Projects) Criteria Analysis

The Class 32 categorical exemption consists of infill-development projects that are consistent with the following:

A) The project is consistent with the applicable general plan designation and all applicable general plan policies as well as with applicable zoning designation and regulation.

General Plan

The project site is designated Downtown Mixed Use in the General Plan. This category corresponds to properties in Downtown San Rafael. It includes the highest development intensities in the city, and contains a mix of housing, office, retail, service, and public land uses. Development in this area is guided by the Downtown San Rafael Precise Plan, which includes further detail on building form, development intensity, height, and allowable uses. There is no residential density limit in the Downtown Mixed Use area. This allows for greater flexibility in terms of housing types, encourages smaller units, and maximizes housing opportunities. Height limits define the maximum building envelope on each site with this designation.

The project focuses high-density housing, including 19 units for very low-income households, within the transit-served Downtown core (General Plan Policies LU-1.3, H-3.5, M-3.1, LU-1.8, NH-1.3), thereby fulfilling goals to reduce vehicle miles traveled (VMT) and greenhouse gas emissions. The project will revitalize an underutilized commercial site, supporting a thriving mixed-use neighborhood (General Plan Policies NH-1.1, LU-2.2), maintaining pedestrian orientation through the integration of parking into an enclosed garage, dedicated bicycle facilities, and maintaining acceptable traffic flow (General Plan Policies NH-1.10, NH-1.11, M-7.3, M-7.8, M-2.5, M-2.6, CDP-4.9, CDP-4.11). The project provides

[3] Includes spaces outside of the proposed building.

on-site recreation amenities (General Plan Policies CDP-4.6, PROS-1.11, PROS-1.13), is designed to be context-sensitive and respectful of views (General Plan Policies NH-1.7, CDP-2.2, CDP-1.5), and incorporates Low Impact Development and water conservation through use of very low to moderate water use species and compliance with stormwater management requirements (General Plan Policies CDP-3.5, C-3.3, C-3.8, C-3.9). Finally, as proposed and conditioned, the project meets health, safety, and infrastructure standards for seismic safety, noise control, and connection to existing utilities (General Plan Policies C-2.4, N-1.1, N-1.2, N-1.11, CSI-4.2, CSI-4.8, CSI-4.9). As such, the project is consistent with all applicable General Plan policies.

Downtown Precise Plan

The project site is designated in the San Rafael Downtown Form-Based Code (DTFBC) as T4N 40/50 and T5N 40/60. Development in this area is guided by regulations contained in the DTBFC, which establishes regulations related to building form, development intensity, height, and allowable uses. As the project requests a Density Bonus under State Law, the project includes a "base project" that complies with applicable standards of the DTFBC and a "proposed project" that includes requests for incentives and waivers.

Base Project: The Base Project (identified on Sheet A0.2 of the project plans) includes 125 residential units, of which 15% (19 units) are affordable to very low income households. As shown on Sheet A0.2 of the plans, the base project complies with the maximum height, setbacks, vehicle and bicycle parking, and minimum civic area requirements and therefore meets all applicable regulations of the DTBFC.

Proposed Project: As described previously, the base project will provide 15% of the base density units affordable for very low-income households and is eligible for a 50% density bonus (63 units). The resulting 188 residential units[4] on approximately 0.65-acres represents a residential density of 289 dwelling units/acre.[5] To accommodate the additional density permitted under State Density Bonus Law, the applicant seeks waivers from development standards related to building and top plate height, building setbacks and stepbacks, parking setbacks, driveway and curb cut widths, minimum civic space, bike parking requirements, and frontage standards.

> **Concessions:** The applicant is utilizing one of the three available concessions for requirements associated with the affordable housing units, notably to provide compatibility with regard to balconies, location, type, and size when compared to the average unit mix of market rate units.
>
> **Waivers:** The applicant is utilizing waivers for the following development standards:
>
> - 40 foot building height limit in T5N 40/60
> - 40 foot building height limit in T4N 40/50
> - 35 foot top plate height limit in T5N 40/60
> - 35 foot top plate height limit in T4N 40/50

[4] 125 units x 50% = 62.5, rounded up = 63. 125 base density units + 63 density bonus units = 188 units.
[5] 188 units / 0.65 acres = 289.2 dwelling units/acre

- 7 foot front street façade zone setback at the T4N 40/50 portion of site
- 7 foot side street façade zone setback at the T4N 40/50 portion of site
- 5 foot side setback at the T4N 40/50 portion of site
- 15 foot rear yard setback at the T4N 40/50 portion of site
- Front and side street stepbacks above 35 feet in T5N 40/60
- Front and side street stepbacks above 35 feet in T4N 40/50
- 30 foot front street parking setback in T5N 40/60
- 25 foot front street parking setback in T4N 40/50
- 25 foot minimum side street parking setback
- 12 foot maximum driveway width
- 14 foot maximum curb cut
- Civic space requirement
- Bike parking requirement
- Forecourt frontage standard requirement

Modifications and waivers under the Density Bonus Law do not prevent a project from qualifying for a CEQA infill exemption, even if these changes deviate from existing zoning. (*Wollmer v. City of Berkeley*.)

Conclusion: The project is consistent with the Downtown Mixed Use General Plan designation as it maximizes housing opportunities on the site and, with the use of provisions contained in State Density Bonus Law, is consistent with the T4N 40/50 and T5N 40/60 DTFBC designations and regulations as it provides housing within short walking distance of neighborhood-serving retail and services.

Based on the project's consistency with the applicable general plan designation and policies, zoning designation, and zoning regulations, including through use of one concession and multiple waivers under State Density Bonus Law, the project complies with criteria 15332(a) and qualifies for use of the Class 32 categorical exemption.

B) The proposed development occurs within city limits on a project site of no more than 5 acres substantially surrounded by urban uses.

According to the Zoning Map on page A0.1 of the project plans and as shown in Figure 1, the site is adjoined on all sides by urban uses. The site is bordered to the north by Mission Avenue and Boyd Park, to the east by condominiums and the Marin Museum of Contemporary Art, to the south by Fifth Avenue and the AC Hotel, and to the west by C Street, San Rafael City Hall, and a paved parking lot. The site is 0.65-acres, which adheres to the criteria of the Class 32 exemption requiring the project to occupy no more than five acres. The project complies with criteria 15332(b) and qualifies for use of the Class 32 categorical exemption.

Figure 1: Project Vicinity[6]

C) The project site has no value, as habitat for endangered, rare or threatened species.

As shown in Figure 6-1 of the San Rafael 2040 General Plan, the project site and surrounding area has a vegetative cover of "Urban/other",[7] which is consistent with the developed nature of the site, including the existing hardscape and vacant commercial building. As shown in Figure 6-3 of the General Plan, the site is not designated as critical habitat for endangered, rare, or threatened, species.[8] While the radii of California Natural Diversity Database (CNDDB) plant and animal occurrences overlap the Downtown Precise Plan Area to the east (Figures 4.4-2 and 4.4-3 of the General Plan EIR), the project site is outside the boundaries of this overlap.[9] General Plan Policy C-1.12 calls for site-specific biological resources surveys for sites with habitat that are sensitive, rare, declining, unique, or represent a valuable biological resource. Highly urbanized sites do not represent such habitat. The existing vacant structure and trees onsite provide potential roosting and nesting habitat for bats and birds;[10] however, as shown in Figure 1, the site's features and surrounding areas do not represent value as habitat considering that they lack the ecological complexity, natural features, and

[6] Marin Map Viewer, https://www.marinmap.org/Html5Viewer/Index.html?viewer=smmdataviewer, accessed October 2025.
[7] San Rafael General Plan, Table 6-1, Page 6-5.
[8] San Rafael General Plan, Figure 6-3, Page 6-15.
[9] San Rafael General Plan EIR, Figure 4.4-2, Page 4.4-11; Figure 4.4-3, Page 4.4-18.
[10] San Rafael General Plan EIR, Table 4.4-3, Pages 4.4-19 through 4.4-24.

documented, recurring use by rare, threatened, or endangered species necessary to be considered critical, sensitive, or valuable habitat.

Furthermore, General Plan Program C-1.12A requires that sites with suitable anthropogenic habitat be surveyed for the presence of special status species following accepted protocol prior to development-related habitat removal. Additionally, General Plan Program C-1.13E requires pre-construction surveys if construction will occur during the bird nesting season. As such, consistent with these General Plan Programs and state requirements, the project is conditioned to conduct pre-construction surveys if demolition and/or tree removal will occur during roosting and nesting seasons. Given the highly disturbed nature of the site and surrounding area there is an overall lack of value as habitat for endangered, rare, or threatened species and as such, the project complies with criteria 15332(c) and qualifies for use of the Class 32 categorical exemption.

D) Approval of the project would not result in any significant effects relating to traffic, noise, air quality, or water quality.

This memorandum relies on the impact criteria contained in Appendix G of the 2025 CEQA Guidelines to evaluate whether the project would result in significant effects relating to traffic, noise, air quality, or water quality.

Traffic

Criterion A: would the project conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?

The applicant commissioned Kimley Horn to prepare a Traffic Impact Study (TIS) for the proposed project (Attachment 1), which was independently peer reviewed through the City of San Rafael Department of Public Works to evaluate potential impacts. As detailed in the TIS, the project is expected to generate 624 net new daily trips, including 30 trips during the a.m. peak hour and 33 trips during the p.m. peak hour.[11] As shown in Table 4 (Existing Plus Project Peak Hour LOS Summary) of the TIS and summarized in Table 2 below, the Mission Ave/C Street and Fifth Ave/C Street intersections will continue to operate at level of service (LOS) B, and C, respectively. This is consistent with General Plan Policy LU-1.2(a) and General Plan Policy M-2.5(a), which establish an acceptable LOS of D. The project, also complies with regulations related to vehicle, bicycle, and pedestrian access, parking, and circulation. As such, the project would not conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities.

Table 2: Existing Plus Project Peak Hour LOS Summary[12]

Study Intersection	Existing				Existing Plus Project			
	AM Peak		PM Peak		AM Peak		PM Peak	
	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay
Mission Ave/C Street	B	13.8	B	13.1	B	14.1	B	13.6

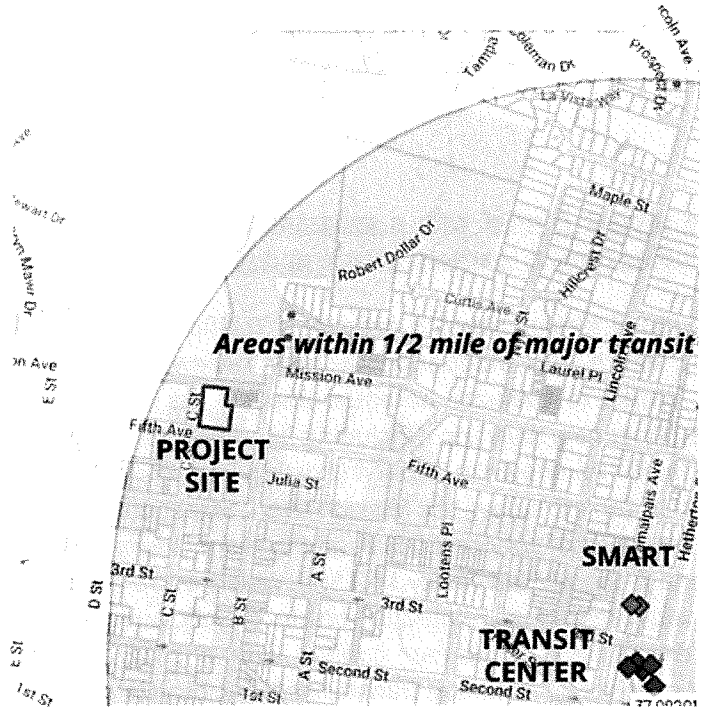
[11] Transportation Impact Study Memorandum, Kimley Horn, October 23, 2025, Table 2, Page 9.
[12] Transportation Impact Study Memorandum, Kimley Horn, October 23, 2025, Table 4, Page 13.

Fifth Ave/C Street	A	7.8	B	10.6	A	8.2	B	10.8

Criterion B: would the project conflict or be inconsistent with CEQA Guidelines Section 15064.3(b)?

The TIS determined that the project meets the criteria to be screened out from the need for a quantitative VMT analysis consistent with the City of San Rafael Transportation Analysis Guidelines.[13] This determination is based on the project meeting the following criteria: the project is located within ½ mile of the Downtown San Rafael SMART Station (see Figure 2); proposes a floor area ratio (FAR) of 9.17, which is greater than the 0.75 threshold; proposes 128 parking spaces, which does not exceed the minimum 156 required by the DTFBC;[14] and is consistent with adopted plans, including the General Plan and Downtown Precise Plan. Based on the project's location and characteristics, new residents of the project would not generate substantial VMT and the project would not conflict or be inconsistent with CEQA Guidelines Section 15064.3(b).

Figure 2: Areas within ½ mile of Major Transit (SMART and Transit Center)



Criterion C: would the project substantially increase hazards due to a geometric design feature or incompatible uses?

Vehicular access to the site will be provided on Fifth Avenue, C Street, and Mission Avenue. As detailed in the TIS, with the addition of project generated traffic, each project driveway would result in less

[13] City of San Rafael Transportation Analysis Guidelines, February 2022, Figure 1: Determining Level of Transportation Analysis and Initial VMT Screening Process

[14] Parking requirements of the DTFBC: 0.75 spaces per 1 bedroom units, 1.0 per 2 bedroom units.

than one vehicle queuing during peak hours and there are no anticipated hazards associated with excessive queuing. In addition, sight distance at the new driveway on Mission Ave is adequate in both directions to observe oncoming vehicles, bicycles, and pedestrians and exit safely. Though not required within the Downtown Precise Plan Area, consistent with recommendations of the TIS, the project will be required to maintain clear sight lines within the vision triangle. As proposed and conditioned, the project would not substantially increase hazards due to a geometric design feature or incompatible uses.

Criterion D: would the project result in inadequate emergency access? Beyond frontage improvements, including new and modified driveways and improved pedestrian facilities?

The project will not modify existing public rights-of-way such that travel lanes used by emergency vehicles would be altered and, as conditioned, will comply with fire code requirements. While the project will generate new vehicle trips, intersections will continue to operate efficiently, and emergency vehicles would not be impeded from accessing the site or surrounding area in the event of an emergency. As such, the project would not result in inadequate emergency access.

Noise

Criterion A: would the project generate 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?

As detailed in the Noise and Vibration Assessment prepared by Illingworth & Rodkin (Attachment 2), existing sources of noise include traffic on nearby roadways and mechanical equipment operating in conjunction with surrounding commercial uses.[15] Permanent sources of noise resulting from project operation include sounds associated with occupation of new residential units, use of Heating Ventilation and Air Conditioning (HVAC) units and other mechanical equipment, and additional traffic on nearby roadways. Temporary sources of noise include construction activities and emergency generator testing. A substantial noise impact would occur if the project resulted in:

- A permanent increase in ambient noise levels by more than 3 dBA Ldn in a residential area, or more than 5 dBA Ldn in a non-residential area.
- Temporary noise levels that exceed 60 dBA Leq and increase the ambient noise environment by at least 5 dBA Leq at adjacent land uses in the project vicinity for longer than one year.
- Construction activities exceeding 90 dBA Leq outside of the property plane of the project.

Permanent Increase In Ambient Noise Levels: At operation the project will contribute noise to the ambient noise environment through the introduction of new residents, operation of mechanical equipment, and project generated traffic. Noise associated with occupation of new residents would be noticeable but would not result in an increase by more than 3 dBA, which is below the threshold noted above.[16] Furthermore, consistent with Public Resources Code Section 21085, the effects of noise generated by project occupants and their guests on human beings are not considered an

[15] Noise and Vibration Assessment prepared by Illingworth & Rodkin, October 29, 2024, revised November 7, 2025 Page 11.
[16] Noise and Vibration Assessment prepared by Illingworth & Rodkin, October 29, 2024, revised November 7, 2025, Page 18.

environmental impact. The expected maximum noise level resulting from operation of mechanical equipment as measured at the edge of the roof would be a noise equivalent of 60 to 65 dBA Leq. Based on the anticipated maximum noise level of mechanical equipment, distance of the project to the nearest sensitive receptors (Boyd Court), and attenuation provided by the building and building parapet, noise levels resulting from operation of mechanical equipment would fall below ambient noise levels and would not exceed the thresholds noted above. Increases in traffic on nearby roadways would result in than a 1 dBA increase and would not exceed the thresholds noted above.[17] As such, the project would not generate a substantial permanent increase in ambient noise levels in the vicinity of the project in excess of established standards.

Temporary and Construction Noise Levels: Construction of the project is anticipated to occur over an 18-month period and is anticipated to include a range of equipment typically used for construction of residential projects. Equipment used during construction would generate average noise levels up to 84 dBA Leq and 97 dBA Lmax at the closest sensitive receptors (Boyd Court)..[18] The adjacent residential building could therefore be exposed to noise levels in excess of established standards, however consistent with General Plan Program N-1.9B, SRMC Chapter 8.13, and standard conditions of approval, the project is required to incorporate best management practices throughout construction of the project. Intermittent testing of the emergency generator is expected to generate noise levels up to 79 dBA across C Street, which is below the threshold of 90 dBA. As such, the project would not generate a substantial temporary increase in ambient noise levels in the vicinity of the project in excess of established standards.

Criterion B: would the project generate excessive groundborne vibration or groundborne noise levels? Construction activities have the potential to cause groundborne vibration through the use of construction equipment, such as vibratory rollers, that can cause annoyance to nearby occupants or structural damage to adjacent buildings?

The Federal Transportation Agency (FTA) establishes vibration-related thresholds, which are based on various structural categories.[19] As shown in Table 8 of the Noise and Vibration Assessment, project construction could generate vibration levels up to 2.2 peak particle velocity inches per second (PPV in/sec) at 5 feet (commercial building to the east) 0.29 PPV in/sec at 20 feet (Boyd Court), 0.07 PPV in/sec at 50 feet (AC Hotel), 0.01 PPV in/sec at 175 feet (Marin History Museum), and 0.002 PPV in/sec at 520 feet (Mission San Rafael). The adjacent commercial building is a modern building (FTA category I or II), and could be exposed to vibration levels exceeding the respective 0.3 and 0.5 PPV in/sec. However, consistent with General Plan Program N-1.11A, the project is subject to vibration-related conditions of approval which will ensure construction vibration does not exceed FTA thresholds.[20] The nearby Boyd Court residential building, and AC Hotel are modern buildings (FTA category II) and would

[17] Noise and Vibration Assessment prepared by Illingworth & Rodkin, October 29, 2024, revised November 7, 2025, Page 21, Table 8.
[18] Noise and Vibration Assessment prepared by Illingworth & Rodkin, October 29, 2024, revised November 7, 2025, Page 19.
[19] Noise and Vibration Assessment prepared by Illingworth & Rodkin, October 29, 2024, revised November 7, 2025, Page 10.
[20] Noise and Vibration Assessment prepared by Illingworth & Rodkin, October 29, 2024, revised November 7, 2025 Page 23 and 24.

not be exposed to vibration levels exceeding 0.3 peak particle velocity inches per second (PPV in/sec).[21] The Marin History Museum is a non-engineered timber and masonry building (FTA category III) and would not be exposed to vibration levels exceeding 0.2 PPV in/sec. Mission San Rafael is considered extremely susceptible to vibration damage (FTA category IV) and would not be exposed to vibration levels exceeding 0.12 PPV in/sec.[22] As such, the project would not generate excessive groundborne vibration or groundborne noise levels in excess of established standards.

Criterion C: for a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?

The nearest airport to the project site (San Rafael Airport) is located over 5 miles northeast. As such, the project would not expose people residing in the project area to excessive noise levels due to location within the vicinity of a private airstrip or within two miles of a public or public use airport.

Air Quality

Criterion A: would the project conflict with or obstruct implementation of the applicable air quality plan?

In 2017, the Bay Area Air Quality Management District (now the Bay Area Air District) adopted the 2017 Bay Area Clean Air Plan (CAP) and in 2022, updated their CEQA Guidelines to assist local agencies in evaluating air quality impacts of projects. As detailed in Section 5.1.2 of the 2022 BAAQMD/BAAD CEQA Guidelines, a project would not conflict with an air quality plan if it (1) supports the primary goals of the plan, (2) includes all applicable control measures, and (3) does not disrupt or hinder implementation of any control measures.[23] The project is consistent with the 2017 Bay Area Clean Air Plan (CAP) as it supports the primary goal of the CAP, which is to protect public health and the climate by reducing GHG emissions. The Project supports this goal by locating new residential uses within walking and biking distance of transit, goods, and services, thereby reducing reliance on single-occupancy vehicles which reduces GHG emissions associated with driving. Additionally, the project will be all electric and will therefore not contribute to GHG emissions associated with use of natural gas appliances. As a standard condition of approval, and as required by General Plan Program C-2.4A, the project will be conditioned to incorporate control measures during construction. Lastly, the Project does not hinder or disrupt any of the stationary source, transportation, building, energy, agriculture, natural and working lands, waste, water, or super-GHG pollutants control measures contained in the 2017 Bay Area CAP. As such, the project would not conflict with or obstruct implementation of the applicable air quality plan.

[21] Noise and Vibration Assessment prepared by Illingworth & Rodkin, October 29, 2024, revised November 7, 2025, Page 21, Tale 8.
[22] Noise and Vibration Assessment prepared by Illingworth & Rodkin, October 29, 2024, revised November 7, 2025, Page 21, Tale 8.
[23] Bay Area Air Quality Management District 2022 CEQA Guidelines, Section 5.1.2 (Impact Analysis), Page 5-2.

Criterion B: would the project 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?

A project-specific Air Quality Assessment was prepared for the project by Illingworth and Rodkin on July 9, 2025 (Attachment 3). Construction- and operation-related emissions were quantified using the California Emissions Estimator Model (CalEEMod). Quantified construction and operational emissions are shown in Table 1 and Table 2 below, respectively. As demonstrated below, both construction- and operation-related emissions will be below BAAQMD/BAADs thresholds of significance. Additionally, consistent with the Air District's recommendations and General Plan policies, BMPs will be incorporated throughout project construction to control for fugitive dust. Therefore, the project would not result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard.

Table 3: Construction Emissions[24]

Year	ROG	NOx	PM10 Exhaust	PM2.5 Exhaust
Construction Emissions Per Year (Tons)				
2026	0.37	0.43	0.01	0.01
2027	1.12	0.12	0.003	0.003
Average Daily Construction Emissions Per Year (pounds/day)				
2026 (261 workdays)	2.86	3.33	0.09	0.08
2027 (153 workdays)	14.59	1.55	0.04	0.03
BAAQMD/BAAD Threshold (pounds/day)	54 lbs/day	54 lbs/day	82 lbs/day	54 lbs/day
Exceeds Threshold?	**No**	**No**	**No**	**No**

Table 4: Operation Emissions[25]

Year	ROG	NOx	PM10 Exhaust	PM2.5 Exhaust
2028 Operation Emissions (tons/year)	1.49	0.39	0.63	0.17
BAAQMD/BAAD Threshold (tons/year)	10 tons	10 tons	15 tons	10 tons
Exceeds Threshold?	**No**	**No**	**No**	**No**
2025 Daily OperationEmissions (pounds/day)	8.17	2.12	3.46	0.93
BAAQMD/BAAD Threshold (tons/year)	54 lbs	54 lbs	82 lbs	54 lbs
Exceeds Threshold?	**No**	**No**	**No**	**No**

[24] Air Quality Assessment, Illingworth & Rodkin, July 9, 2025, revised October 31, 2025, Table 3, Page 10.
[25] Air Quality Assessment, Illingworth & Rodkin, July 9, 2025, revised October 31, 2025, Table 4, Page 13.

Criterion C: would the project expose sensitive receptors to substantial pollutant concentrations?

Consistent with General Plan Policy C-2.2 (Land Use Compatibility and Building Standards), Program C-2.2A (Protection of Sensitive Receptors), and recommendations of the Bay Area Air District, and based on the adjacency of the project to existing residents (Boyd Court), the project will be conditioned to either prepare a construction health risk assessment, or incorporate enhanced BMPs during construction, including verified diesel emission control strategies and implementation of a construction minimization plan, which are capable of reducing potential cancer and non-cancer risks to a level below ten in one million or a hazard index of 1.0. Through compliance with applicable General Plan Policies, Programs, project conditions of approval, and implementation of basic and enhanced BMPS, the project will not expose sensitive receptors to substantial pollutant concentrations.

Criterion D: would the project result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?

There are no components of the project that would generate other emissions, such as those leading to odors that would adversely affect a substantial number of people.

Water Quality

Criterion A: would the project violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?

A Stormwater Quality Control Plan was prepared for the project by KSR Civil Engineering on October 30, 2024 (Attachment 4) and outlines methods for managing stormwater onsite. The report concludes that stormwater will be managed by a single bioretention facility on the podium level, which will be directed to a Contech Mechanical Stormfilter Unit at the ground level. Treated runoff will then be directed to an onsite underground storm drain pipe which will convey runoff to an existing 18" storm drain within Fifth Avenue.[26] Additionally, as standard conditions of approval, the project will be required to submit an erosion and sediment control plan, stormwater control plan, and stormwater facilities operations and maintenance plan that complies with City of San Rafael and Marin County Stormwater Pollution Prevention Program to regulations. As proposed and conditioned, the project will not violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality.

Criterion B: would the project substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?

The site is currently fully developed and contains limited pervious areas that could contribute to groundwater recharge. As proposed, the project will decrease impervious areas, and as such conditions on the site related to groundwater recharge will be substantially the same. Additionally, as detailed in Marin Municipal Water Districts 2020 Urban Water management Plan, the District does not

[26] Stormwater Control Plan, KSR Civil Engineering, October 30, 2024, Page 1.

pump groundwater and does not plan to use groundwater as a supply source in the future.[27] As such, the project will not substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin.

Criterion C: would the project substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would (i) result in a 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?

As detailed in the Stormwater Control Plan prepared by KSR Civil Engineering on October 30, 2024 (Attachment 4), the project will decrease impervious area on the site from 26,510 square feet to 25,261 square feet, resulting in an approximately 5% decrease in impervious area.[28] The project will result in an overall similar impervious area when compared to existing conditions, will implement an erosion and sediment control plan subject to review and approval by the city, and will comply with the Marin County Stormwater Pollution Prevention Program to prevent the pollution of local waterways by managing stormwater runoff and protecting water quality. As proposed and consistent with standard conditions related to stormwater management and erosion control , the project will not result in significant effects associated with altering the existing drainage pattern of the site or area through the addition of impervious surfaces such that it would result in substantial erosion or siltation on- or off-site; substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite; create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or impede or redirect flood flows .

Criterion D: If within a flood hazard, tsunami, or seiche zone, would the project risk release of pollutants due to project inundation?

The project site is not within a flood hazard, tsunami, or seiche zones and will therefore not result in significant effects to water quality as a result of releasing pollutants due to project inundation.

Criterion E: would the project conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?

As stated above, the project is conditioned to comply with local regulations regarding erosion and sediment control and regional regulations related to preventing pollution of local waterways by managing stormwater runoff protecting water quality. Additionally, the San Rafael Valley Groundwater Basin is a very low priority basin and there are no current plans or requirements to prepare a

[27] Marin Municipal Water District, Updated 2020 Urban Water Management Plan, January 2024, Page 54.
[28] Stormwater Control Plan, KSR Civil Engineering, October 30, 2024, Table 1, Page 1.

sustainable groundwater management plan. Therefore, the project will not conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan.

Conclusion

In conclusion, the project will not result in significant effects related to traffic, noise, air quality, or water quality and as such, the project complies with criteria 15332(d) and qualifies for use of the Class 32 categorical exemption.

E) The site can be adequately served by all required utilities and public services

The project is within the scope of development anticipated by the San Rafael 2040 General Plan and Downtown Precise Plan and can be served by all available local and regional services including schools, public safety facilities including police and fire, and public health facilities. Additionally, the site can be adequately served by all required utilities and will connect to existing storm drain, sanitary sewer, and water utilities within the Fifth Avenue and C Street rights-of-way and has received will-serve letters from Marin Municipal Water District and San Rafael Sanitation District. Therefore, the project complies with criteria 15332(e) and qualifies for use of the Class 32 categorical exemption.

EXCEPTIONS TO EXEMPTIONS

If a project qualifies for use of a categorical exemption, then the lead agency must determine whether the project is subject to any of the exceptions to the use of a categorical exemption, pursuant to CEQA Guidelines Section 15300.2. A project will not qualify for use of a categorical exemption if any of the following circumstances exist:

A) Location. Certain classes of projects (Classes 3, 4, 5, 6, and 11) are qualified by consideration of where the project is to be located and whether it may impact an environmental resource of hazardous or critical concern.

Section 15300.2(a) does not apply to the Class 32 categorical exemption, therefore, this exception is not applicable to the project.

B) Cumulative Impact. All exemptions are inapplicable when the cumulative impact of successive projects of the same type in the same place, over time is significant.

The project is located on a site planned for high-density residential development. Other foreseeable projects in the vicinity include those listed on the City of San Rafael Major Planning Projects webpage[29] which are similar in nature to the proposed project, are anticipated as part of the 2040 General Plan, and would be subject to separate environmental review and evaluation. As proposed and conditioned, the project will incorporate best management practices to control air quality emissions and noise during construction.

[29] City of San Rafael, Community & Economic Development, Planning Division, Major Planning Project, https://www.cityofsanrafael.org/major-planning-projects-2025/, accessed October 2025.

At operation, the project will be all electric, will be located within ½ mile of a major transit stop, and will comply with Cal Green Tier 2 electric vehicle parking requirements. As proposed and conditioned, the project complies with the Bay Area Air District's screening criteria for greenhouse gas emissions. Furthermore, as described above, the project is consistent with the primary goals of the 2017 Bay Area Clean Air Plan, which are to protect public health and the climate by reducing GHG emissions. As such, the project will not result in cumulative impacts during constriction or operation, and the project is not excluded from the use of the Class 32 categorical exemption as a result of Section 15300.2(b).

C) Significant Effect. A categorical exemption shall not be used for an activity where there is a reasonable possibility that the activity will have a significant effect on the environment due to unusual circumstances.

The site is urbanized and developed with a commercial building and associated parking and landscaping. The site is designated and zoned for high-density residential use and the project is consistent with development envisioned by the General Plan. There are no wetlands, riparian habitats, creeks, environmentally sensitive areas, or other features that would constitute an unusual circumstance on the project site. Furthermore, the proposed density of the site is not unusual as it is generally consistent with the city's adopted Housing Element, which identifies a site-specific theoretical development capacity of 167 units.[30] While the project proposes 187 units, the use of smaller units and waivers available through State Density Bonus Law provides opportunities to increase the capacity of the site to provide high density housing in the downtown area. As such, the project is not excluded from the use of the Class 32 categorical exemption as a result of Section 15300.2(c).

D) Scenic Highways. A categorical exemption shall not be used for a project which may result in damage to scenic resources within a highway officially designated as a state scenic highway.

The proposed project is not located on, near, or within visible range of a state scenic highway nor a highway eligible for scenic designation.[31] Therefore, the project is not excluded from the use of the Class 32 categorical exemption as a result of Section 15300.2(d).

E) Hazardous Waste Sites. A categorical exemption shall not be used for a project located on a site which is included on any list compiled pursuant to Section 65962.5 of the Government Code.

A review of the California Department of Toxic Substances Control (DTSC) EnviroStor database, which contains a listing of all cleanup sites and hazardous waste facilities demonstrates that the site is not listed as a hazardous waste site.[32] An additional search of the California Waterboard Geotracker site

[30] San Rafael Housing Element 2023-2031, Appendix B: Housing Sites Inventory, Spreadsheet "F" Downtown Mixed Use Sites.

[31] California Department of Transportation, California State Scenic Highway System Map. https://caltrans.maps.arcgis.com/apps/webappviewer/index.html?id=465dfd3d807c46cc8e8057116f1aacaa accessed October 14, 2025.

[32] California Department of Toxic Substance Control. Online Envirostor Database Map. https://www.envirostor.dtsc.ca.gov/public/map/?global_id=21750004 accessed October 14, 2025.

which maps Leaking Underground Storage Tank (LUST) sites and Cleanup Program sites also did not show any open or closed listings for the site.[33] Based on the search records, there are no documented hazardous waste sites, and the project is not excluded from the use of the Class 32 categorical exemption as a result of Section 15300.2(e).

F) Historical Resources. A categorical exemption shall not be used for a project which may cause a substantial adverse change in the significance of a historical resource.

A record search of the California Historical Resource Information System revealed there are no historical resources listed within the project area[34]. The existing structure onsite was built in 2001 and includes no unique architectural features, nor does it hold any community significance. Notification of the project was sent to the Federated Indians of Graton Rancheria (FIGR) consistent with City Council Ordinance 1772 related to the preservation of archaeological resources. FIGR did not request consultation on the project. Additionally, the project will be subject to standard conditions of approval related to the inadvertent discovery of archaeological resources. As such, the project will not cause a substantial adverse change in the significance of a historical resource, and the project is not excluded from the use of the Class 32 categorical exemption as a result of Section 15300.2(f).

CONCLUSION

As provided above, the proposed project qualifies for exemption from further review pursuant to CEQA Guidelines Section 15332, and none of the exceptions to the use of a categorical exemption pursuant to CEQA Guidelines Section 15300.2 apply. As such, no further environmental review is required for the project.

Krystle Rizzi

KRYSTLE RIZZI
Principal Planner
krizzi@m-group.us
707.570.0723 x 208

EXHIBITS

1. Traffic Impact Study, Kimly-Horn and Associates, September 12, 2025
2. Noise and Vibration Assessment, Illingworth & Rodkin Inc, October 29, 2024, revised November 7, 2025
3. Air Quality Assessment, Illingworth & Rodkin Inc, July 9, 2025, revised October 31, 2025
4. Stormwater Control Plan, KSR Civil Engineering, October 30, 2024

REFERENCES

[33] California Water Board. Geotracker website. https://geotracker.waterboards.ca.gov/map/?CMD=runreport&myaddress=Sacramento accessed October 14, 2025.

[34] Northwest Information Center, File No: 24-0944. January 23, 2025.

5. California Department of Transportation, California State Scenic Highway System Map, https://caltrans.maps.arcgis.com/apps/webappviewer/index.html?id=465dfd3d807c46cc8e8057116f1aacaa, accessed October 14, 2025.
6. California Department of Toxic Substance Control. Online Envirostor Database Map, https://www.envirostor.dtsc.ca.gov/public/map/?global_id=21750004, accessed October 14, 2025.
7. California Water Board, Geotracker website, https://geotracker.waterboards.ca.gov/map/?CMD=runreport&myaddress=Sacramento, accessed October 14, 2025.
8. Marin Municipal Water District, Updated 2020 Urban Water Management Plan, January 2024.
9. Northwest Information Center, File No: 24-0944, submitted January 23, 2025.
10. Project Plans, Trachtenberg Designs, submitted June 3, 2025

Kimley»Horn

MEMORANDUM

To: Mr. Collin Monahan
1230 Fifth Avenue Investors, LLC
1101 Fifth Avenue, Suite 300
San Rafael, CA 94901

From: Elizabeth Chau, P.E.
Kimley-Horn and Associates, Inc.

Date: October 23, 2025

Subject: San Rafael – 1230 5th Avenue - Draft Transportation Impact Study Memorandum

Project Background

The project proposes to redevelop the existing building into 13-story multifamily housing consisting of 169 market rate units and 19 affordable housing units, totaling 188 dwelling units at 1230 5th Avenue in San Rafael, CA. Site plan is included as **Attachment A**. Monahan Pacific Corporation (Client) is requesting that Kimley-Horn prepare a Transportation Impact Study (TIS) for this project. The purpose of this memorandum is to document the process, assumptions, and results of the TIS.

Existing Conditions

The study area is shown in **Figure 1**.Project study intersections/driveways were selected in coordination with City and considered study intersections analyzed in TIS prepared for nearby projects. Based on coordination with City, the following five (5) study intersections/driveways were analyzed for this project:

1. Mission Avenue/C Street (existing)
2. Fifth Avenue/C Street (existing)
3. Fifth Avenue/South Project Driveway (existing)
4. Mission Avenue/NE Project Driveway
5. West Project Driveway/C Street

Note Intersection 3 currently serves as a shared driveway with the Mission Avenue apartments and will continue to serve as such. There is also an existing no-left turn sign which will also remain.

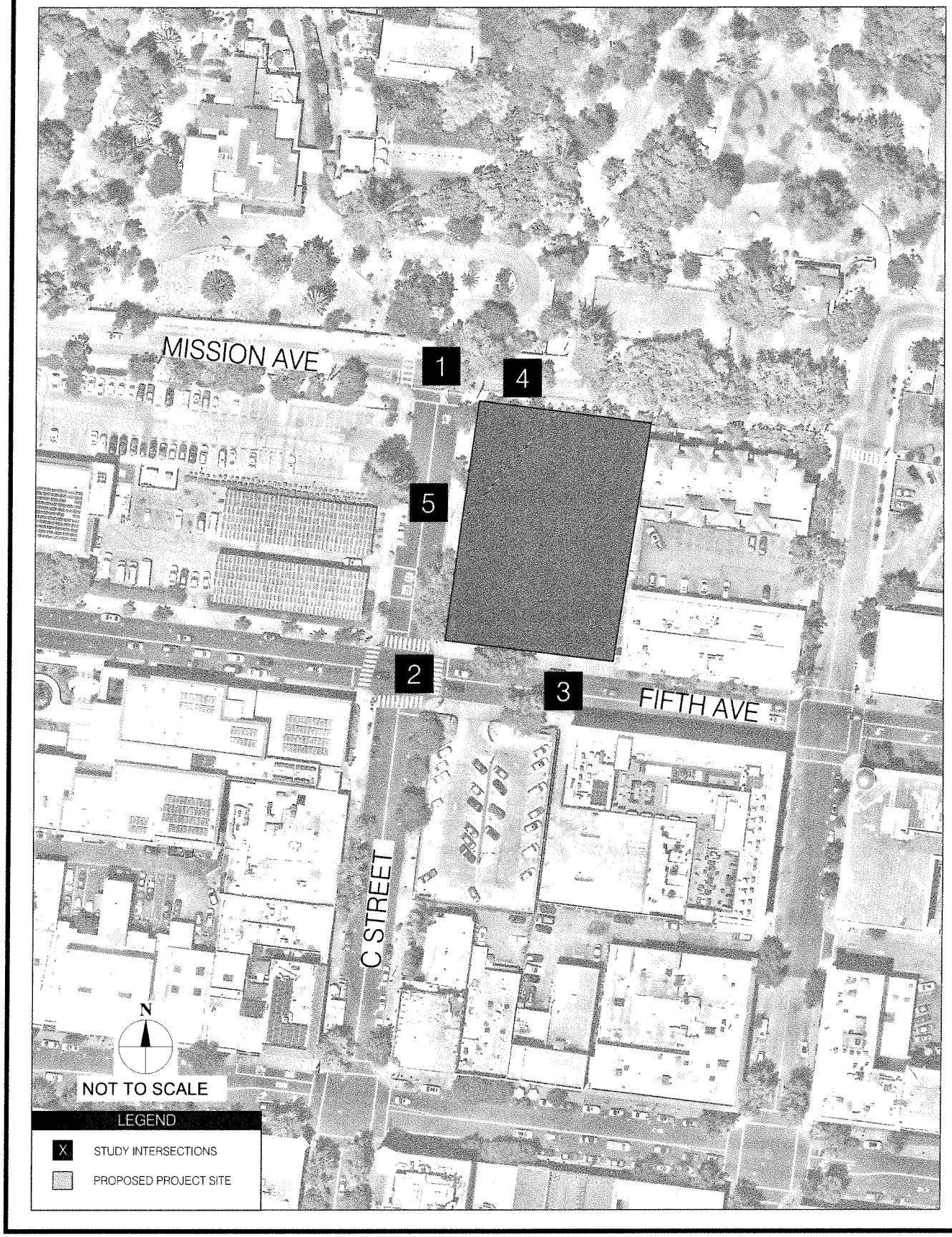


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FIGURE 1

STUDY AREA AND INTERSECTIONS

Roadways

The project borders C Street, Fifth Avenue, and Mission Avenue. C Street is a two-lane, north-south, local street that begins at Mission Avenue and continues south. In the study area, there are on-street parking spaces and the roadway mainly serves retail uses. There is no posted speed limit, but a prima facie speed limit of 25 miles per hour was assumed based on the roadway type. Fifth Avenue is a two-lane, east-west, minor arterial that begins at Grand Avenue and continues west. In the study area, there are on-street parking spaces, and the roadway mainly serves retail and residential uses. The posted speed limit is 25 miles per hour. Mission Avenue is a two-lane, east-west, local street that beings at H Street and continues to the east. In the study area, the roadway mainly serves residential uses and provides direct access to US-101. The posted speed limit is 25 miles per hour.

Bicycle Facilities

Bicycle facilities are shown in **Figure 2**.There are few bicycle facilities in the immediate area of the project. There are no bicycle facilities adjacent to the project, but there are Class III bike sharrows on Fourth Street approximately 350 feet south of the project and on C Street and D Street below Fourth Street. There are no bicycle facilities that provide direct access to the site.

Transit Facilities

Marin Transit, Golden Gate Transit, and the Sonoma-Marin Area Rail Transit (SMART) operate within San Rafael. Marin Transit Bus Routes 22, 23, and 68 and Golden Gate Transit Bus Route 132 run along Fourth Street. The closest bus stop to the project is 350 feet south, at the intersection of C Street and Fourth Street. These bus routes provide direct connection to the SMART San Rafael station, which provides rail service from Sonoma County Airport to Larkspur. Transit facilities are shown in **Figure 3**.

Pedestrian Facilities

There are existing continuous sidewalks on both sides of the street near the study area on Mission Avenue, C Street, and Fifth Avenue. There are also existing signalized crosswalks on all approaches of the intersection of C Street and Fifth Avenue and existing stop-controlled crossings in the south and east directions at the intersection of Mission Avenue and C Street. There are sufficient pedestrian facilities adjacent to the project to nearby complimentary uses.

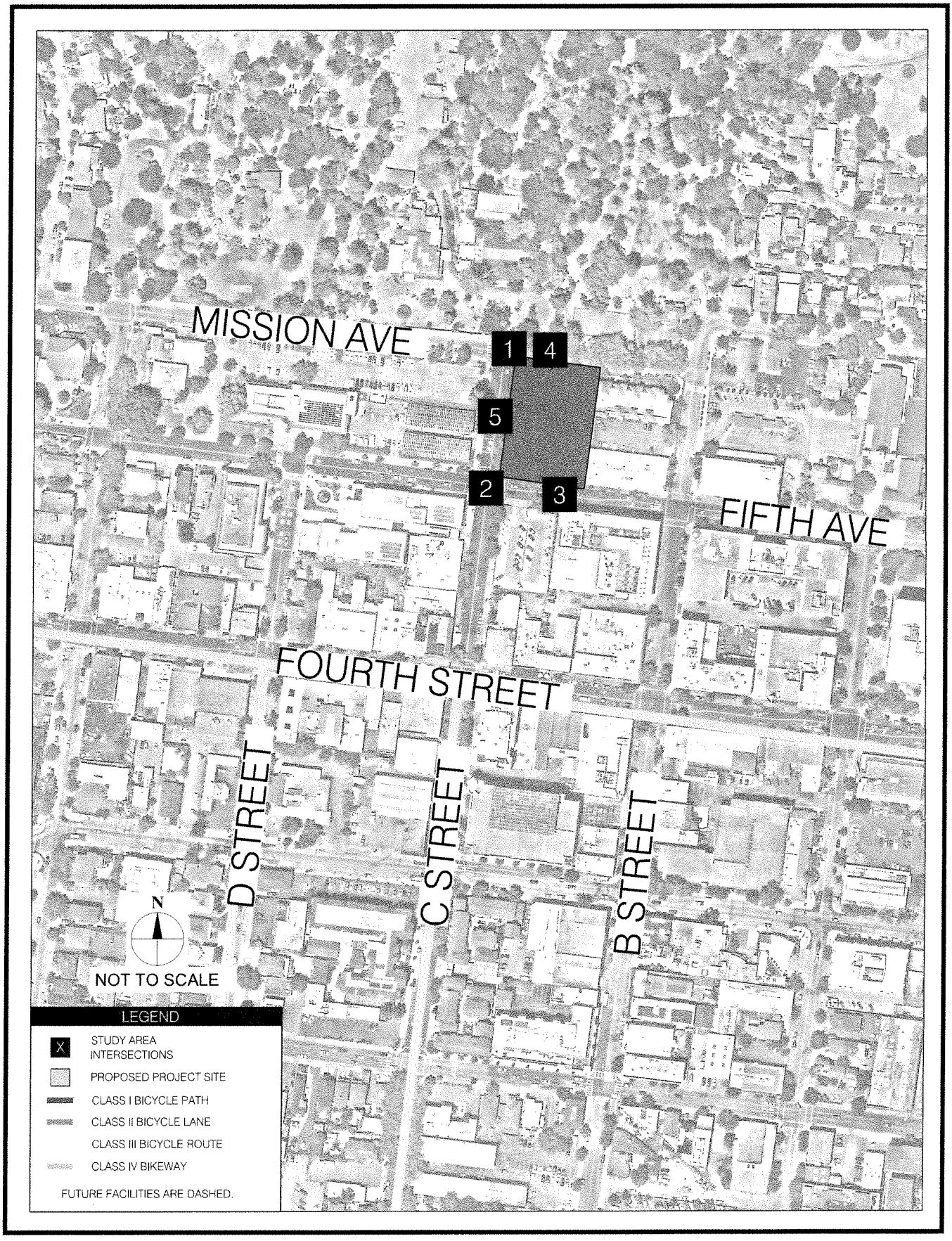

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FIGURE 2
BICYCLE FACILITIES

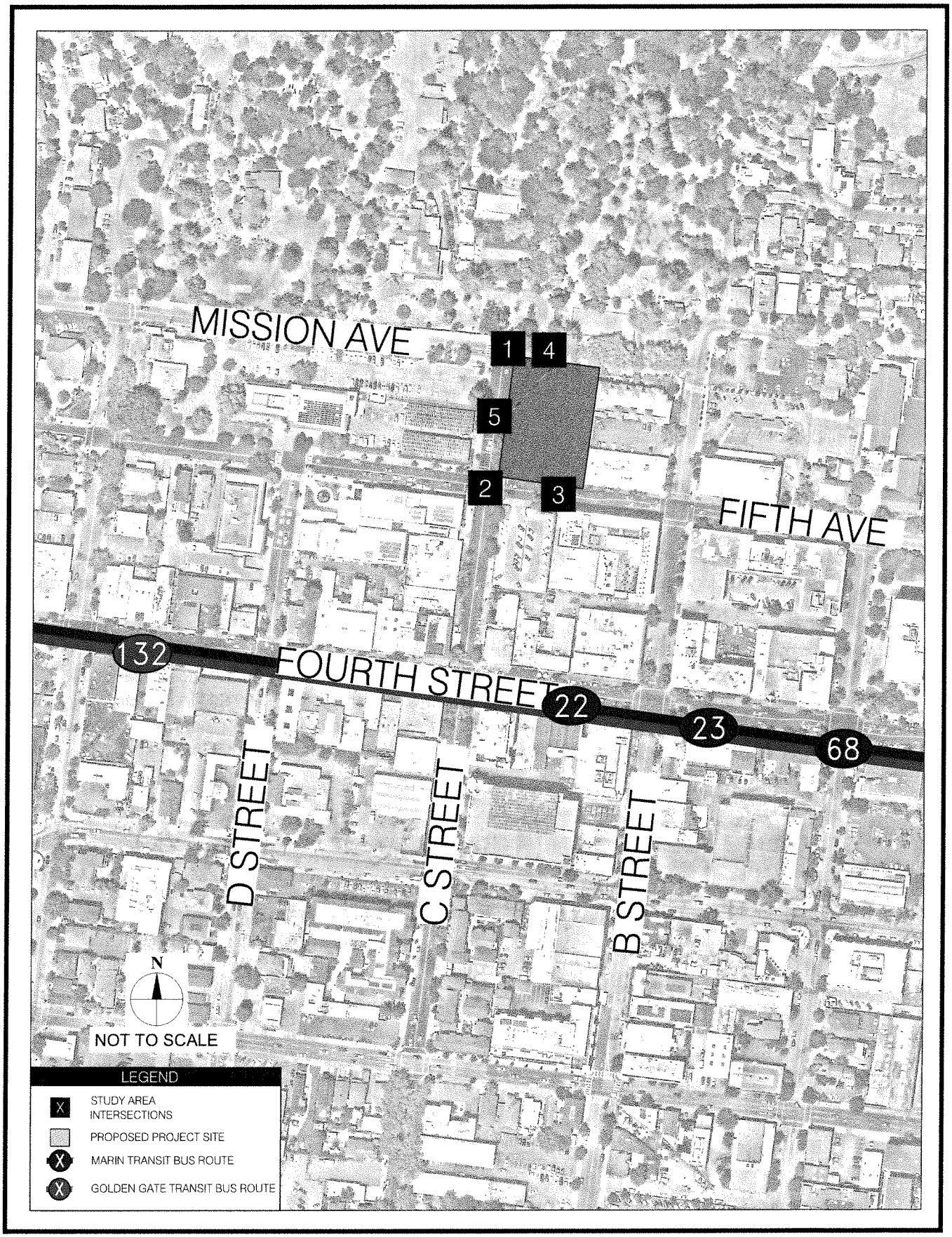

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FIGURE 3
TRANSIT FACILITIES

EXISTING LOS

Existing condition represent existing condition at the time the project applicant begin the planning process back in 2023. The intersection level of service (LOS) and queuing were reviewed at each of the four (4) study intersections using Highway Capacity Manual (HCM) methodology within Synchro software. Similar to other approved traffic studies, the City considers LOS A through LOS D to be acceptable levels of service. LOS E and LOS F are considered unacceptable levels of service.

Existing Volumes

Intersection turning movement volumes for the study intersections were collected on Thursday, September 7, 2023 for all intersections. All counts were collected when local schools were in session. In addition the existing building was occupied at the time traffic counts were collected. Volumes were collected between 7:00 AM – 9:00 AM to capture the AM peak periods, and between 4:00 PM – 6:00 PM for the PM peak periods. Existing baseline volumes are shown in **Figure 4**. Raw counts included in **Attachment B**.

Existing Lane Geometry and Signal Timing

The intersection lane geometries were determined based on aerial imaging from Nearmap and signal timing parameters are based on timing sheets provided by the City of San Rafael.

Traffic operations were evaluated at the study intersections under existing traffic conditions. Results of the analysis are presented in **Table 1**. All study intersections function within acceptable LOS standards under this analysis scenario. Note for side street stop control (SSSC) intersection (Intersection 3-5), HCM methodology defines LOS as a function of the average control delay for he worst minor street movement/approach or major street left-turn. Analysis outputs are shown in **Attachment E**.

Table 1 – Existing Peak Hour LOS Summary

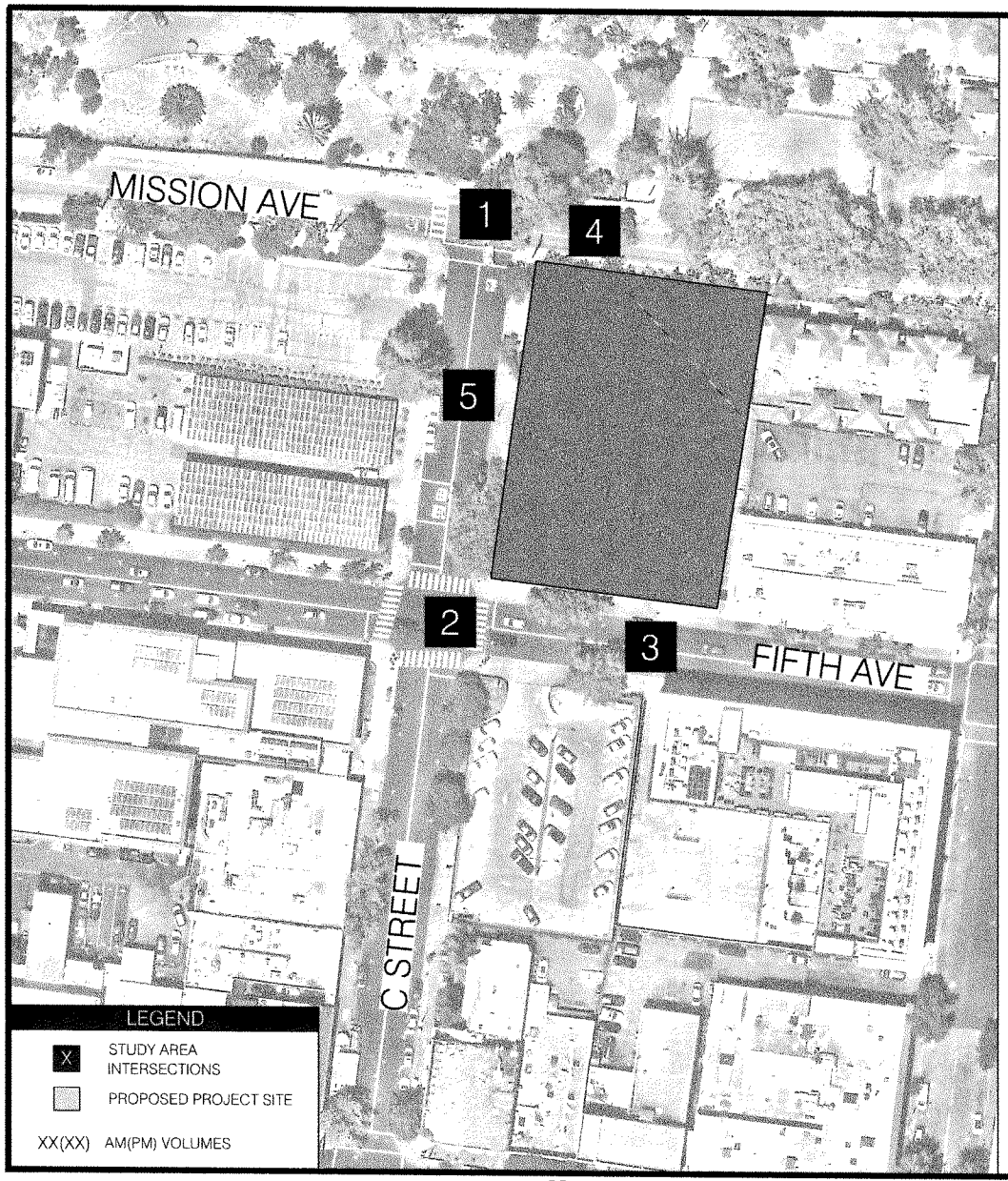
#	Study Intersection/ Project Driveway	LOS Criteria	Jurisdiction	Control[1]	Existing (2023)			
					AM Peak		PM Peak	
					LOS	Delay (sec)	LOS	Delay (sec)
1	Mission Avenue/C Street	D	City	AWSC	B	13.8	B	13.1
2	Fifth Avenue/C Street	D	City	Signal	A	7.8	B	10.6
3	Fifth Avenue/South Project Driveway	D	City	SSSC	A	0.1	A	0.2
	Worst Approach				B	11.1	C	17.1
4	Mission Avenue/NW Project Driveway	D	City	SSSC	Future Project Driveway			
	Worst Approach							
5	C Street/West Project Driveway	D	City	SSSC	Future Project Driveway			
	Worst Approach							

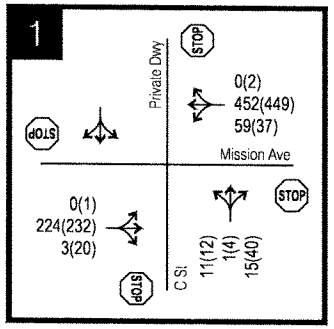
Note:

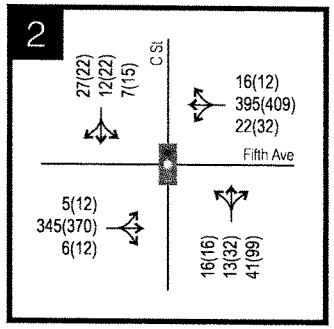
AWSC = All-way Stop Control, SSSC = Side Street Stop Control

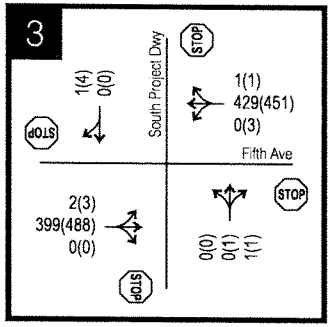
The average intersection control delay is reported for signalized and AWSC intersections. SSSC reports delays for the average intersection and worst movement/approach.

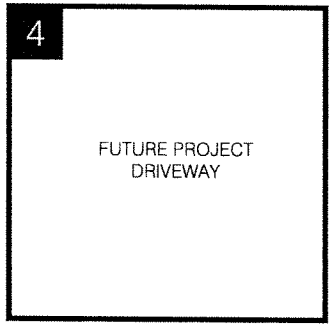
Study driveways #4, and #5 are future driveways with the project and therefore were not analyzed in Existing conditions.

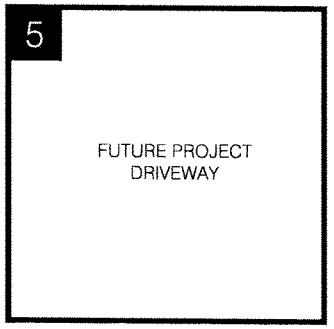












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N

NOT TO SCALE

FIGURE 4

EXISTING TURNING MOVEMENT VOLUMES

TRIP GENERATION

Trip generation for developments is typically calculated based on data from the Institute of Transportation Engineer's (ITE) *Trip Generation, 11th Edition*[1]. This is the standard reference for determining trip generation for potential projects. Trip generation estimates for the proposed project were calculated based on data within this reference. For some land uses, an average rate and a fitted curve equation are provided for the sample data. ITE methodology dictates that the fitted curve equation should be used if there are 20 or more data points, or if the R^2 value is greater than 0.75 (the R^2 value shows how close the data is to the fitted curve, with 1.0 being the best fit, and 0.0 showing no fit) and the weighted standard deviation if the weighted average rate is greater than or equal to 55 percent of the weighted average rate. Trip Generation data are included as **Attachment C**.

For the proposed market rate units, the average rate for ITE Land Use 222 (Multifamily Housing High-Rise – Close to Rail Transit) was used to determine the daily, AM peak hour, and PM peak hour trips. The project is located within 0.5 miles of the Sonoma-Marin Area Rail Transit and is therefore considered close to rail transit. For the affordable housing units, the average rate for ITE Land Use 223 (Affordable Housing) was used to determine the daily, AM peak hour, and PM peak hour trips. The total proposed project trip generation is shown in **Table 2** and will generate 760 daily trips, 46 AM peak hour trips, and 53 PM peak hour trips.

Since the existing land uses are proposed to be removed from the site, an existing trip credit was taken. Trips associated with the existing office building (Ascendant Studios) will be removed as this building will be demolished. Existing trip generation for the office building was based on the ITE *Trip Generation Manual, 11th Edition*. The average rate for ITE Land Use 712 (Small Office Building) was used to determine the daily, AM peak hour, and PM peak hour trips. Existing trip credits are shown in **Table 2** and results in 136 daily trips, 16 AM peak hour trips, and 20 PM peak hour trips.

As shown in **Table 2**, the proposed project will generate a net new 624 daily trips, 30 AM peak hour trips, and 33 PM peak hour trips throughout the street network. This excludes the redistribution of existing Mission Avenue apartment trips. Currently, the southern Mission Avenue apartment garage entrance is accessible from both C Street and Fifth Street. With the Project, this entrance will only be accessible from the Fifth Street driveway, so existing C Street driveway trips were reassigned to Fifth Street driveway. The number of redistributed trips were determined based on the difference between existing trip generation and collected driveway counts which are 110 daily, 8 AM and 0 PM peak hour trips. With these redistributed trips, the total trips at the project driveways will equate to 830 daily trips, 54 AM peak hour trips, and 53 PM peak hour trips.

[1] *Trip Generation Manual, 11th Edition*, Institute of Transportation Engineers, Washington D.C., 2021.

Table 2 – Trip Generation

Land Use	ITE Land Use Code	Units	Daily Trips Rate	AM Peak Hour			PM Peak Hour		
				In%	Out%	Rate	In%	Out%	Rate
Small Office Building	712	KSF	14.39	82	18	1.67	34	66	2.16
Multifamily Housing (High-Rise) - Close to Rail Transit	222	DU	3.96	33	67	0.23	57	43	0.26
Affordable Housing – Income Limits	223	DU	4.81	29	71	0.36	59	41	0.46
Land Use	**ITE Land Use Code**	**Size (Units)**	**Daily Trips**	**AM Peak Hour**			**PM Peak Hour**		
				In	**Out**	**Total**	**In**	**Out**	**Total**
Existing Use to be Removed (Ascendent Studios)									
Small Office Building [A]	712	9.445 KSF	136	13	3	16	7	13	20
Proposed Use									
Multifamily Housing (High-Rise) - Close to Rail Transit [B]	222	169 DU	669	13	26	39	25	19	44
Affordable Housing – Income Limits [C]	223	19 DU	91	2	5	7	5	4	9
Total Proposed [D] = [B] + [C]			*760*	*15*	*31*	*46*	*30*	*23*	*53*
Net New Trip Generation [E] = [D] – [A]			**624**	**2**	**28**	**30**	**23**	**10**	**33**

DU - Dwelling Units

1. Existing and proposed trip generation developed based on the ITE *Trip Generation Manual, 11th Edition.*
2. ITE Trip Generation averages rates used for ITE Land Use Codes 712, 222, and 223.

Trip Distribution and Assignment

The Project's trip distribution was estimated based on the project access locations, freeway access, and roadway network within the study area. The trips were distributed as follows:

- East Mission Avenue: 40%
- West Mission Avenue: 10%
- East Fifth Avenue: 30%
- West Fifth Avenue: 10%
- South C Street: 10%

Trip distribution is shown in **Figure 5.** Based on the assumed trip distribution, the volumes generated by the project were assigned to the roadway network. Total proposed trips (row D from **Table 2**) were assigned to the project driveways based on the number of spaces spacing accessible by each garage entrance. **Figure 6** presents the project's AM and PM peak hour trip assignment. Note that, as discussed in **Trip Generation** section, the total inbound and outbound project trips do not match values in **Table 2.** Instead, it represents the sum of net new Project trips (row E from **Table 2**) and redistribution of Mission Avenue apartment garage trips. Trip assignment figures for the existing removal, existing redistributed, and proposed project are included in **Attachment D**.

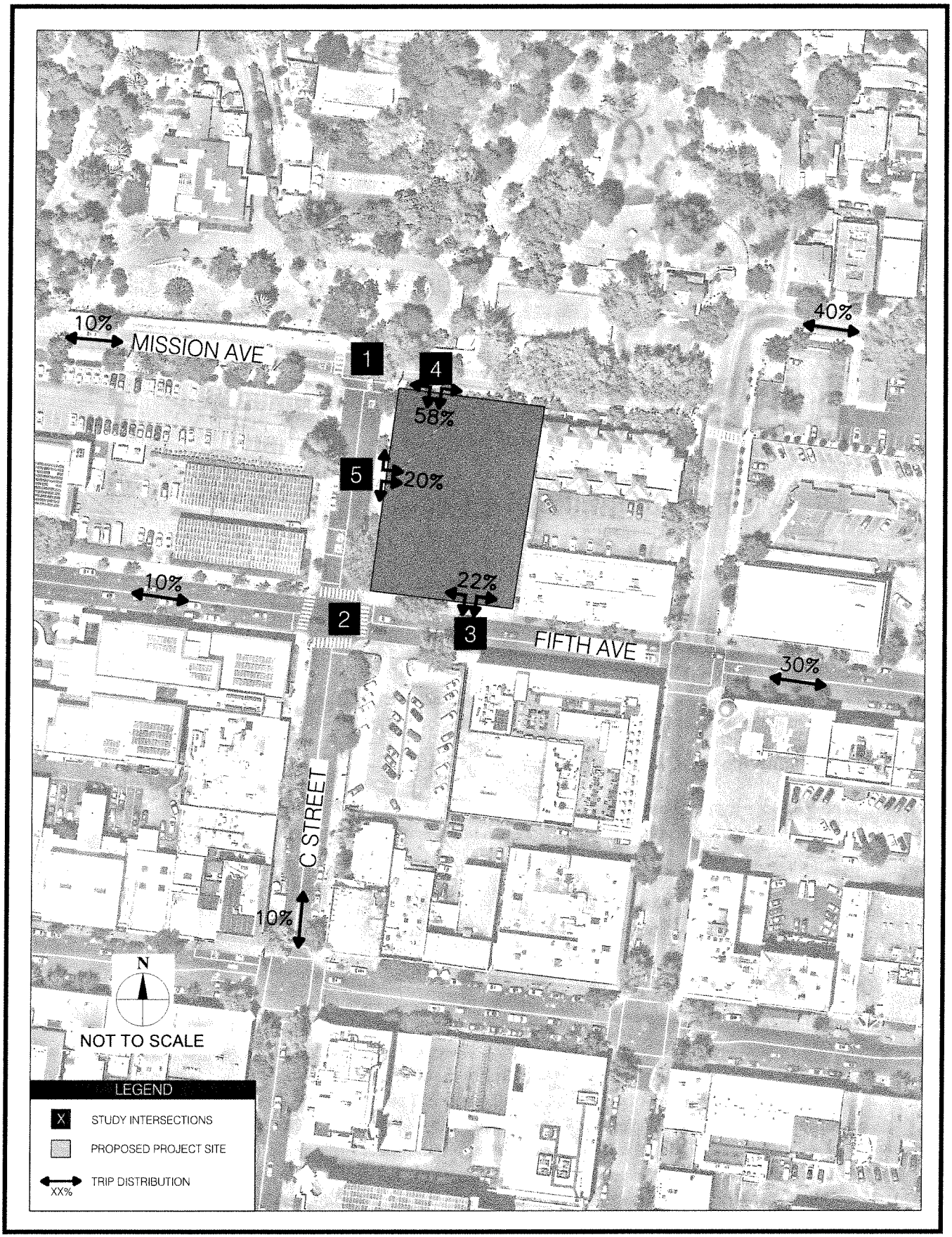

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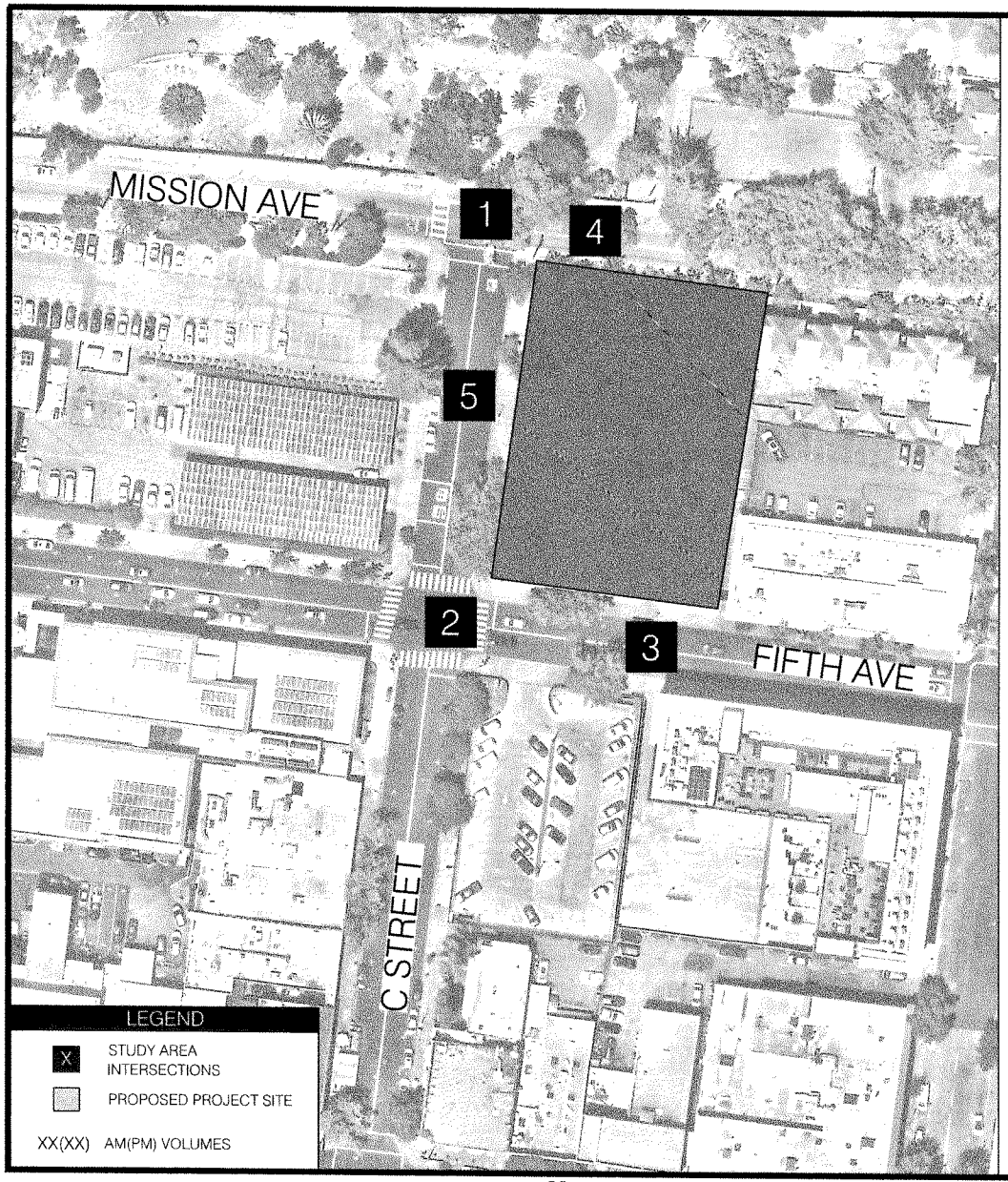
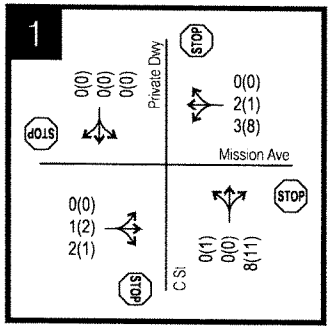
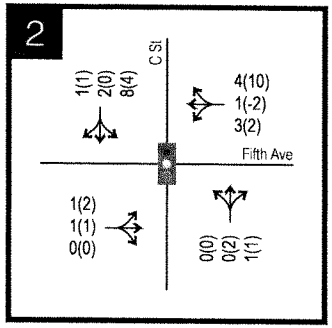
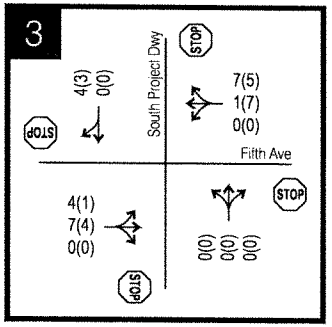
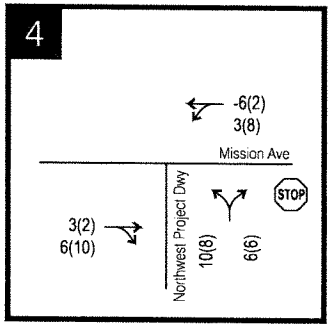
FIGURE 5
PROJECT TRIP DISTRIBUTION

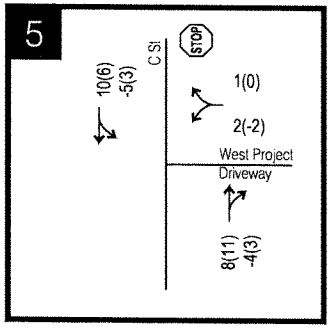












NOTE: VOLUMES REFLECT NET NEW GENERATED TRIPS AFTER REMOVAL OF EXISTING OFFICE AND REDISTRIBUTION OF EXISTING MISSION AVENUE APARTMENT SOUTH GARAGE TRIPS.

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FIGURE 6
PROJECT TURNING MOVEMENT VOLUMES

VEHICLE MILES TRAVELLED (VMT)

As shown in **Figure 7** the Project is 0.5 mile walking distance from the Downtown San Rafael SMART Station. Based on the City of San Rafael Transportation Analysis Guidelines, projects located with 0.5 mile walkshed, or walking distance, of a major transit stop are presumed to not require CEQA VMT analysis. To be screened out from VMT analysis, the project will also need to meet the following requirements:

- The project has a Floor Area Ratio (FAR) of more than 0.75;
- The proposed parking does not exceed the minimum required by the Zoning Code or applicable plan;
- The Project is consistent with the City's General Plan, applicable Specific Plan, or applicable Sustainable Communities Strategy (as determined by the lead agency, with input from the Association of Bay Area Governments (ABAG) and the Metropolitan Transportation Commission (MTC));
- The Project does not remove or reduce the number of existing on-site affordable residential units; and
- Less-than-significant levels of VMT are projected through project-specific or location-specific information.

Table 3 summaries the criteria for VMT screening.

Source: Google Maps, accessed October 9, 2025

Figure 7 – Project Walking Distance

Table 3 – VMT Screening Criteria

Criteria	Project
Floor Area Ratio (FAR) of more than 0.75	Project FAR is more than 0.75. **Criteria met.**
Parking does not exceed minimum required	Project parking does not exceed the required 156 minimum parking spaces per Downtown San Rafael Precise Plan (DSRPP). **Criteria met.**
Consistent with adopted plans	Project does not contradict any adopted plans. **Criteria met.**
No reduction of affordable residential units	Project does not reduce adorable residential units. **Criteria met.**
Less-than-signification levels of VMT projected	Less-than-significant levels of VMT projected. **Criteria met.**

EXISTING PLUS PROJECT INTERSECTION LOS RESULTS

Project volumes were added to the existing baseline volumes and are shown in **Figure 8. Table 4** shows the existing plus project LOS summary for each study intersection in the AM and PM peak hours. As shown, each intersection operates at an acceptable LOS. Analysis outputs are shown in **Attachment E**.

Table 4 – Existing plus Project Peak Hour LOS Summary

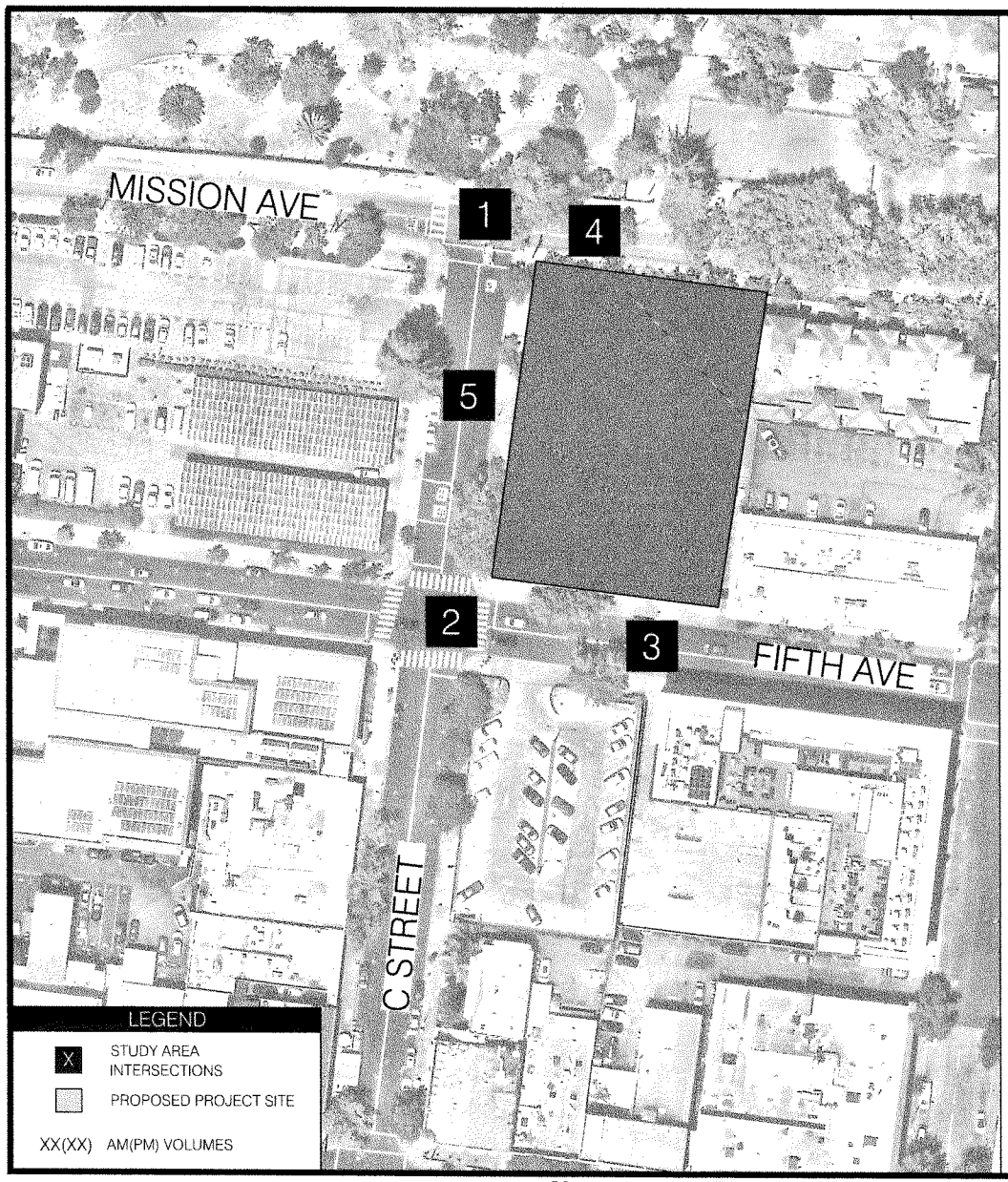
#	Study Intersection/ Project Driveway	LOS Criteria	Jurisdiction	Control[1]	Existing (2023)				Existing (2023) plus Project					
					AM Peak		PM Peak		AM Peak			PM Peak		
					LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	Var (sec)	LOS	Delay (sec)	Var (sec)
1	Mission Avenue/C Street	D	City	AWSC	B	13.8	B	13.1	B	14.1	0.3	B	13.6	0.5
2	Fifth Avenue/C Street	D	City	Signal	A	7.8	B	10.6	A	8.2	0.4	B	10.8	0.2
3	Fifth Avenue/South Project Driveway	D	City	SSSC	A	0.1	A	0.2	A	0.1	0.0	A	0.2	0.0
	Worst Approach				*B*	*11.1*	*C*	*17.1*	*B*	*11.1*	*0.0*	*C*	*17.4*	*0.3*
4	Mission Avenue/NW Project Driveway	D	City	SSSC	Future Project Driveway				A	0.3	-	A	0.3	-
	Worst Approach								*B*	*13.7*	-	*B*	*13.7*	-
5	C Street/West Project Driveway	D	City	SSSC	Future Project Driveway				A	0.7	-	A	0.4	-
	Worst Approach								*A*	*8.8*	-	*A*	*9.1*	-

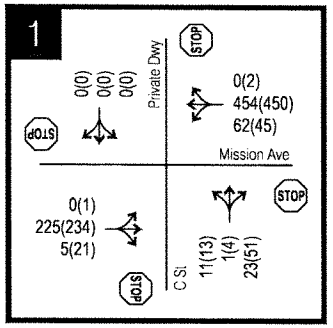
Note:

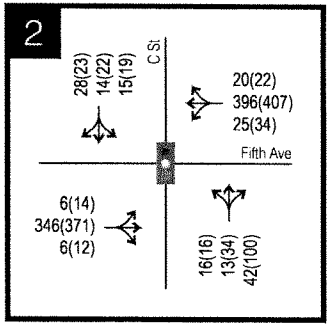
AWSC = All-way Stop Control, SSSC = Side Street Stop Control

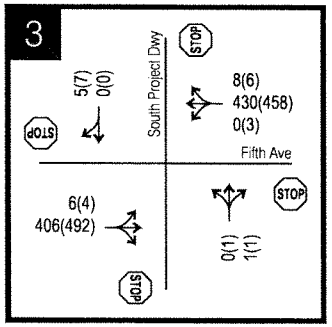
The average intersection control delay is reported for signalized and AWSC intersections. SSSC reports delays for the average intersection and worst movement/approach.

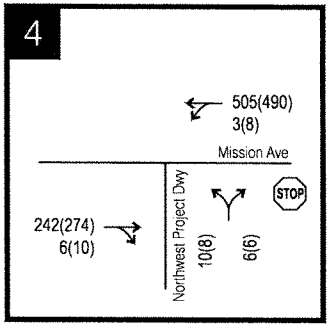
Study Driveways #4, and #5 are future driveways with the project and therefore were not analyzed in Existing conditions.











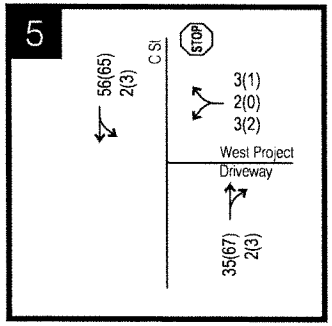


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FIGURE 8

EXISTING PLUS PROJECT TURNING MOVEMENT VOLUMES

INTERSECTION QUEUING

Intersection queuing was evaluated to determine if project traffic would potentially create hazardous conditions by blocking or disrupting through traffic. The effects of vehicle queuing were analyzed and the 95th percentile queue is reported for each approach. The 95th percentile queue length represents a condition where 95 percent of the time during the peak hour, traffic volumes will be less than or equal to the queue length determined by the analysis. The 95th percentile queue was determined based on outputs from *Synchro* queues report for signalized intersection and HCM 95th-tile Q for unsignalized intersections. **Table 5** presents results of the intersection queuing analysis. Queuing analysis found that all intersection queuing would not spill onto the adjacent intersections. **Attachment E** contains the queuing worksheets for the Project's driveways.

SITE ACCESS AND CIRCULATION

This section discusses site access, driveway location, safety, sight distance, site circulation, pedestrian facilities, bicycle facilities, transit recommendations, and parking analysis for the project.

Site Plan is included as **Attachment A**. The following summarizes the project access locations:

- Mission Avenue/NW Project Driveway
  - Stop-controlled northbound movement for project driveway
  - Full access
- Fifth Avenue/South Project Driveway
  - Stop-controlled southbound movement for project driveway
  - No left-turns out
- C Street/West Project Driveway
  - Stop-controlled northbound movement for project driveway
  - Full access

Queuing

As shown in **Table 5,** it is anticipated that minimal queuing (less than one vehicle or 25 feet) would occur at each project driveway, therefore each project driveway throat depths are sufficient to accommodate the project outbound queues during the peak hours. Therefore, there are no anticipated conflicts or excessive queuing. Note while the westbound queue at Mission Avenue and C Street (#1) may spill past the Mission Avenue driveway (#4), there are enough times where there is not a queue which allows vehicles to make a left in or out of the Mission Avenue driveway.

Table 5 – Intersection Queuing Summary

#	Intersection	Control	Approach	Storage Length[1] (feet)	Peak Period	Queue Length[2] (feet)	
						Without Project	With Project
1	Mission Avenue/C Street	All-way Stop Control	EB	360	AM	35	35
					PM	40	40
			WB	290	AM	138	143
					PM	123	130
			NB	190	AM	<25	<25
					PM	<25	<25
2	Fifth Avenue/C Street	Signal	EB	290	AM	68	68
					PM	99	102
			WB	120	AM	87	89
					PM	121	125
			NB	105	AM	55	54
					PM	83	84
			SB	190	AM	42	54
					PM	56	59
3	Fifth Avenue/South Project Driveway	Side Street Stop Control	SB	-	AM	<25	<25
					PM	<25	<25
4	Mission Avenue/NW Project Driveway	Side Street Stop Control	NB	-	AM	-	<25
					PM	-	<25
5	C Street/West Project Driveway	Side Street Stop Control	WB	-	AM	-	<25
					PM	-	<25

Note
[1]Distance to adjacent intersection
[2]HCM 95th-tile vehicle queue for unsignalized intersections was converted to feet based on 25 feet per vehicle.

Mission Avenue Driveway Sight Distance

A sight distance analysis was performed at Mission Avenue driveway to determine if vehicles exiting the driveway would have adequate sight distance to observed conflicting vehicles and pedestrian traffic along Mission Avenue. As shown in an excerpt of Civil Sheet C1.2 (**Figure 9**), vehicles exiting will be on relatively level surface where drivers' vision would be not impeded compared if the vehicles were at an steep include or decline.

For vehicle traffic, intersection sight distance for the project driveway was evaluated following methodology from the American Association of State Highway and Transportation Officials (AASHTO), *A Policy on Geometric Design of Highway and Street, 7th Edition*[2]. Sight distance for each project driveway was determined based on the proposed project site plan and the following AASHTO intersection sight distance criteria formula:

[2] *A Policy on Geometric Design of Highway and Street, 7th Edition,* American Association of State Highway and Transportation Officials (AASHTO), 2018.

$$\text{Intersection Sight Distance (ISD)} = 1.47 \times V_{major} \times t_g$$

Where V_{major} is the design speed of the major road and t_g is the time gap for the vehicle to exit the project driveway and enter the major road. Even though the speed limit on Mission Avenue is 25 mph, a V_{major} of 15 miles per hour (mph) was assumed due To the proximity of the all-way stop control at Mission Avenue and C Street.

The ISD for the Mission Avenue Driveway is summarized in **Table 6.** For sight distance for right turn is 145 and 280 for left-turn. As shown in **Figure 10**, there are clear sight triangles for a passenger car exiting the driveway to observe oncoming vehicles. It is recommended that the developer ensures these sight triangles are clear of obstacles.

Table 6 – Intersection Sight Distance

Movement	Right	Left
Design speed, V_{major} (mph)	15	25
Time gap, $t_{g\,(s)}$	6.5	7.5
Intersection Sight Distance (feet)	145	280

For additional pedestrian safety, the Project is proposing to install a curved mirror at the garage exit to increase visibility of approaching pedestrian and/or flashing light system at the driveway exit gate to increase visibility and awareness for both pedestrians and drivers.

Vehicular Access and Circulation

Passenger cars may use all three driveways to enter or exit the site. Due to the grading of the site, there is no internal connection between garage levels, therefore a specific garage level can only be accessible by its corresponding driveway. Surface parking spaces are accessible only through Fifth Avenue Driveway.

The project will have adequate emergency access, as the Fifth Avenue Driveway entrance height is approximately 20-feet tall, which can better accommodate emergency vehicles. It is recommended that emergency responses agencies be notified of project construction schedule and be accommodated during construction. Therefore, there will be no impact.

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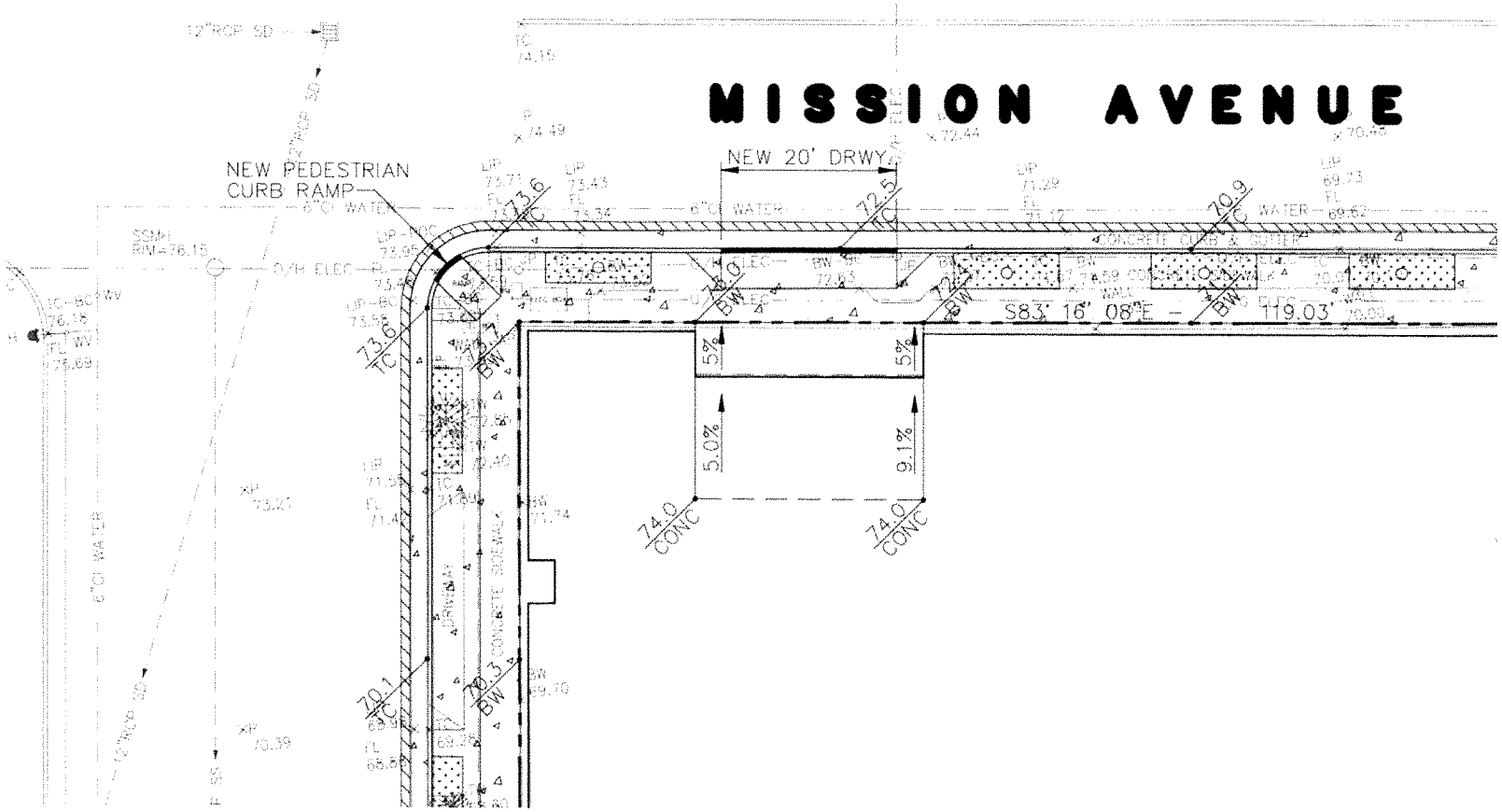

Figure 9: Except from Civil Sheet C1.2 (Mission Avenue Driveway)

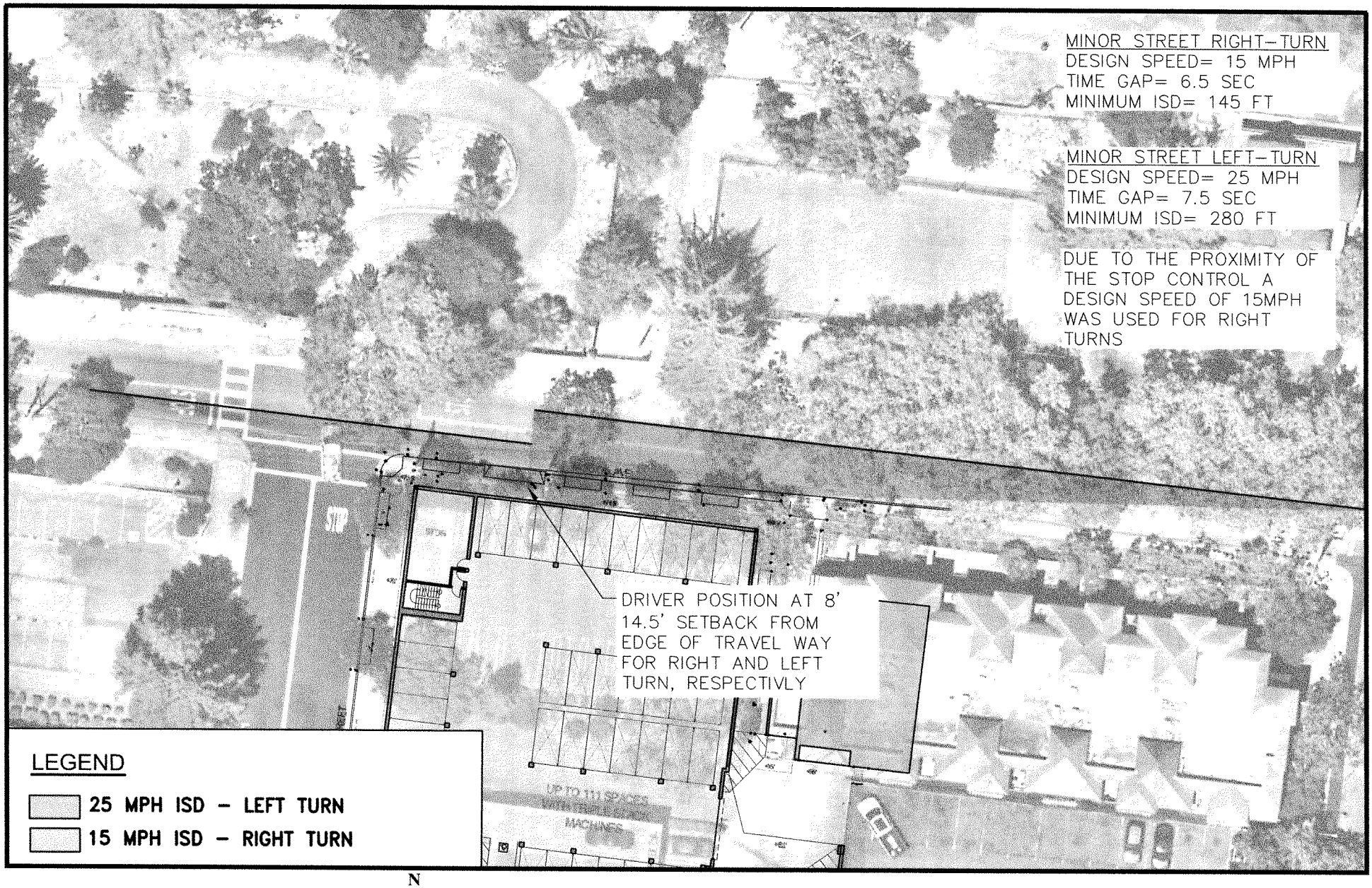

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FIGURE 10

MISSION AVENUE DRIVEWAY INTERSECTION SIGHT DISTANCE

Pedestrian Access and Circulation
Continuous sidewalks exist on both sides of C Street, Fifth Avenue, and Mission Avenue (except on the north side of Mission Avenue between B street and C Street). There are also existing signalized crossings in all directions at the intersection of C Street and Fifth Avenue, and existing stop-controlled crossings in the south and west legs at the intersection of Mission Avenue and C Street. Within the project site, there are marked pedestrian crosswalks connecting the accessible parking spaces to the west side building sidewalk. There are sidewalks along the west side of the building which provide access to the office spaces.

The Project does not conflict with any pedestrian-related program, plan, ordinances or policies, therefore, there will be no impacts.

Bicycle Access and Circulation
Bicycles will have access to the project site using the Class III bike routes along Fourth Street and C Street. There are no bicycle facilities that provide direct access to the site. Bicycle facilities along C Street from Fourth Street to Mission Avenue would provide access to commercial, residential, and retail uses to the south of the site, as well as access to transit stops.

The Project does not conflict with any bicycle-related program, plan, ordinances or policies, therefore, there will be no impacts

Transit Access and Circulation
Marin Transit, Golden Gate Transit, and the Sonoma-Marin Area Rail Transit (SMART) operate within San Rafael. Marin Transit Bus Routes 22, 23, and 68 and Golden Gate Transit Bus Route 132 run along Fourth Street. The closest bus stop to the project is 350 feet south, at the intersection of C Street and Fourth Street. These bus routes provide direct connection to the SMART San Rafael station, which provides rail service from Sonoma County Airport to Larkspur. Since the bus routes serves as a sufficient transit facility in proximity to the project along Davis Street to nearby complimentary uses, as well as the regional rail SMART, no additional transit facilities are recommended to be constructed by the project.

The Project does not conflict with any transit-related program, plan, ordinances or policies, therefore, there will be no impacts

Parking Requirements
The project is proposing to provide 126 parking spaces. If needed, the Project can install parking stackers which increase parking supply to 169 spaces. As shown in **Figure 7**, the project is located within a 0.5-mile of a major transit stop (Downtown San Rafel SMART station) and the project is providing a minimum of 11 percent very low income housing units, the project qualifies for the State Density Bonus that allows for a minimum parking requirement of 0.5 parking spaces per unit. Using this parking requirement results in 94 parking spaces being required. Therefore, the project provides more than enough parking to satisfy the parking requirements.

CONCLUSION

The project proposes to redevelop the existing building into 188 dwelling units of multifamily housing (169 market rate units and 19 affordable housing units) at 1230 5th Avenue in San Rafael, CA. This section summaries the results and recommendations of this traffic study.

Project Driveways

The development of the proposed Project will access the following driveways:

- Mission Avenue/NW Project Driveway
  - Stop-controlled northbound movement for project driveway
  - Full access
- Fifth Avenue/South Project Driveway
  - Stop-controlled southbound movement for project driveway
  - No left-turns out
- C Street/West Project Driveway
  - Stop-controlled northbound movement for project driveway
  - Full access

Project Impacts and Mitigations

As discussed previously, the project meets the criteria to be screened out from VMT analysis due to its proximity to the Downtown San Rafael SMART rail station. Therefore, the project will result in a less-than-significant transportation impact.

Traffic Operations

An intersection analysis was completed at five (5) intersections near the project site. Based on this analysis, each intersection currently operates at an acceptable level of service and will continue to operate at acceptable levels of service with the addition of the project.

Intersection Queuing

Intersection queuing analysis found that all intersection queuing would not spill onto the adjacent intersections. In addition, it is anticipated that minimal queuing would occur at each project driveway.

Mission Avenue Driveway Sight Distance

Sight distance analysis found there are no major obstacles within the sight triangles for the Mission Avenue driveway.

Site Access and Circulation

Site access and circulation evaluation found adequate site access and circulation for vehicle, pedestrians, and bicyclists. The parking evaluation found that the Project satisfies parking requirements. The Project was found to provide adequate access for emergency response and does not conflict with any pedestrian, bicycle, roadway, or transit-related program, plan, ordinances or policies, therefore, there will be no impacts.

Attachments

- Attachment A – Site Plan
- Attachment B – Turning Movement Counts
- Attachment C – Trip Generation
- Attachment D – Additional Trip Assignment Figures
- Attachment E – Synchro LOS Queuing Outputs

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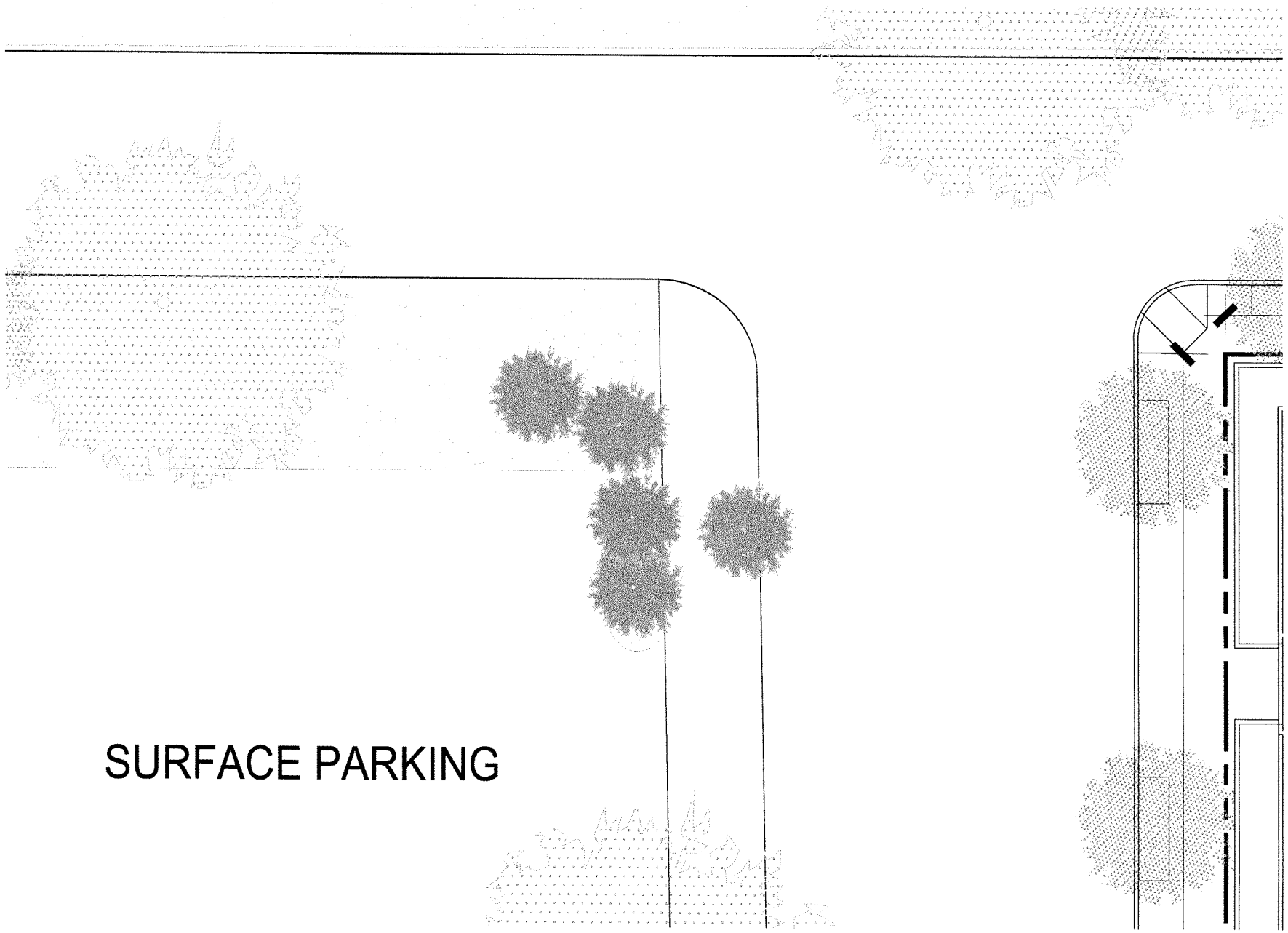
Attachment A – Site Plan



SURFACE PARKING

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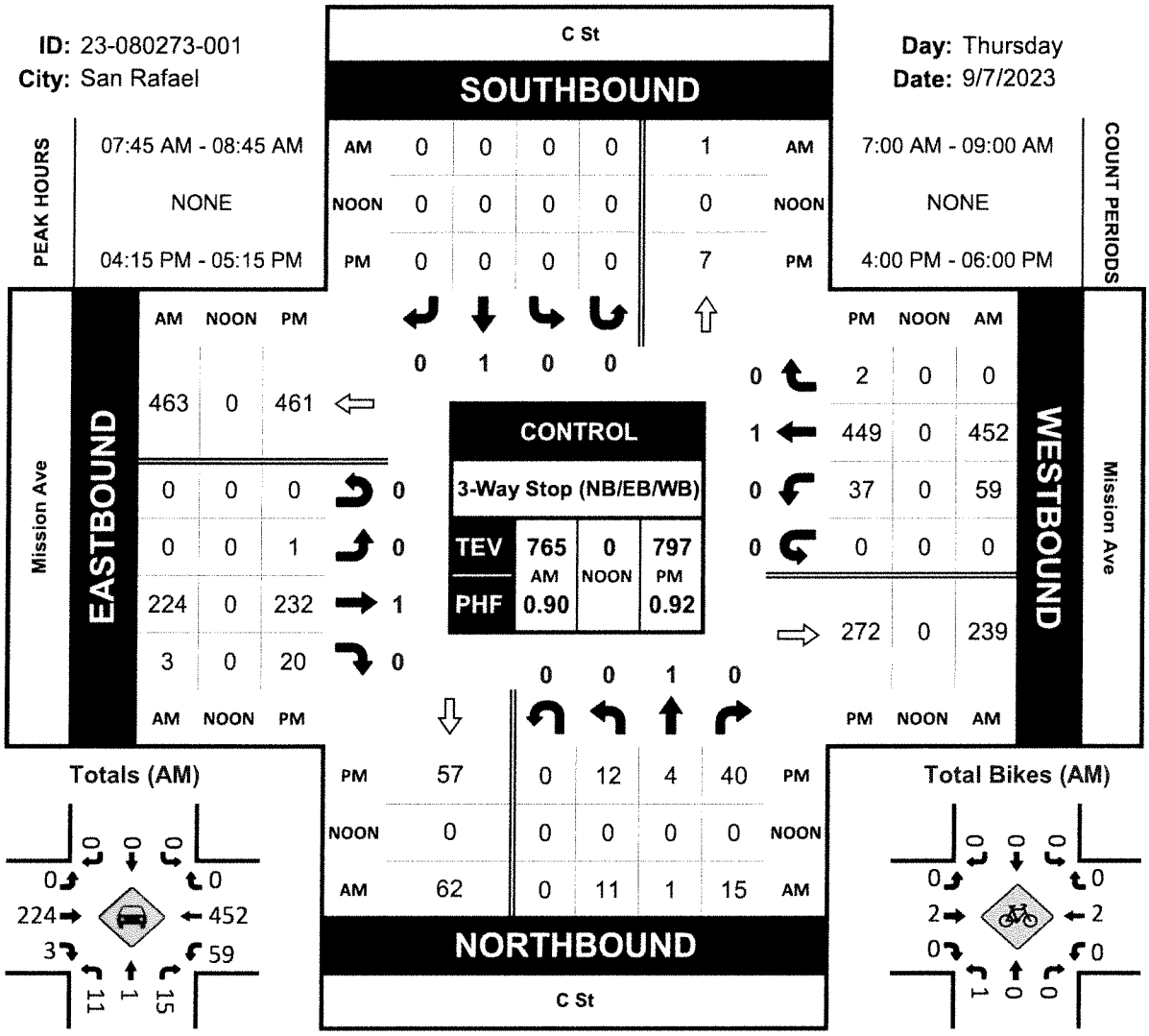
Attachment B – Turning Movement Counts

Prepared by National Data & Surveying Services

C St & Mission Ave

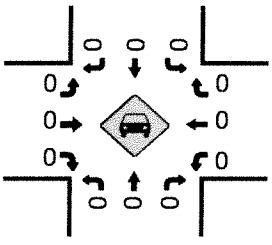
Peak Hour Turning Movement Count



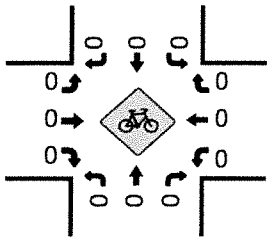
Totals (AM)

Total Bikes (AM)

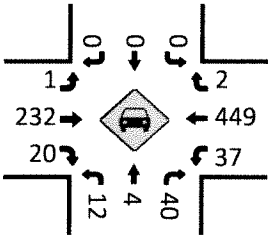
Totals (NOON)



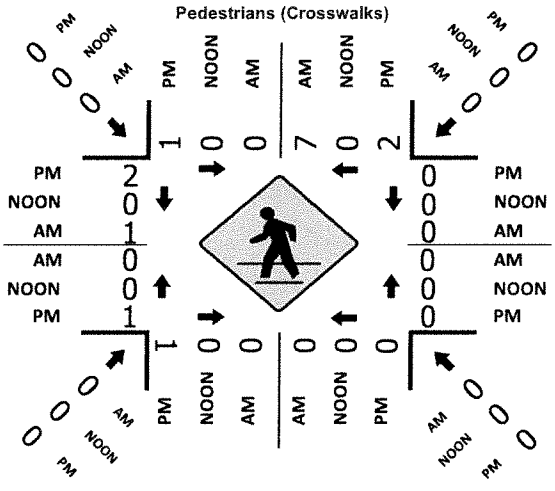
Total Bikes (NOON)



Totals (PM)



Pedestrians (Crosswalks)



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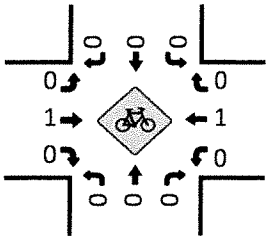


Prepared by National Data & Surveying Services

C St & 5th Ave

Peak Hour Turning Movement Count

ID: 23-080273-002
City: San Rafael

Day: Thursday
Date: 9/7/2023

PEAK HOURS

AM	08:00 AM - 09:00 AM
NOON	NONE
PM	05:00 PM - 06:00 PM

COUNT PERIODS

AM	7:00 AM - 09:00 AM
NOON	NONE
PM	4:00 PM - 06:00 PM

SOUTHBOUND (C St)

AM	27	12	7	0	34	AM
NOON	0	0	0	0	0	NOON
PM	22	22	15	0	56	PM

0 1 0 0

EASTBOUND (5th Ave)

AM	NOON	PM	
438	0	446	
0	0	0	0
5	0	12	0
345	0	370	1
6	0	12	0
AM	NOON	PM	

CONTROL

Signalized

TEV	905 AM	0 NOON	1053 PM
PHF	0.98		0.95

WESTBOUND (5th Ave)

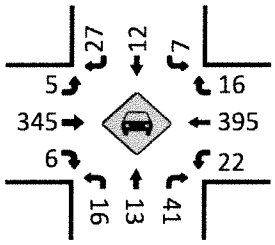
	PM	NOON	AM
0	12	0	16
1	409	0	395
0	32	0	22
0	0	0	0
	484	0	393
	PM	NOON	AM

0 0 1 0

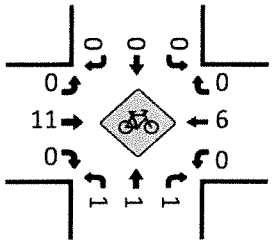
NORTHBOUND (C St)

PM	67	1	15	32	99	PM
NOON	0	0	0	0	0	NOON
AM	40	0	16	13	41	AM

Totals (AM)



Total Bikes (AM)



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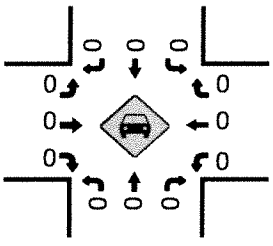

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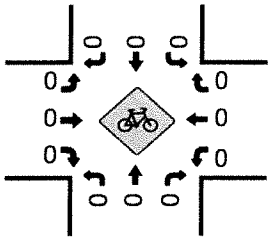
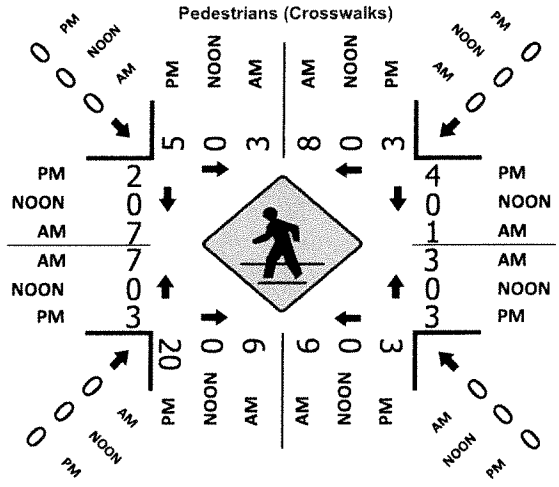
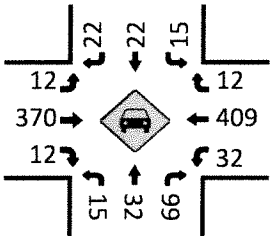


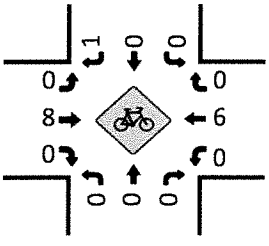
Pedestrians (Crosswalks)



Totals (PM)



Total Bikes (PM)



Prepared by National Data & Surveying Services

South Driveway & 5th Ave

Peak Hour Turning Movement Count

ID: 23-080273-004
City: San Rafael

Day: Thursday
Date: 9/7/2023

PEAK HOURS		COUNT PERIODS
08:00 AM - 09:00 AM	AM	7:00 AM - 09:00 AM
NONE	NOON	NONE
05:00 PM - 06:00 PM	PM	4:00 PM - 06:00 PM

SOUTHBOUND (South Driveway)

	↲	↓	↳	U-turn	⇧ (exit)
AM	1	0	0	0	3
NOON	0	0	0	0	0
PM	4	0	1	0	4
Lanes	0	1	0	0	

EASTBOUND (5th Ave)

Movement	AM	NOON	PM	Lanes
⇦ (exit)	430	0	456	
U-turn	0	0	1	0
Left	2	0	2	0
Through	399	0	488	1
Right	0	0	0	0

WESTBOUND (5th Ave)

Movement	Lanes	PM	NOON	AM
Right	0	1	0	1
Through	1	451	0	429
Left	0	3	0	0
U-turn	0	0	0	0
⇨ (exit)		490	0	400

NORTHBOUND (South Driveway)

	⇩ (exit)	U-turn	Left	Through	Right
Lanes		0	0	1	0
PM	3	0	0	1	1
NOON	0	0	0	0	0
AM	0	0	0	0	1

CONTROL

No Control

	AM	NOON	PM
TEV	833	0	953
PHF	0.95		0.94

Totals (AM)

Approach	Left	Through	Right	U-turn
Southbound	0	0	1	0
Eastbound	2	399	0	
Westbound	0	429	1	
Northbound	0	0	1	

Totals (NOON)

Approach	Left	Through	Right	U-turn
Southbound	0	0	0	0
Eastbound	0	0	0	
Westbound	0	0	0	
Northbound	0	0	0	

Totals (PM)

Approach	Left	Through	Right	U-turn
Southbound	1	0	4	
Eastbound	2	488	0	
Westbound	3	451	1	
Northbound	0	1	1	

Total Bikes (AM)

Approach	Left	Through	Right
Southbound	0	0	0
Eastbound	0	11	0
Westbound	0	6	0
Northbound	0	0	0

Total Bikes (NOON)

Approach	Left	Through	Right
Southbound	0	0	0
Eastbound	0	0	0
Westbound	0	0	0
Northbound	0	0	0

Total Bikes (PM)

Approach	Left	Through	Right
Southbound	0	0	0
Eastbound	0	8	0
Westbound	0	6	0
Northbound	0	0	0

Pedestrians (Crosswalks)

Crosswalk	Direction	AM	NOON	PM
North leg	→	2	0	6
North leg	←	6	0	3
South leg	→	6	0	25
South leg	←	7	0	13
West leg	↓	0	0	1
West leg	↑	0	0	0
East leg	↓	0	0	1
East leg	↑	0	0	0
NW diagonal		0	0	0
NE diagonal		0	0	0
SW diagonal		0	0	0
SE diagonal		0	0	0

Prepared by National Data & Surveying Services

C St & Private Property Union Bank Dwy/Ascendant Studios Garage

Peak Hour Turning Movement Count

ID: 23-080273-003
City: San Rafael

Day: Thursday
Date: 9/7/2023

PEAK HOURS		COUNT PERIODS
AM	07:45 AM - 08:45 AM	7:00 AM - 09:00 AM
NOON	NONE	NONE
PM	04:15 PM - 05:15 PM	4:00 PM - 06:00 PM

CONTROL: No Control

	AM	NOON	PM
TEV	107	0	134
PHF	0.79		0.84

SOUTHBOUND (C St)

	Right	Thru	Left	U-Turn	Departing
AM	16	39	5	0	27
NOON	0	0	0	0	0
PM	3	54	0	0	56
Lanes	0	1	0	0	

NORTHBOUND (C St)

	Departing	U-Turn	Left	Thru	Right
PM	71	0	4	50	0
NOON	0	0	0	0	0
AM	40	0	10	22	5
Lanes		0	0	1	0

EASTBOUND (Private Property Union Bank Dwy/Ascendant Studios Garage)

	AM	NOON	PM	Lanes
Departing	27	0	7	
U-Turn	0	0	0	0
Left	3	0	5	0
Thru	3	0	0	1
Right	0	0	14	0

WESTBOUND (Private Property Union Bank Dwy/Ascendant Studios Garage)

	Lanes	PM	NOON	AM
Right	0	1	0	2
Thru	1	0	0	1
Left	0	3	0	1
U-Turn	0	0	0	0
Departing		0	0	13

Totals

Movement	Totals (AM)	Totals (NOON)	Totals (PM)	Total Bikes (AM)	Total Bikes (NOON)	Total Bikes (PM)
SB Right	16	0	3	0	0	0
SB Thru	39	0	54	0	0	0
SB Left	5	0	0	0	0	0
EB Left	3	0	5	0	0	0
EB Thru	3	0	0	0	0	0
EB Right	0	0	14	0	0	0
WB Right	2	0	1	0	0	0
WB Thru	1	0	0	0	0	0
WB Left	1	0	3	0	0	0
NB Left	10	0	4	0	0	0
NB Thru	22	0	50	1	0	0
NB Right	5	0	0	0	0	0

Pedestrians (Crosswalks)

Crosswalk	AM	NOON	PM
North leg (eastbound direction)	0	0	0
North leg (westbound direction)	0	0	0
West leg (southbound direction)	1	0	2
West leg (northbound direction)	0	0	2
East leg (southbound direction)	0	0	0
East leg (northbound direction)	1	0	0
South leg (eastbound direction)	0	0	0
South leg (westbound direction)	0	0	1
Northwest diagonal	0	0	0
Northeast diagonal	5	0	0
Southwest diagonal	0	0	0
Southeast diagonal	0	0	2

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Attachment C – Trip Generation

Multifamily Housing (High-Rise) Close to Rail Transit (222)

Vehicle Trip Ends vs: Dwelling Units
On a: Weekday

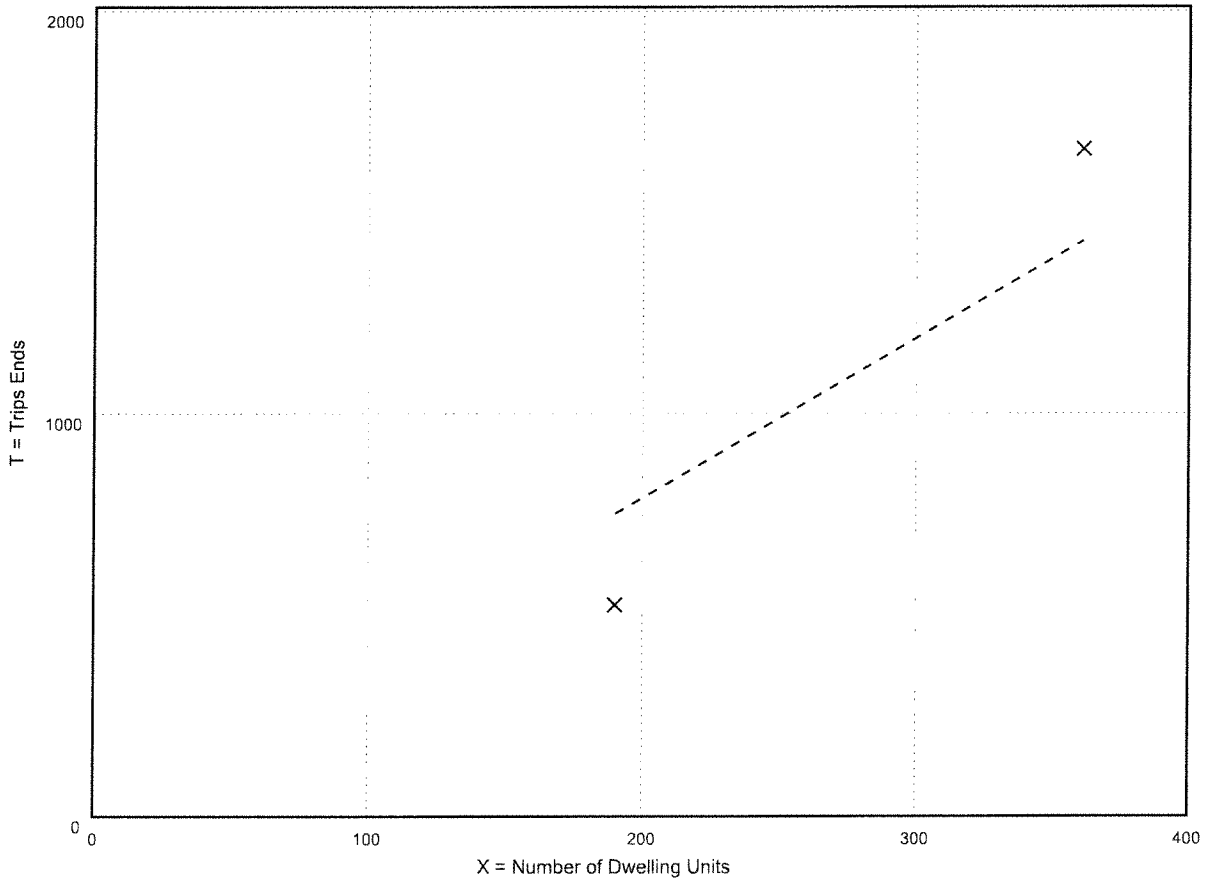
Setting/Location: General Urban/Suburban
Number of Studies: 2
Avg. Num. of Dwelling Units: 276
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
3.96	2.77 - 4.59	***

Data Plot and Equation

Caution – Small Sample Size



Fitted Curve Equation: Not Given

R^2= ***

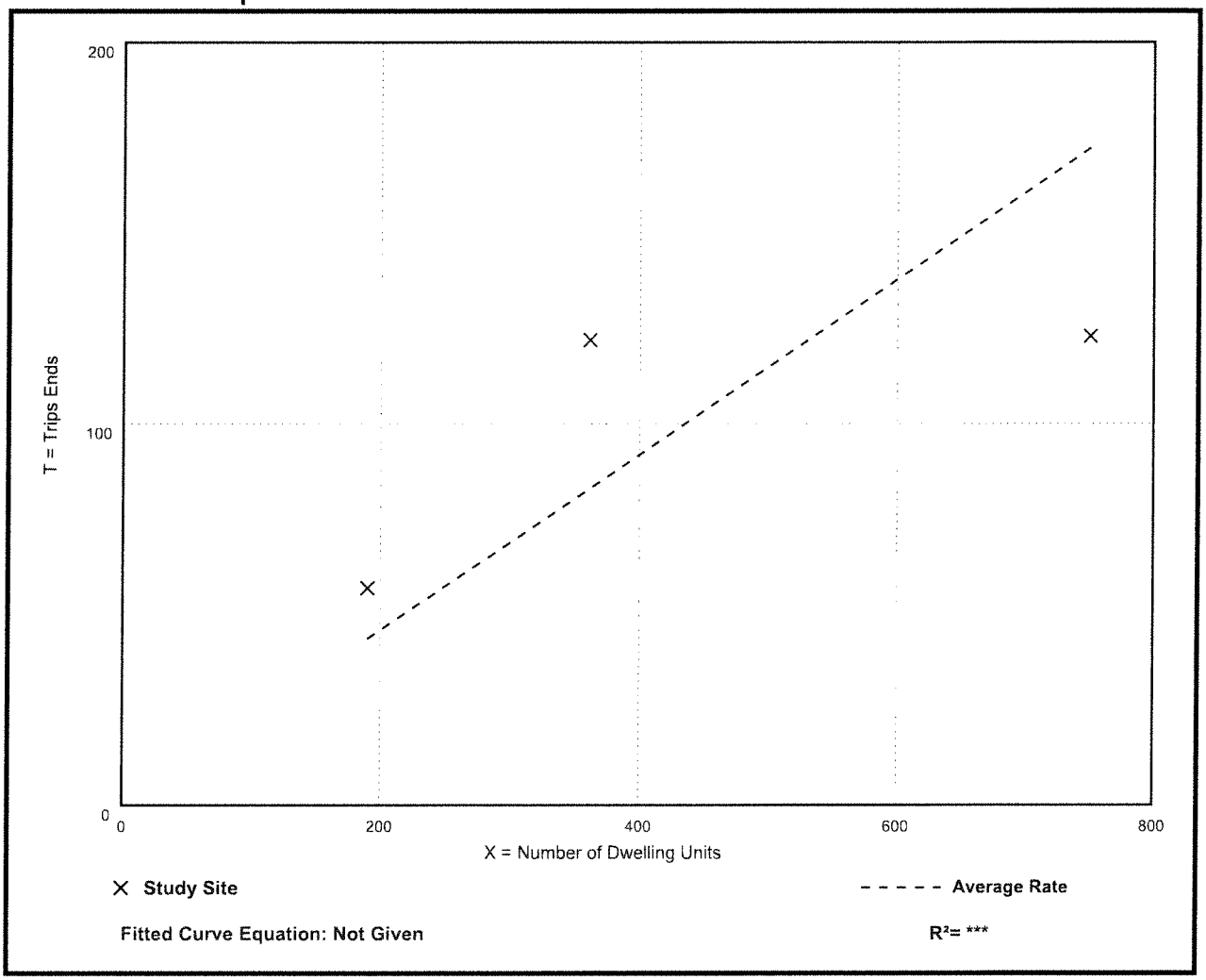
Multifamily Housing (High-Rise)
Close to Rail Transit (222)

Vehicle Trip Ends vs: Dwelling Units
On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.
Setting/Location: General Urban/Suburban
Number of Studies: 3
Avg. Num. of Dwelling Units: 434
Directional Distribution: 33% entering, 67% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.23	0.16 - 0.34	0.10

Data Plot and Equation



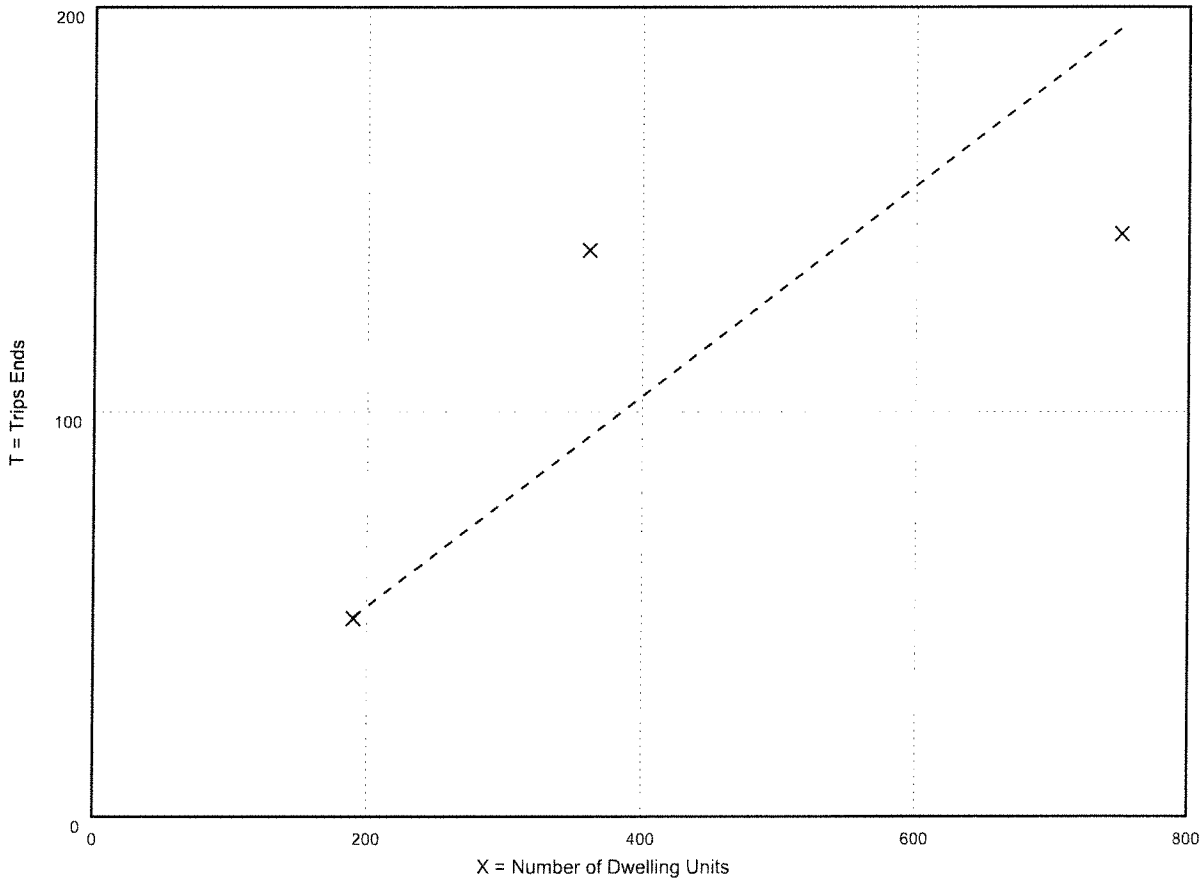
Multifamily Housing (High-Rise) Close to Rail Transit (222)

Vehicle Trip Ends vs: Dwelling Units
On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.
Setting/Location: General Urban/Suburban
Number of Studies: 3
Avg. Num. of Dwelling Units: 434
Directional Distribution: 57% entering, 43% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.26	0.19 - 0.39	0.10

Data Plot and Equation



Affordable Housing - Income Limits
(223)

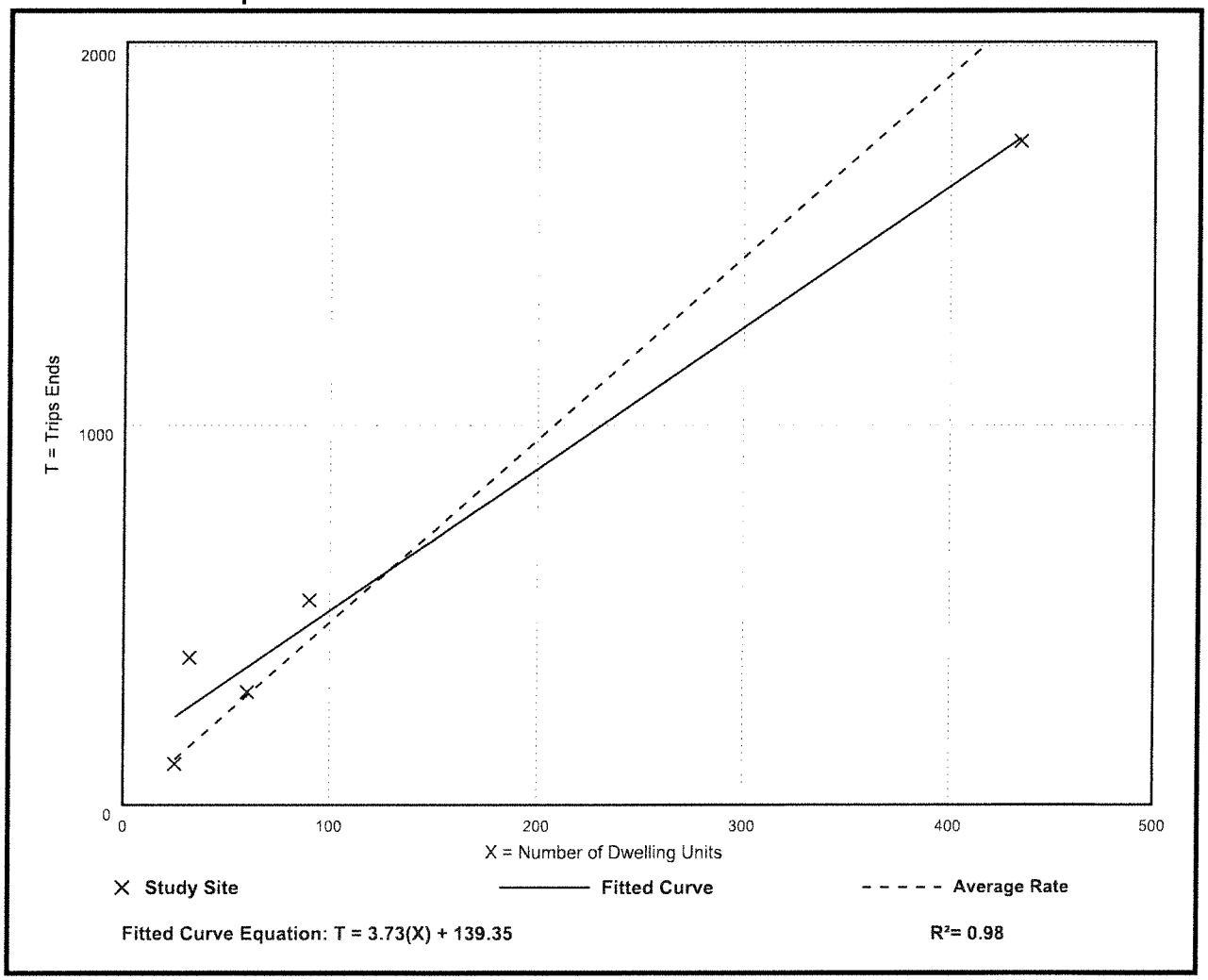
Vehicle Trip Ends vs: Dwelling Units
On a: Weekday

Setting/Location: General Urban/Suburban
Number of Studies: 5
Avg. Num. of Dwelling Units: 128
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
4.81	4.03 - 12.16	2.03

Data Plot and Equation



Fitted Curve Equation: T = 3.73(X) + 139.35

R^2= 0.98

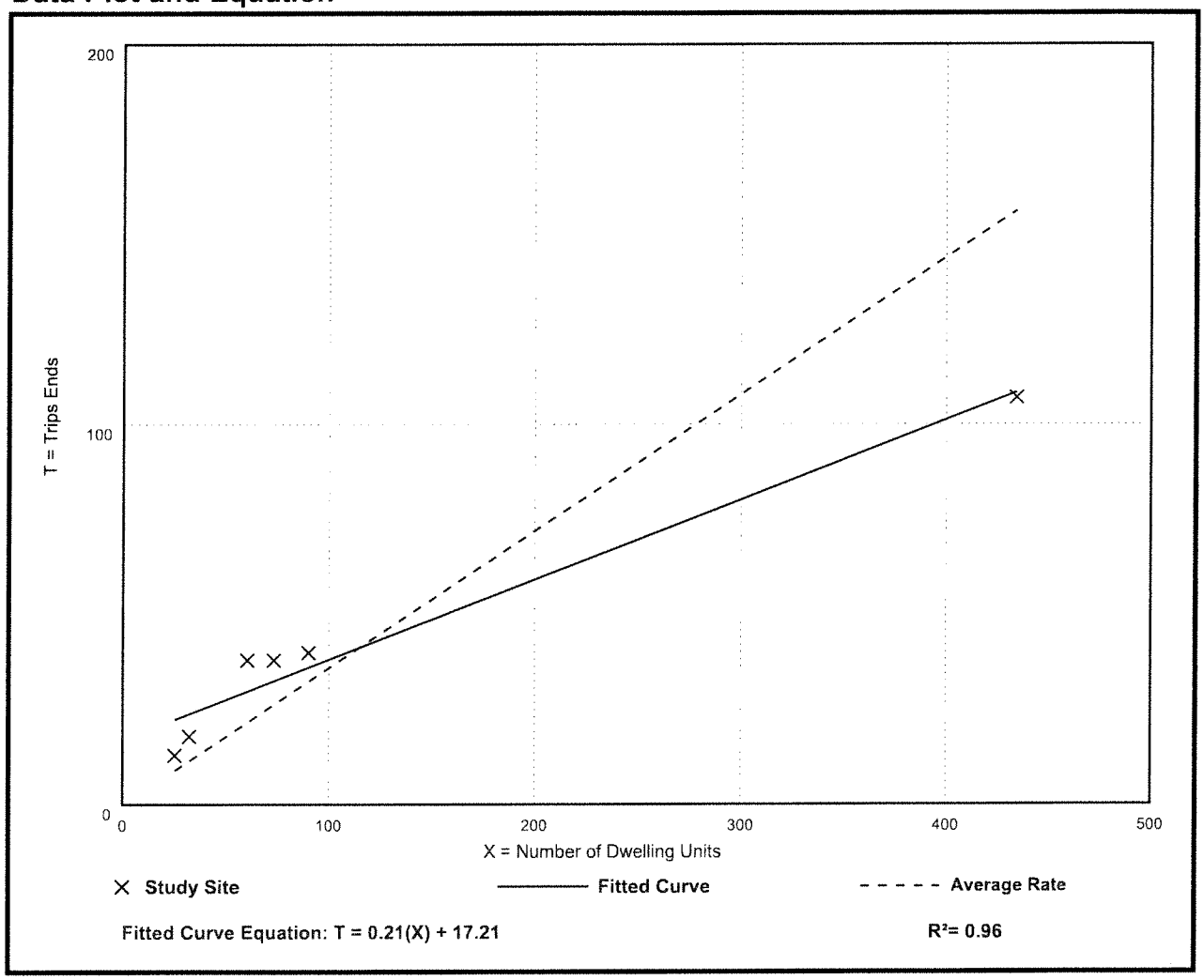
Affordable Housing - Income Limits
(223)

Vehicle Trip Ends vs: Dwelling Units
On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.
Setting/Location: General Urban/Suburban
Number of Studies: 6
Avg. Num. of Dwelling Units: 119
Directional Distribution: 29% entering, 71% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.36	0.25 - 0.63	0.16

Data Plot and Equation



Fitted Curve Equation: T = 0.21(X) + 17.21

R^2= 0.96

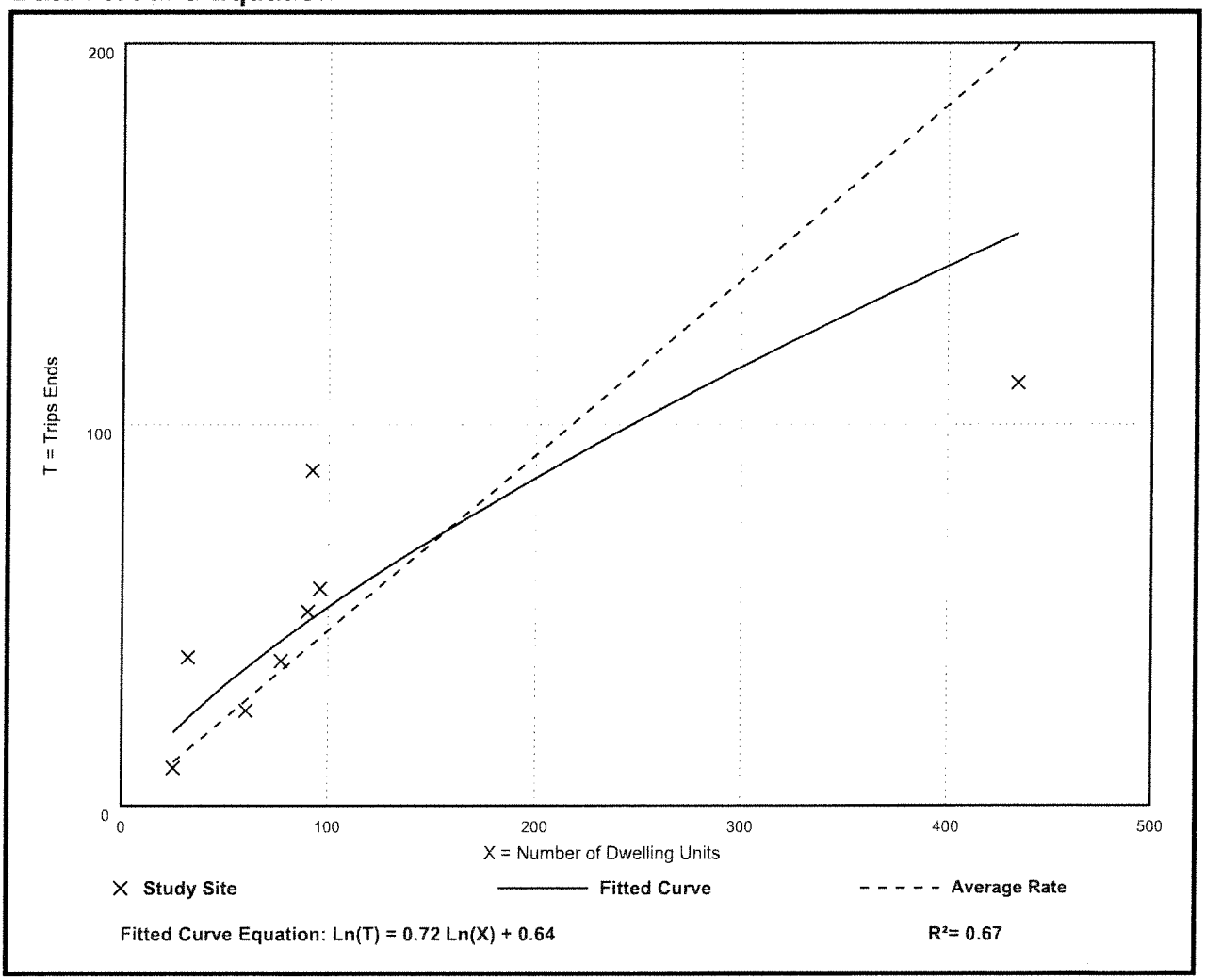
Affordable Housing - Income Limits
(223)

Vehicle Trip Ends vs: Dwelling Units
On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.
Setting/Location: General Urban/Suburban
Number of Studies: 8
Avg. Num. of Dwelling Units: 113
Directional Distribution: 59% entering, 41% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.46	0.26 - 1.22	0.28

Data Plot and Equation



Fitted Curve Equation: Ln(T) = 0.72 Ln(X) + 0.64

R^2= 0.67

Small Office Building
(712)

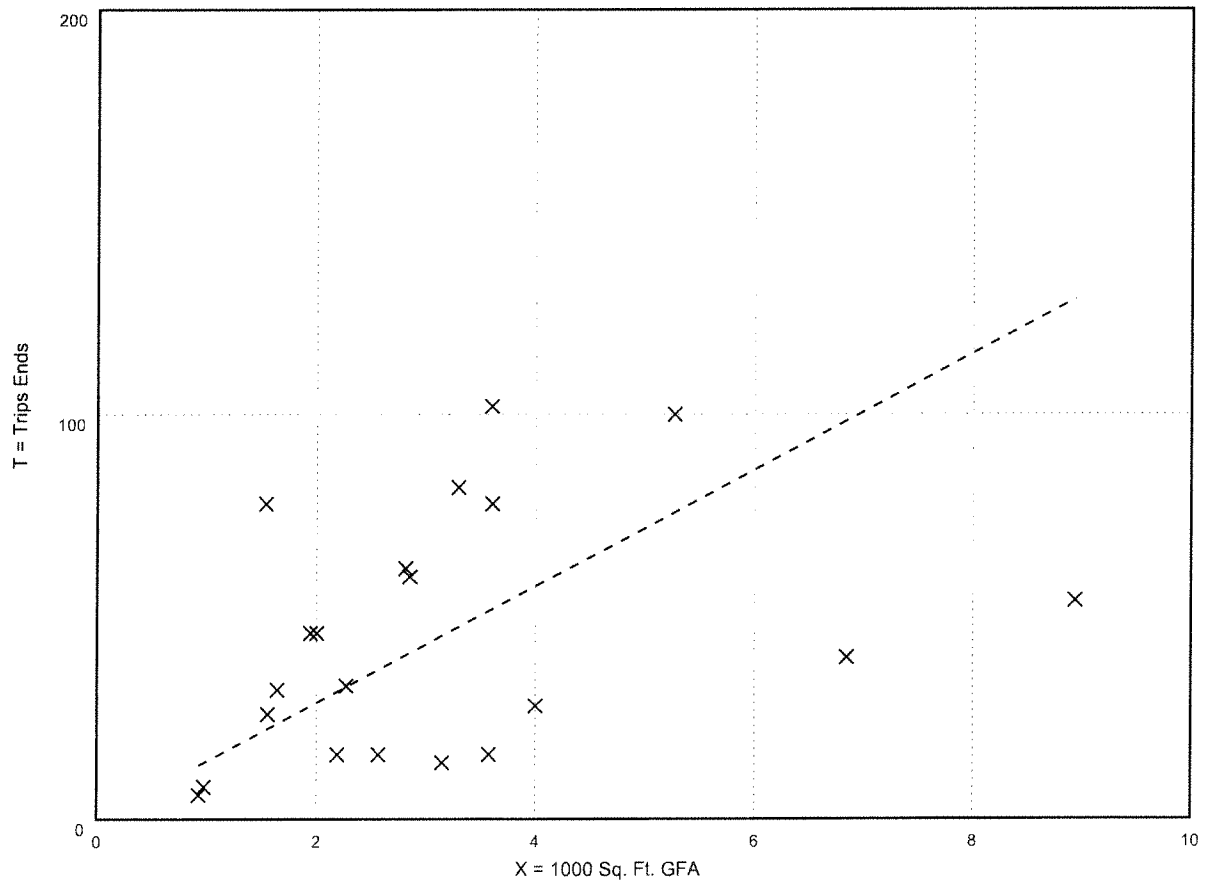
Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
On a: Weekday

Setting/Location: General Urban/Suburban
Number of Studies: 21
Avg. 1000 Sq. Ft. GFA: 3
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
14.39	4.44 - 50.91	10.16

Data Plot and Equation



Fitted Curve Equation: Not Given

R^2= ***

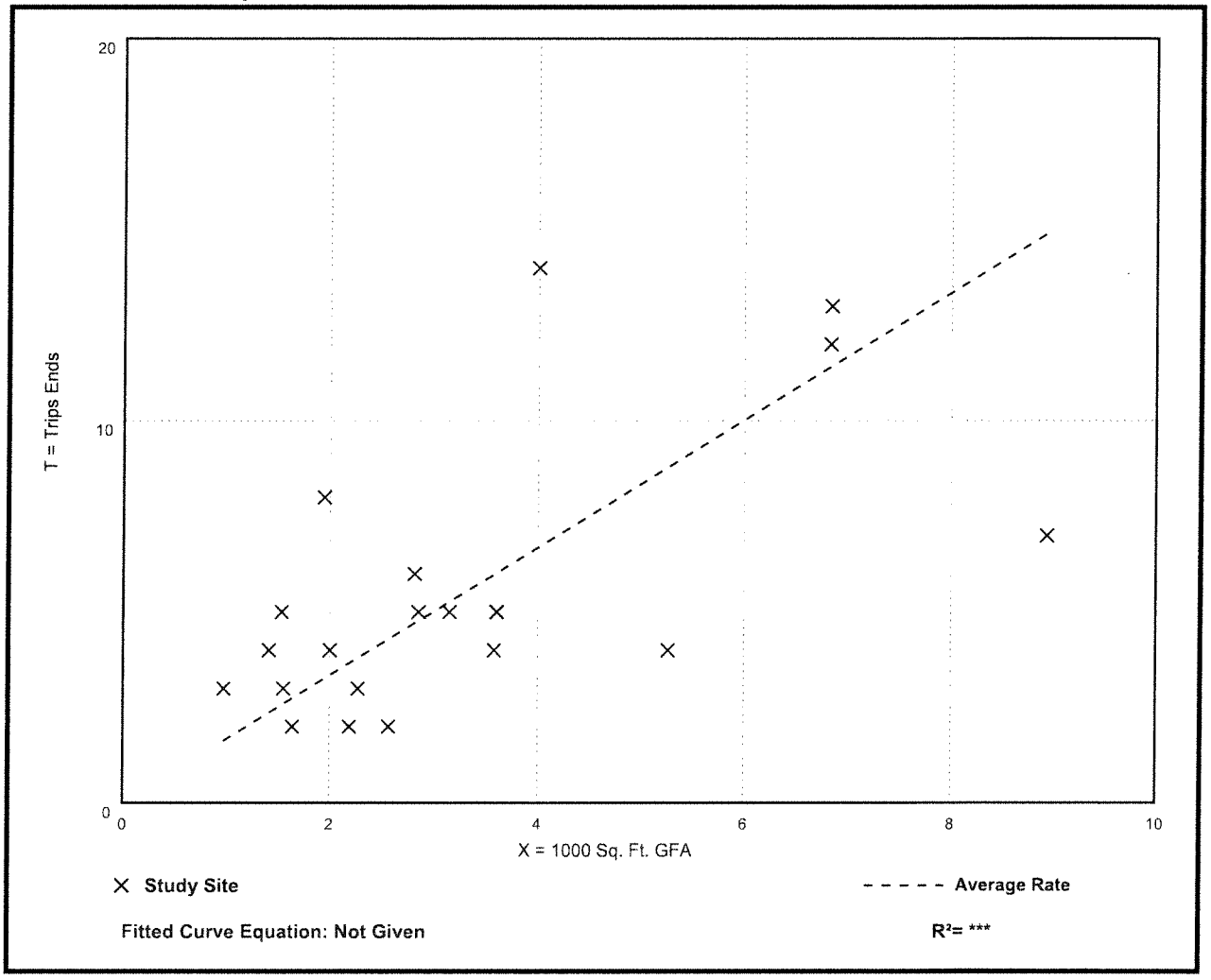
Small Office Building
(712)

Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.
Setting/Location: General Urban/Suburban
Number of Studies: 21
Avg. 1000 Sq. Ft. GFA: 3
Directional Distribution: 82% entering, 18% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
1.67	0.76 - 4.12	0.88

Data Plot and Equation



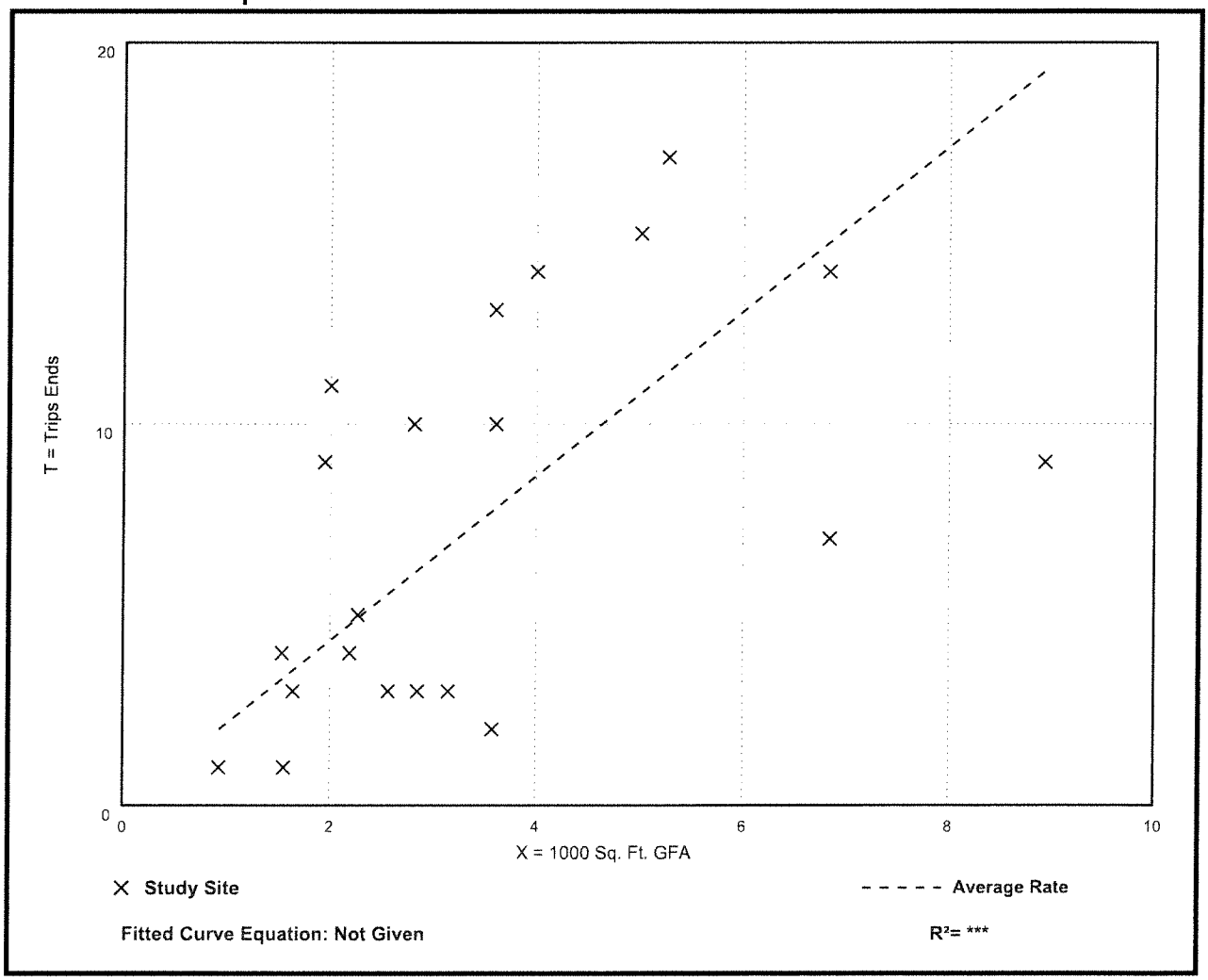
Small Office Building
(712)

Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.
Setting/Location: General Urban/Suburban
Number of Studies: 21
Avg. 1000 Sq. Ft. GFA: 3
Directional Distribution: 34% entering, 66% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
2.16	0.56 - 5.50	1.26

Data Plot and Equation



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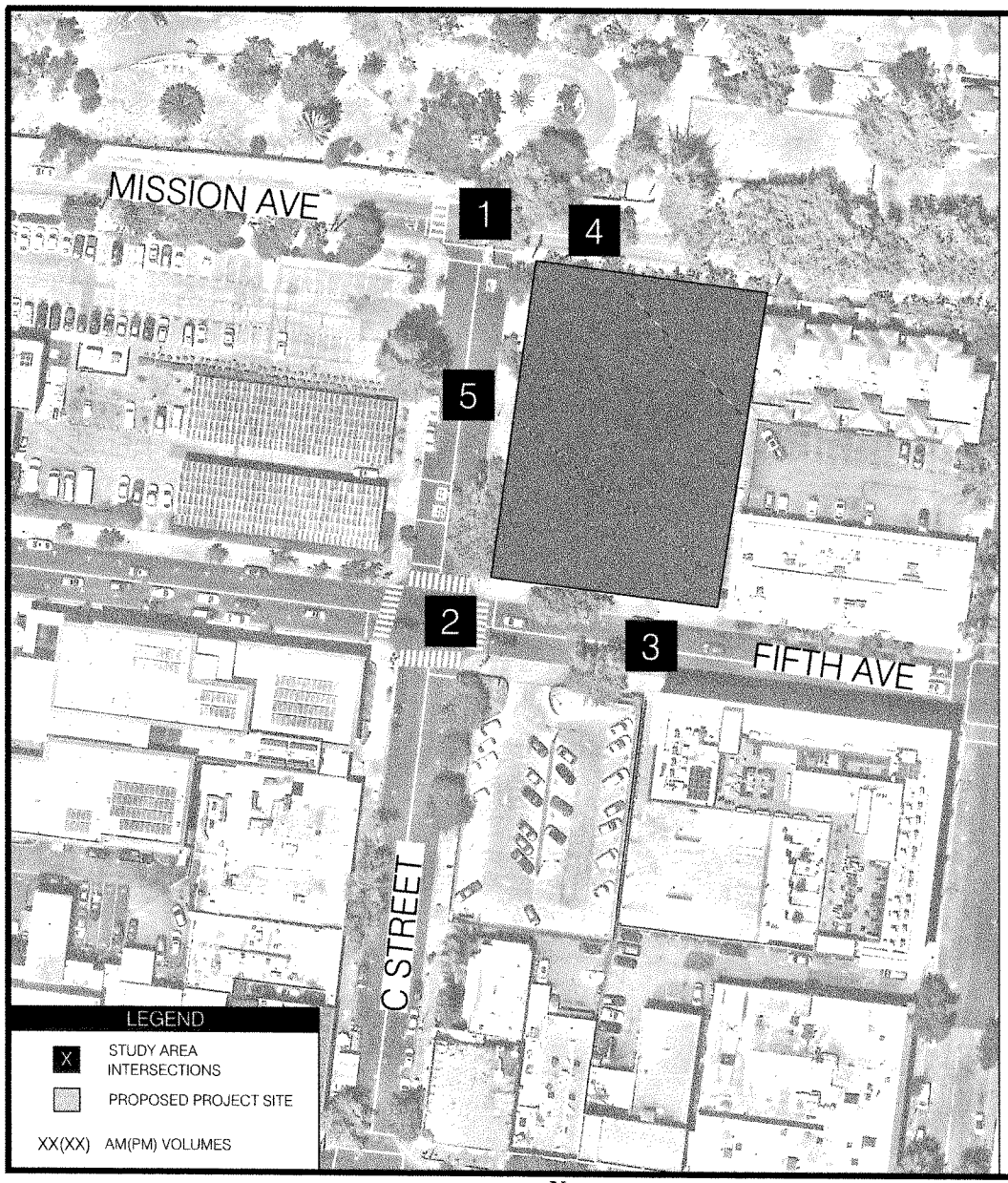
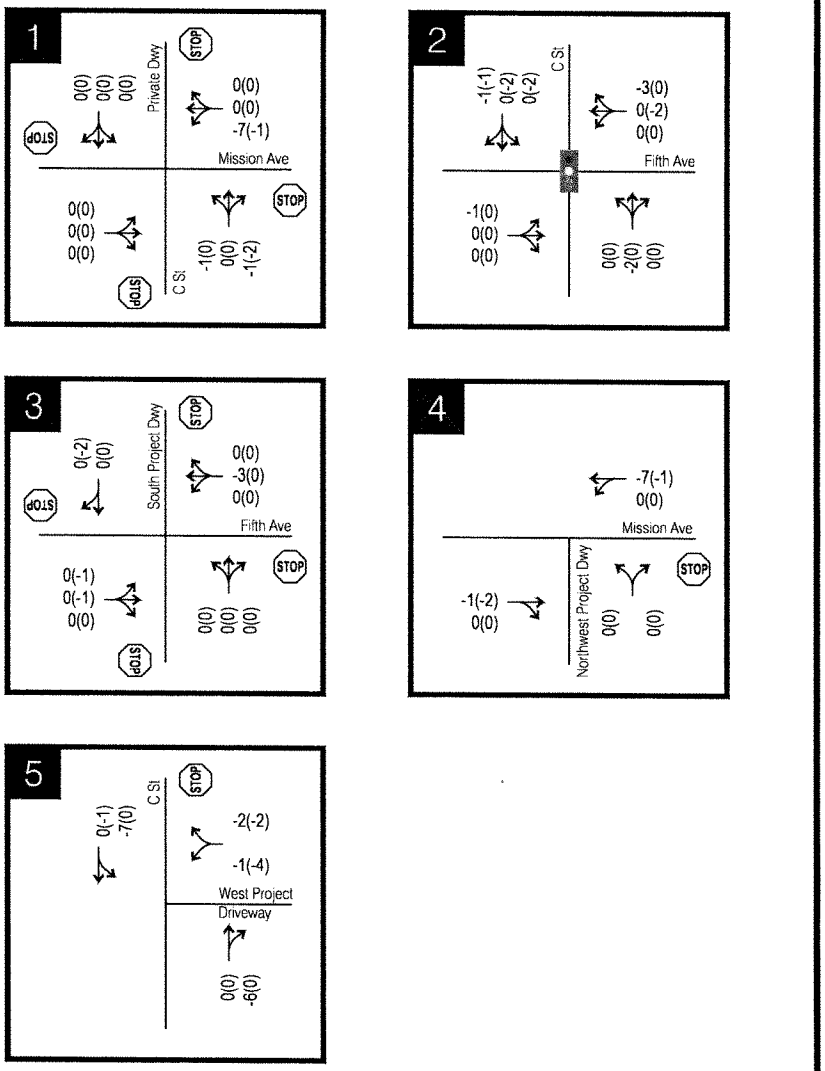
Attachment D – Additional Trip Assignment Figures





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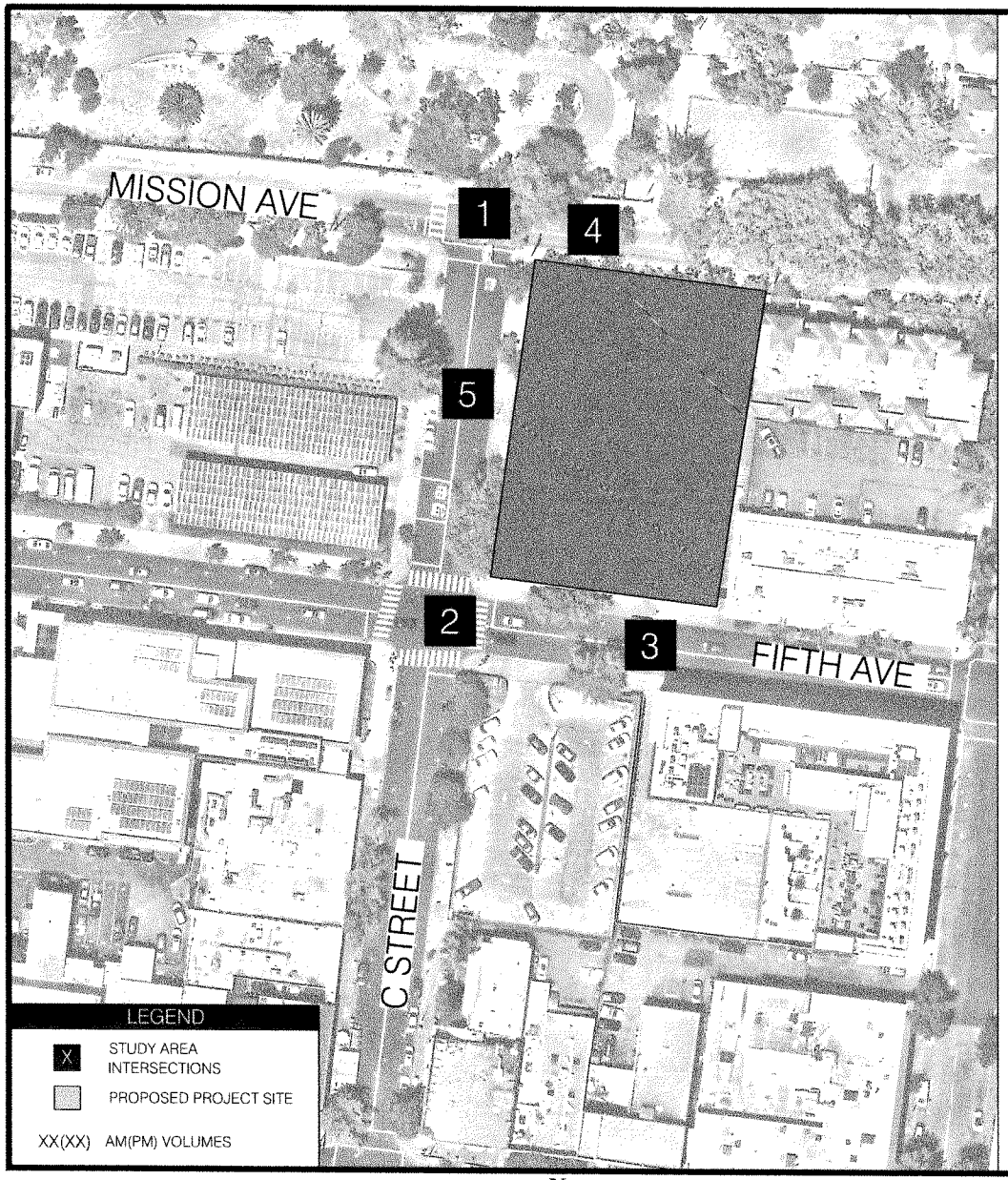
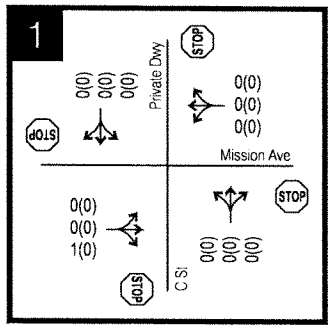
N

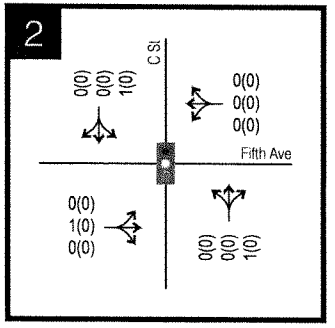
NOT TO SCALE

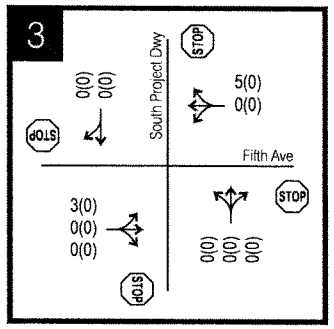
ATTACHMENT D-1

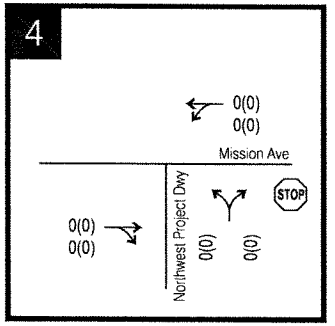
EXISTING TRIP (REMOVED) TURNING MOVEMENT VOLUMES

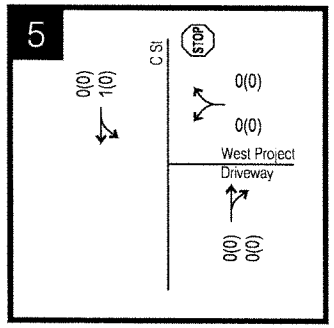












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NOT TO SCALE

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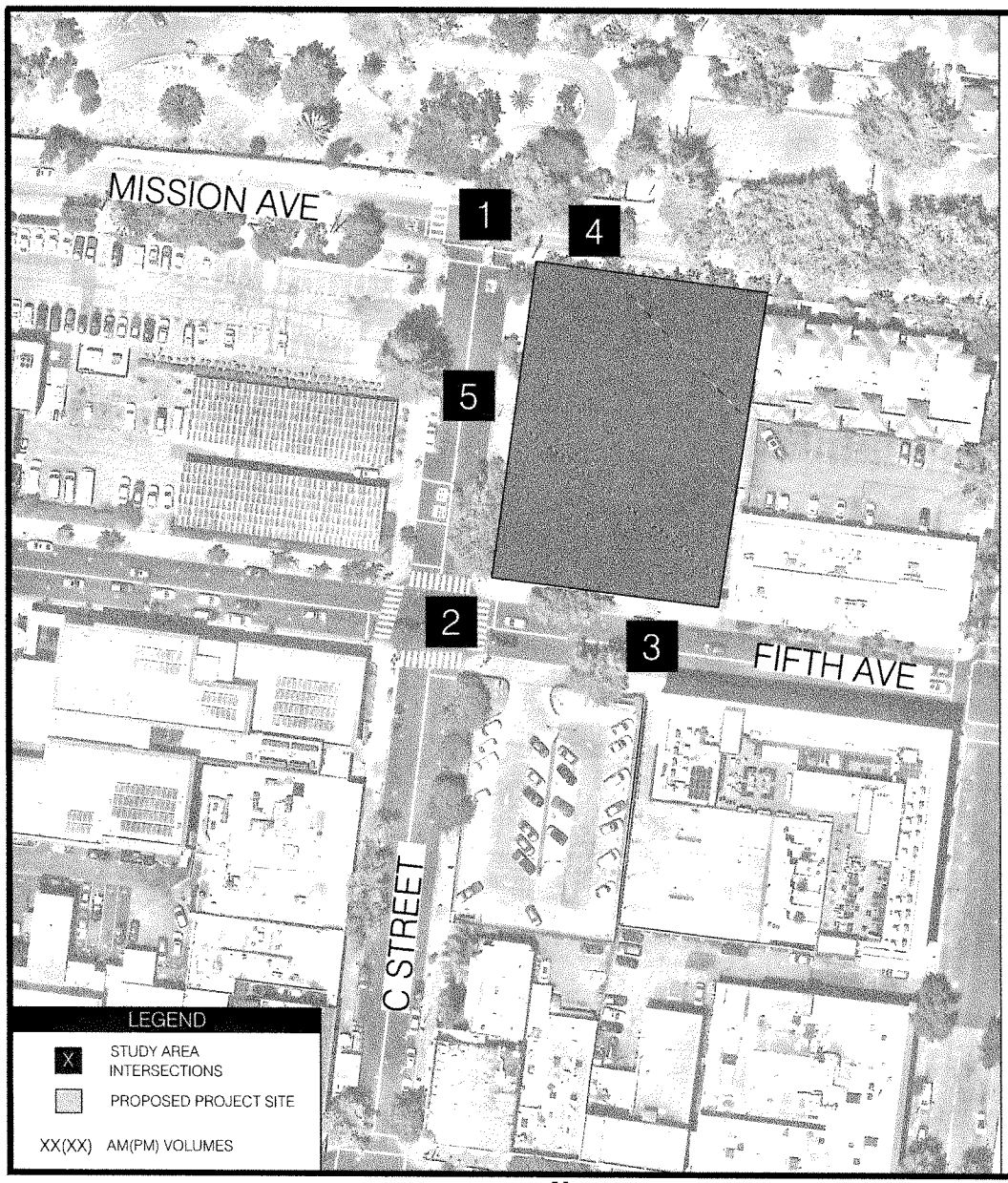
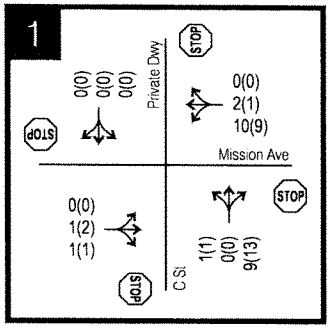
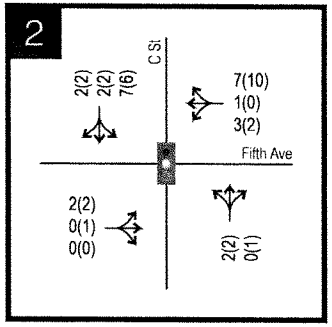
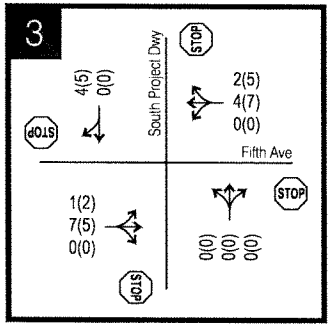
ATTACHMENT D-2

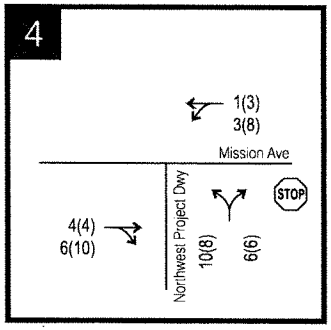
EXISTING TRIP (REDISTRIBUTION) TURNING MOVEMENT VOLUMES

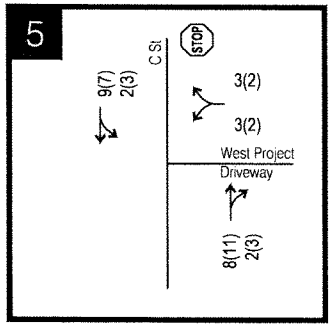












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N

NOT TO SCALE

ATTACHMENT D-3
TOTAL PROPOSED TRIP TURNING MOVEMENT VOLUMES

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Attachment E – Synchro LOS Queuing Outputs

Intersection	
Intersection Delay, s/veh	13.8
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕				
Traffic Vol, veh/h	0	224	3	59	452	0	11	1	15	0	0	0
Future Vol, veh/h	0	224	3	59	452	0	11	1	15	0	0	0
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
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	249	3	66	502	0	12	1	17	0	0	0
Number of Lanes	0	1	0	0	1	0	0	1	0	0	0	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	1
HCM Control Delay, s/veh	9.7	15.9	8.7
HCM LOS	A	C	A

Lane	NBLn1	EBLn1	WBLn1
Vol Left, %	41%	0%	12%
Vol Thru, %	4%	99%	88%
Vol Right, %	56%	1%	0%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	27	227	511
LT Vol	11	0	59
Through Vol	1	224	452
RT Vol	15	3	0
Lane Flow Rate	30	252	568
Geometry Grp	1	1	1
Degree of Util (X)	0.045	0.32	0.679
Departure Headway (Hd)	5.435	4.572	4.303
Convergence, Y/N	Yes	Yes	Yes
Cap	657	787	840
Service Time	3.481	2.593	2.319
HCM Lane V/C Ratio	0.046	0.32	0.676
HCM Control Delay, s/veh	8.7	9.7	15.9
HCM Lane LOS	A	A	C
HCM 95th-tile Q	0.1	1.4	5.5

Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	363	441	71	47
v/c Ratio	0.23	0.29	0.38	0.26
Control Delay (s/veh)	2.5	2.8	25.1	24.1
Queue Delay	0.0	0.0	0.0	0.0
Total Delay (s/veh)	2.5	2.8	25.1	24.1
Queue Length 50th (ft)	35	45	16	10
Queue Length 95th (ft)	68	87	55	42
Internal Link Dist (ft)	284	75	289	41
Turn Bay Length (ft)				
Base Capacity (vph)	1552	1514	469	471
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.23	0.29	0.15	0.10

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	5	345	6	22	395	16	16	13	41	7	12	27
Future Volume (veh/h)	5	345	6	22	395	16	16	13	41	7	12	27
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.97	0.96		0.93	0.96		0.95
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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	5	352	6	22	403	16	16	13	42	7	12	28
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	45	1388	23	79	1297	50	74	60	124	59	75	129
Arrive On Green	0.76	0.76	0.76	0.76	0.76	0.76	0.14	0.14	0.14	0.14	0.14	0.14
Sat Flow, veh/h	6	1821	31	48	1702	66	186	444	912	95	550	951
Grp Volume(v), veh/h	363	0	0	441	0	0	71	0	0	47	0	0
Grp Sat Flow(s),veh/h/ln	1858	0	0	1816	0	0	1541	0	0	1596	0	0
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	5.2	0.0	0.0	6.7	0.0	0.0	3.6	0.0	0.0	2.3	0.0	0.0
Prop In Lane	0.01		0.02	0.05		0.04	0.23		0.59	0.15		0.60
Lane Grp Cap(c), veh/h	1456	0	0	1426	0	0	258	0	0	262	0	0
V/C Ratio(X)	0.25	0.00	0.00	0.31	0.00	0.00	0.28	0.00	0.00	0.18	0.00	0.00
Avail Cap(c_a), veh/h	1456	0	0	1426	0	0	476	0	0	489	0	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	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	3.2	0.0	0.0	3.3	0.0	0.0	35.2	0.0	0.0	34.6	0.0	0.0
Incr Delay (d2), s/veh	0.4	0.0	0.0	0.6	0.0	0.0	0.6	0.0	0.0	0.3	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	1.6	0.0	0.0	2.1	0.0	0.0	1.4	0.0	0.0	0.9	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	3.6	0.0	0.0	3.9	0.0	0.0	35.7	0.0	0.0	34.9	0.0	0.0
LnGrp LOS	A			A			D			C		
Approach Vol, veh/h		363			441			71			47	
Approach Delay, s/veh		3.6			3.9			35.7			34.9	
Approach LOS		A			A			D			C	

Timer - Assigned Phs	2	4	6	8
Phs Duration (G+Y+Rc), s	73.2	16.8	73.2	16.8
Change Period (Y+Rc), s	4.6	4.6	4.6	4.6
Max Green Setting (Gmax), s	55.4	25.4	55.4	25.4
Max Q Clear Time (g_c+I1), s	7.2	4.3	8.7	5.6
Green Ext Time (p_c), s	1.6	0.2	2.1	0.3

Intersection Summary	
HCM 7th Control Delay, s/veh	7.8
HCM 7th LOS	A

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✣			✣			✣			✣	
Traffic Vol, veh/h	2	399	0	0	429	1	0	0	1	0	0	1
Future Vol, veh/h	2	399	0	0	429	1	0	0	1	0	0	1
Conflicting Peds, #/hr	8	0	13	13	0	8	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
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	2	420	0	0	452	1	0	0	1	0	0	1

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	461	0	0	433	0	0	889	898	433	884	897	460
Stage 1	-	-	-	-	-	-	437	437	-	460	460	-
Stage 2	-	-	-	-	-	-	452	461	-	424	437	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
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	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1100	-	-	1127	-	-	264	279	623	266	279	601
Stage 1	-	-	-	-	-	-	598	579	-	581	566	-
Stage 2	-	-	-	-	-	-	587	565	-	608	579	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1092	-	-	1113	-	-	260	273	615	263	273	597
Mov Cap-2 Maneuver	-	-	-	-	-	-	260	273	-	263	273	-
Stage 1	-	-	-	-	-	-	589	571	-	577	561	-
Stage 2	-	-	-	-	-	-	586	561	-	605	571	-

Approach	EB	WB	NB	SB
HCM Control Delay, s/v	0.04	0	10.86	11.04
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	615	9	-	-	1113	-	-	597
HCM Lane V/C Ratio	0.002	0.002	-	-	-	-	-	0.002
HCM Control Delay (s/veh)	10.9	8.3	0	-	0	-	-	11
HCM Lane LOS	B	A	A	-	A	-	-	B
HCM 95th %tile Q(veh)	0	0	-	-	0	-	-	0

Intersection	
Intersection Delay, s/veh	13.1
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕				
Traffic Vol, veh/h	1	232	20	37	449	2	12	4	40	0	0	0
Future Vol, veh/h	1	232	20	37	449	2	12	4	40	0	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	252	22	40	488	2	13	4	43	0	0	0
Number of Lanes	0	1	0	0	1	0	0	1	0	0	0	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	1
HCM Control Delay, s/veh	10.1	15.2	8.9
HCM LOS	B	C	A

Lane	NBLn1	EBLn1	WBLn1
Vol Left, %	21%	0%	8%
Vol Thru, %	7%	92%	92%
Vol Right, %	71%	8%	0%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	56	253	488
LT Vol	12	1	37
Through Vol	4	232	449
RT Vol	40	20	2
Lane Flow Rate	61	275	530
Geometry Grp	1	1	1
Degree of Util (X)	0.089	0.351	0.648
Departure Headway (Hd)	5.282	4.594	4.4
Convergence, Y/N	Yes	Yes	Yes
Cap	675	781	822
Service Time	3.338	2.627	2.428
HCM Lane V/C Ratio	0.09	0.352	0.645
HCM Control Delay, s/veh	8.9	10.1	15.2
HCM Lane LOS	A	B	C
HCM 95th-tile Q	0.3	1.6	4.9

Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	415	478	155	62
v/c Ratio	0.29	0.34	0.58	0.37
Control Delay (s/veh)	3.5	3.8	23.3	31.3
Queue Delay	0.0	0.0	0.0	0.0
Total Delay (s/veh)	3.5	3.8	23.3	31.3
Queue Length 50th (ft)	43	52	28	21
Queue Length 95th (ft)	99	121	83	56
Internal Link Dist (ft)	284	75	289	31
Turn Bay Length (ft)				
Base Capacity (vph)	1436	1393	539	413
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.29	0.34	0.29	0.15

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	12	370	12	32	409	12	16	32	99	15	22	22
Future Volume (veh/h)	12	370	12	32	409	12	16	32	99	15	22	22
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	0.99		0.96	0.99		0.96	0.98		0.98	0.99		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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	13	389	13	34	431	13	17	34	104	16	23	23
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	58	1325	43	103	1251	37	58	62	154	88	114	90
Arrive On Green	0.75	0.75	0.75	0.75	0.75	0.75	0.14	0.14	0.14	0.14	0.14	0.14
Sat Flow, veh/h	22	1755	57	80	1657	49	95	433	1078	266	798	628
Grp Volume(v), veh/h	415	0	0	478	0	0	155	0	0	62	0	0
Grp Sat Flow(s),veh/h/ln	1835	0	0	1786	0	0	1606	0	0	1692	0	0
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	0.0	2.4	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	6.4	0.0	0.0	7.6	0.0	0.0	8.1	0.0	0.0	2.9	0.0	0.0
Prop In Lane	0.03		0.03	0.07		0.03	0.11		0.67	0.26		0.37
Lane Grp Cap(c), veh/h	1426	0	0	1391	0	0	274	0	0	292	0	0
V/C Ratio(X)	0.29	0.00	0.00	0.34	0.00	0.00	0.57	0.00	0.00	0.21	0.00	0.00
Avail Cap(c_a), veh/h	1426	0	0	1391	0	0	511	0	0	524	0	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	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	3.5	0.0	0.0	3.6	0.0	0.0	36.5	0.0	0.0	34.3	0.0	0.0
Incr Delay (d2), s/veh	0.5	0.0	0.0	0.7	0.0	0.0	1.8	0.0	0.0	0.4	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	2.0	0.0	0.0	2.5	0.0	0.0	3.4	0.0	0.0	1.2	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	4.0	0.0	0.0	4.3	0.0	0.0	38.3	0.0	0.0	34.6	0.0	0.0
LnGrp LOS	A			A			D			C		
Approach Vol, veh/h		415			478			155			62	
Approach Delay, s/veh		4.0			4.3			38.3			34.6	
Approach LOS		A			A			D			C	

Timer - Assigned Phs	2	4	6	8
Phs Duration (G+Y+Rc), s	72.5	17.5	72.5	17.5
Change Period (Y+Rc), s	4.6	4.6	4.6	4.6
Max Green Setting (Gmax), s	54.4	26.4	54.4	26.4
Max Q Clear Time (g_c+I1), s	8.4	4.9	9.6	10.1
Green Ext Time (p_c), s	2.0	0.3	2.4	0.8

Intersection Summary	
HCM 7th Control Delay, s/veh	10.6
HCM 7th LOS	B

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	3	488	0	3	451	1	0	1	1	1	0	4
Future Vol, veh/h	3	488	0	3	451	1	0	1	1	1	0	4
Conflicting Peds, #/hr	9	0	38	38	0	9	1	0	1	1	0	1
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
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	3	519	0	3	480	1	0	1	1	1	0	4

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	490	0	0	557	0	0	1051	1060	558	1023	1059	490
Stage 1	-	-	-	-	-	-	564	564	-	496	496	-
Stage 2	-	-	-	-	-	-	487	496	-	527	564	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
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	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1073	-	-	1014	-	-	205	224	529	214	224	578
Stage 1	-	-	-	-	-	-	511	509	-	556	546	-
Stage 2	-	-	-	-	-	-	562	545	-	534	509	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1064	-	-	977	-	-	194	212	509	209	212	573
Mov Cap-2 Maneuver	-	-	-	-	-	-	194	212	-	209	212	-
Stage 1	-	-	-	-	-	-	490	488	-	549	538	-
Stage 2	-	-	-	-	-	-	555	538	-	529	488	-

Approach	EB	WB	NB	SB
HCM Control Delay, s/v	0.05	0.06	17.1	13.59
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	300	11	-	-	12	-	-	425
HCM Lane V/C Ratio	0.007	0.003	-	-	0.003	-	-	0.013
HCM Control Delay (s/veh)	17.1	8.4	0	-	8.7	0	-	13.6
HCM Lane LOS	C	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0	0	-	-	0	-	-	0

Intersection	
Intersection Delay, s/veh	14.1
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕				
Traffic Vol, veh/h	0	225	5	62	454	0	11	1	23	0	0	0
Future Vol, veh/h	0	225	5	62	454	0	11	1	23	0	0	0
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
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	250	6	69	504	0	12	1	26	0	0	0
Number of Lanes	0	1	0	0	1	0	0	1	0	0	0	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	1
HCM Control Delay, s/veh	9.9	16.4	8.8
HCM LOS	A	C	A

Lane	NBLn1	EBLn1	WBLn1
Vol Left, %	31%	0%	12%
Vol Thru, %	3%	98%	88%
Vol Right, %	66%	2%	0%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	35	230	516
LT Vol	11	0	62
Through Vol	1	225	454
RT Vol	23	5	0
Lane Flow Rate	39	256	573
Geometry Grp	1	1	1
Degree of Util (X)	0.058	0.327	0.69
Departure Headway (Hd)	5.379	4.602	4.333
Convergence, Y/N	Yes	Yes	Yes
Cap	663	782	837
Service Time	3.43	2.627	2.353
HCM Lane V/C Ratio	0.059	0.327	0.685
HCM Control Delay, s/veh	8.8	9.9	16.4
HCM Lane LOS	A	A	C
HCM 95th-tile Q	0.2	1.4	5.7

Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	365	450	72	58
v/c Ratio	0.24	0.30	0.38	0.33
Control Delay (s/veh)	2.5	2.8	24.8	27.6
Queue Delay	0.0	0.0	0.0	0.0
Total Delay (s/veh)	2.5	2.8	24.8	27.6
Queue Length 50th (ft)	35	46	16	16
Queue Length 95th (ft)	69	90	55	51
Internal Link Dist (ft)	284	75	289	41
Turn Bay Length (ft)				
Base Capacity (vph)	1548	1502	473	455
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.24	0.30	0.15	0.13

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	6	346	6	25	396	20	16	13	42	15	14	28
Future Volume (veh/h)	6	346	6	25	396	20	16	13	42	15	14	28
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.97	0.96		0.93	0.96		0.95
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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	6	353	6	26	404	20	16	13	43	15	14	29
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	47	1384	23	88	1266	61	74	60	126	83	75	107
Arrive On Green	0.76	0.76	0.76	0.76	0.76	0.76	0.14	0.14	0.14	0.14	0.14	0.14
Sat Flow, veh/h	8	1818	31	60	1663	80	182	438	920	238	549	786
Grp Volume(v), veh/h	365	0	0	450	0	0	72	0	0	58	0	0
Grp Sat Flow(s),veh/h/ln	1856	0	0	1803	0	0	1541	0	0	1573	0	0
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	5.2	0.0	0.0	6.9	0.0	0.0	3.6	0.0	0.0	2.8	0.0	0.0
Prop In Lane	0.02		0.02	0.06		0.04	0.22		0.60	0.26		0.50
Lane Grp Cap(c), veh/h	1454	0	0	1415	0	0	259	0	0	265	0	0
V/C Ratio(X)	0.25	0.00	0.00	0.32	0.00	0.00	0.28	0.00	0.00	0.22	0.00	0.00
Avail Cap(c_a), veh/h	1454	0	0	1415	0	0	476	0	0	485	0	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	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	3.2	0.0	0.0	3.4	0.0	0.0	35.1	0.0	0.0	34.8	0.0	0.0
Incr Delay (d2), s/veh	0.4	0.0	0.0	0.6	0.0	0.0	0.6	0.0	0.0	0.4	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	1.7	0.0	0.0	2.2	0.0	0.0	1.5	0.0	0.0	1.2	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	3.6	0.0	0.0	4.0	0.0	0.0	35.7	0.0	0.0	35.2	0.0	0.0
LnGrp LOS	A			A			D			D		
Approach Vol, veh/h		365			450			72			58	
Approach Delay, s/veh		3.6			4.0			35.7			35.2	
Approach LOS		A			A			D			D	

Timer - Assigned Phs	2	4	6	8
Phs Duration (G+Y+Rc), s	73.1	16.9	73.1	16.9
Change Period (Y+Rc), s	4.6	4.6	4.6	4.6
Max Green Setting (Gmax), s	55.4	25.4	55.4	25.4
Max Q Clear Time (g_c+I1), s	7.2	4.8	8.9	5.6
Green Ext Time (p_c), s	1.7	0.2	2.2	0.3

Intersection Summary	
HCM 7th Control Delay, s/veh	8.2
HCM 7th LOS	A

Intersection												
Int Delay, s/veh	0.1											

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	6	406	0	0	430	8	0	0	1	0	0	5
Future Vol, veh/h	6	406	0	0	430	8	0	0	1	0	0	5
Conflicting Peds, #/hr	8	0	13	13	0	8	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
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	6	427	0	0	453	8	0	0	1	0	0	5

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	469	0	0	440	0	0	906	922	440	905	918	465
Stage 1	-	-	-	-	-	-	453	453	-	465	465	-
Stage 2	-	-	-	-	-	-	453	469	-	440	453	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
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	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1093	-	-	1120	-	-	257	270	617	257	272	598
Stage 1	-	-	-	-	-	-	586	570	-	578	563	-
Stage 2	-	-	-	-	-	-	587	561	-	596	570	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1084	-	-	1106	-	-	250	263	609	253	264	593
Mov Cap-2 Maneuver	-	-	-	-	-	-	250	263	-	253	264	-
Stage 1	-	-	-	-	-	-	575	559	-	573	559	-
Stage 2	-	-	-	-	-	-	581	556	-	590	559	-

Approach	EB	WB	NB	SB
HCM Control Delay, s/v	0.12	0	10.92	11.13
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	609	26	-	-	1106	-	-	593
HCM Lane V/C Ratio	0.002	0.006	-	-	-	-	-	0.009
HCM Control Delay (s/veh)	10.9	8.3	0	-	0	-	-	11.1
HCM Lane LOS	B	A	A	-	A	-	-	B
HCM 95th %tile Q(veh)	0	0	-	-	0	-	-	0

Intersection	
Int Delay, s/veh	0.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	242	6	3	505	10	6
Future Vol, veh/h	242	6	3	505	10	6
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	263	7	3	549	11	7

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	270	0	822	266
Stage 1	-	-	-	-	266	-
Stage 2	-	-	-	-	555	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1294	-	344	772
Stage 1	-	-	-	-	778	-
Stage 2	-	-	-	-	575	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1294	-	343	772
Mov Cap-2 Maneuver	-	-	-	-	343	-
Stage 1	-	-	-	-	778	-
Stage 2	-	-	-	-	573	-

Approach	EB	WB	NB
HCM Control Delay, s/v	0	0.05	13.66
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	433	-	-	11	-
HCM Lane V/C Ratio	0.04	-	-	0.003	-
HCM Control Delay (s/veh)	13.7	-	-	7.8	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Intersection	
Int Delay, s/veh	0.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	3	3	35	2	2	56
Future Vol, veh/h	3	3	35	2	2	56
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
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	3	3	38	2	2	61

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	104	39	0	0	40	0
Stage 1	39	-	-	-	-	-
Stage 2	65	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	894	1032	-	-	1569	-
Stage 1	983	-	-	-	-	-
Stage 2	957	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	892	1032	-	-	1569	-
Mov Cap-2 Maneuver	892	-	-	-	-	-
Stage 1	983	-	-	-	-	-
Stage 2	956	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s/v	8.79	0	0.25
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	957	62	-
HCM Lane V/C Ratio	-	-	0.007	0.001	-
HCM Control Delay (s/veh)	-	-	8.8	7.3	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0	0	-

Intersection	
Intersection Delay, s/veh	13.6
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	234	21	45	450	2	13	4	51	0	0	0
Future Vol, veh/h	1	234	21	45	450	2	13	4	51	0	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	254	23	49	489	2	14	4	55	0	0	0
Number of Lanes	0	1	0	0	1	0	0	1	0	0	0	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	1
HCM Control Delay, s/veh	10.3	16	9
HCM LOS	B	C	A

Lane	NBLn1	EBLn1	WBLn1
Vol Left, %	19%	0%	9%
Vol Thru, %	6%	91%	91%
Vol Right, %	75%	8%	0%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	68	256	497
LT Vol	13	1	45
Through Vol	4	234	450
RT Vol	51	21	2
Lane Flow Rate	74	278	540
Geometry Grp	1	1	1
Degree of Util (X)	0.109	0.359	0.667
Departure Headway (Hd)	5.292	4.646	4.446
Convergence, Y/N	Yes	Yes	Yes
Cap	673	774	810
Service Time	3.356	2.687	2.48
HCM Lane V/C Ratio	0.11	0.359	0.667
HCM Control Delay, s/veh	9	10.3	16
HCM Lane LOS	A	B	C
HCM 95th-tile Q	0.4	1.6	5.2

Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	419	487	158	67
v/c Ratio	0.29	0.35	0.59	0.42
Control Delay (s/veh)	3.5	3.9	23.4	33.4
Queue Delay	0.0	0.0	0.0	0.0
Total Delay (s/veh)	3.5	3.9	23.4	33.4
Queue Length 50th (ft)	44	54	29	23
Queue Length 95th (ft)	102	125	84	60
Internal Link Dist (ft)	284	75	289	31
Turn Bay Length (ft)				
Base Capacity (vph)	1428	1384	542	386
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.29	0.35	0.29	0.17

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	14	371	12	34	407	22	16	34	100	19	22	23
Future Volume (veh/h)	14	371	12	34	407	22	16	34	100	19	22	23
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	0.99		0.96	0.99		0.96	0.98		0.98	0.99		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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	15	391	13	36	428	23	17	36	105	20	23	24
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	63	1314	43	106	1210	63	58	65	155	100	108	87
Arrive On Green	0.75	0.75	0.75	0.75	0.75	0.75	0.14	0.14	0.14	0.14	0.14	0.14
Sat Flow, veh/h	28	1745	57	84	1606	84	93	446	1069	332	745	601
Grp Volume(v), veh/h	419	0	0	487	0	0	158	0	0	67	0	0
Grp Sat Flow(s),veh/h/ln	1829	0	0	1774	0	0	1609	0	0	1678	0	0
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	0.0	2.4	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	6.5	0.0	0.0	7.9	0.0	0.0	8.3	0.0	0.0	3.1	0.0	0.0
Prop In Lane	0.04		0.03	0.07		0.05	0.11		0.66	0.30		0.36
Lane Grp Cap(c), veh/h	1419	0	0	1379	0	0	277	0	0	295	0	0
V/C Ratio(X)	0.30	0.00	0.00	0.35	0.00	0.00	0.57	0.00	0.00	0.23	0.00	0.00
Avail Cap(c_a), veh/h	1419	0	0	1379	0	0	512	0	0	521	0	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	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	3.5	0.0	0.0	3.7	0.0	0.0	36.4	0.0	0.0	34.3	0.0	0.0
Incr Delay (d2), s/veh	0.5	0.0	0.0	0.7	0.0	0.0	1.9	0.0	0.0	0.4	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	2.1	0.0	0.0	2.6	0.0	0.0	3.4	0.0	0.0	1.3	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	4.1	0.0	0.0	4.4	0.0	0.0	38.3	0.0	0.0	34.6	0.0	0.0
LnGrp LOS	A			A			D			C		
Approach Vol, veh/h		419			487			158			67	
Approach Delay, s/veh		4.1			4.4			38.3			34.6	
Approach LOS		A			A			D			C	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		72.4		17.6		72.4		17.6				
Change Period (Y+Rc), s		4.6		4.6		4.6		4.6				
Max Green Setting (Gmax), s		54.4		26.4		54.4		26.4				
Max Q Clear Time (g_c+I1), s		8.5		5.1		9.9		10.3				
Green Ext Time (p_c), s		2.0		0.3		2.5		0.8				
Intersection Summary												
HCM 7th Control Delay, s/veh			10.8									
HCM 7th LOS			B									

Intersection												
Int Delay, s/veh	0.2											

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	4	492	0	3	458	6	0	1	1	0	0	7
Future Vol, veh/h	4	492	0	3	458	6	0	1	1	0	0	7
Conflicting Peds, #/hr	9	0	38	38	0	9	1	0	1	1	0	1
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
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	4	523	0	3	487	6	0	1	1	0	0	7

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	503	0	0	561	0	0	1065	1079	562	1039	1076	500
Stage 1	-	-	-	-	-	-	570	570	-	506	506	-
Stage 2	-	-	-	-	-	-	495	509	-	533	570	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
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	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1062	-	-	1010	-	-	201	218	526	209	219	570
Stage 1	-	-	-	-	-	-	506	505	-	549	540	-
Stage 2	-	-	-	-	-	-	557	538	-	530	505	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1053	-	-	973	-	-	189	207	507	203	207	565
Mov Cap-2 Maneuver	-	-	-	-	-	-	189	207	-	203	207	-
Stage 1	-	-	-	-	-	-	485	484	-	542	533	-
Stage 2	-	-	-	-	-	-	546	531	-	524	484	-

Approach	EB	WB	NB	SB
HCM Control Delay, s/v	0.07	0.06	17.36	11.46
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	293	15	-	-	12	-	-	565
HCM Lane V/C Ratio	0.007	0.004	-	-	0.003	-	-	0.013
HCM Control Delay (s/veh)	17.4	8.4	0	-	8.7	0	-	11.5
HCM Lane LOS	C	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0	0	-	-	0	-	-	0

Intersection	
Int Delay, s/veh	0.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	274	10	8	490	8	6
Future Vol, veh/h	274	10	8	490	8	6
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	298	11	9	533	9	7

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	309	0	853	303
Stage 1	-	-	-	-	303	-
Stage 2	-	-	-	-	550	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1252	-	329	736
Stage 1	-	-	-	-	749	-
Stage 2	-	-	-	-	578	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1252	-	326	736
Mov Cap-2 Maneuver	-	-	-	-	326	-
Stage 1	-	-	-	-	749	-
Stage 2	-	-	-	-	572	-

Approach	EB	WB	NB
HCM Control Delay, s/v	0	0.13	13.71
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	428	-	-	29	-
HCM Lane V/C Ratio	0.036	-	-	0.007	-
HCM Control Delay (s/veh)	13.7	-	-	7.9	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Intersection	
Int Delay, s/veh	0.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	2	1	67	3	3	65
Future Vol, veh/h	2	1	67	3	3	65
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
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	2	1	73	3	3	71

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	152	74	0	0	76	0
Stage 1	74	-	-	-	-	-
Stage 2	77	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	840	987	-	-	1523	-
Stage 1	948	-	-	-	-	-
Stage 2	946	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	838	987	-	-	1523	-
Mov Cap-2 Maneuver	838	-	-	-	-	-
Stage 1	948	-	-	-	-	-
Stage 2	944	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s/v	9.09	0	0.33
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	883	79	-
HCM Lane V/C Ratio	-	-	0.004	0.002	-
HCM Control Delay (s/veh)	-	-	9.1	7.4	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0	0	-

1230 Fifth Avenue Residential Project
NOISE AND VIBRATION ASSESSMENT
San Rafael, California

October 29, 2024
Updated November 7, 2025

♦ ♦ ♦

Prepared for:

Monahan Pacific Corp.
1101 Fifth Avenue, Suite #300
San Rafael, CA 94901

Prepared by:

Fred M. Svinth, INCE, Assoc. AIA
ILLINGWORTH & RODKIN, INC.
Acoustics • Air Quality
429 East Cotati Avenue
Cotati, CA 94931
(707) 794-0400

Job No.: 23-108

INTRODUCTION AND SUMMARY

This report presents the results of an environmental noise assessment completed for the proposed 13 story 188 dwelling unit residential project 1230 5th Avenue in San Rafael, California (see Figure 1). The purpose for this noise assessment is to evaluate the compatibility of the development with respect to the environmental noise levels at the project site and evaluate noise impacts upon sensitive receptors in the area. The Setting Section of this report presents the fundamentals of environmental noise and vibration, describes regulatory criteria that are applicable in the project's assessment, and summarizes the results of a survey of the existing noise environment at the project site and vicinity.

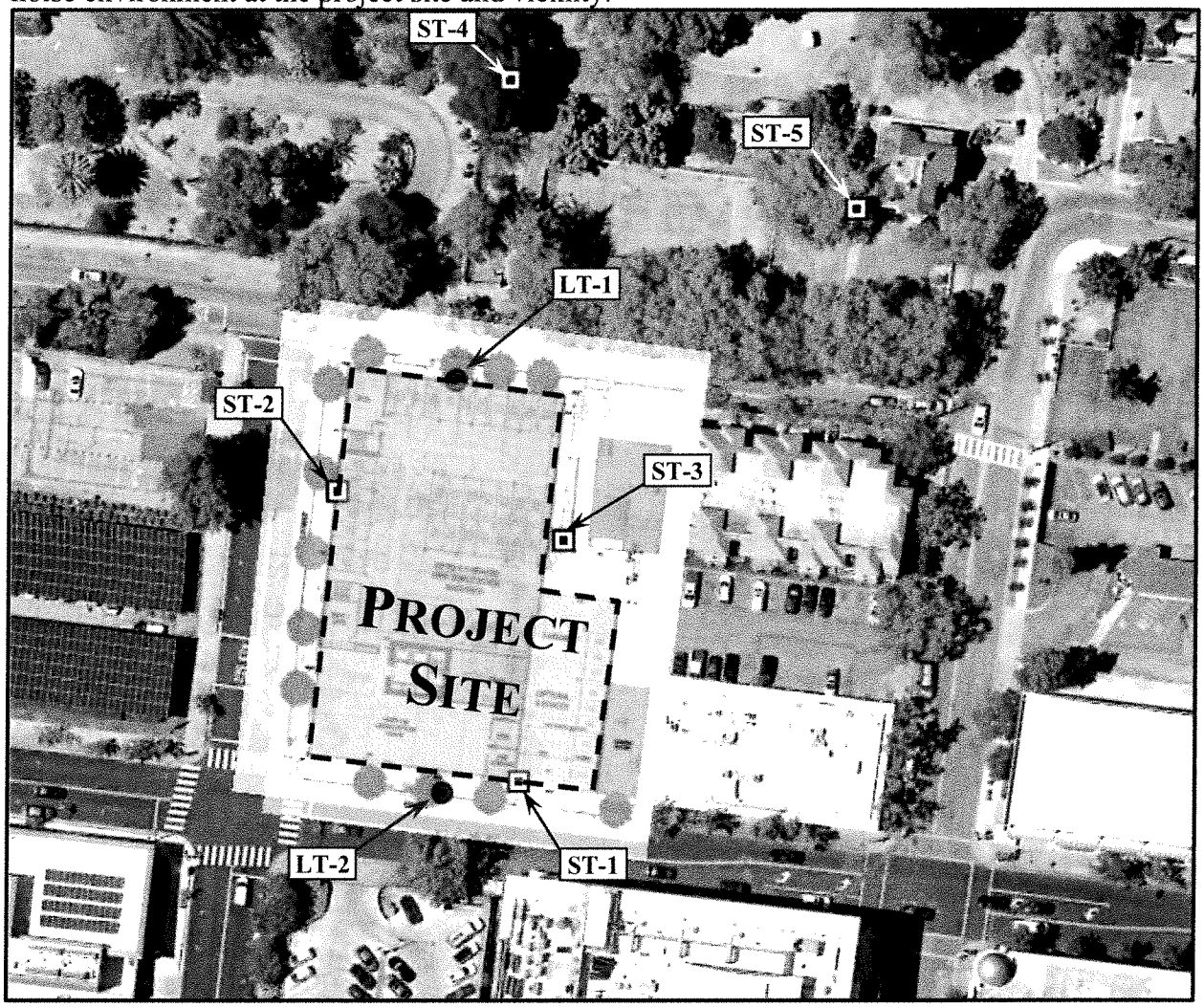

Figure 1: Project Site, Vicinity and Measurement Locations

SETTING

FUNDAMENTALS OF ENVIRONMENTAL NOISE

Noise may be defined as unwanted sound. Noise is usually objectionable because it is disturbing or annoying. The objectionable nature of sound could be caused by its *pitch* or its loudness. *Pitch* is the height or depth of a tone or sound, depending on the relative rapidity (frequency) of the vibrations by which it is produced. Higher pitched signals sound louder to humans than sounds with a lower pitch. *Loudness* is intensity of sound waves combined with the reception characteristics of the ear. Intensity may be compared with the height of an ocean wave in that it is a measure of the amplitude of the sound wave.

In addition to the concepts of pitch and loudness, there are several noise measurement scales, which are used to describe noise in a particular location. *A decibel (dB)* is a unit of measurement, which indicates the relative amplitude of a sound. The zero on the decibel scale is based on the lowest sound level that the healthy, unimpaired human ear can detect. Sound levels in decibels are calculated on a logarithmic basis. An increase of 10 decibels represents a ten-fold increase in acoustic energy, while 20 decibels is 100 times more intense, 30 decibels is 1,000 times more intense, etc. There is a relationship between the subjective noisiness or loudness of a sound and its intensity. Each 10-decibel increase in sound level is perceived as approximately a doubling of loudness over a wide range of intensities. Technical terms are defined in Table 1.

There are several methods of characterizing sound. The most common in California is the *A-weighted sound level (dBA).* This scale gives greater weight to the frequencies of sound to which the human ear is most sensitive. Representative outdoor and indoor noise levels in units of dBA are shown in Table 2. Because sound levels can vary markedly over a short period of time, a method for describing either the average character of the sound or the statistical behavior of the variations must be utilized. Most commonly, environmental sounds are described in terms of an average level that has the same acoustical energy as the summation of all the time-varying events. This *energy-equivalent sound/noise descriptor* is called L_{eq}. The most common averaging period is hourly, but L_{eq} can describe any series of noise events of arbitrary duration.

The scientific instrument used to measure noise is the sound level meter. Sound level meters can accurately measure environmental noise levels to within about plus or minus 1 dBA. Various computer models are used to predict environmental noise levels from sources, such as roadways and airports. The accuracy of the predicted models depends upon the distance the receptor is from the noise source. Close to the noise source, the models are accurate to within about plus or minus 1 to 2 dBA.

Since the sensitivity to noise increases during the evening and at night -- because excessive noise interferes with the ability to sleep -- 24-hour descriptors have been developed that incorporate artificial noise penalties added to quiet-time noise events. The *Community Noise Equivalent Level* (*CNEL*) is a measure of the cumulative noise exposure in a community, with a 5 dB penalty added to evening (7:00 pm - 10:00 pm) and a 10 dB addition to nocturnal (10:00 pm - 7:00 am) noise levels. The *Day/Night Average Sound Level* (*DNL* or L_{dn}) is essentially the same as CNEL, with the exception that the evening time period is dropped and all occurrences during this three-hour period are grouped into the daytime period.

EFFECTS OF NOISE

Sleep and Speech Interference. The thresholds for speech interference indoors are about 45 dBA if the noise is steady and above 55 dBA if the noise is fluctuating. Outdoors the thresholds are about 15 dBA higher. Steady noises of sufficient intensity (above 35 dBA) and fluctuating noise levels above about 45 dBA have been shown to affect sleep. Interior residential standards for multi-family dwellings are set by the State of California at 45 dBA L_{dn}. Typically, the highest steady traffic noise level during the daytime is about equal to the L_{dn} and nighttime levels are 10 dBA lower. The standard is designed for sleep and speech protection and most jurisdictions apply the same criterion for all residential uses. Typical structural attenuation is 12-17 dBA with open windows. With closed windows in good condition, the noise attenuation factor is around 20 dBA for an older structure and 25 dBA for a newer dwelling. Sleep and speech interference is therefore possible when exterior noise levels are about 57-62 dBA L_{dn} with open windows and 65-70 dBA L_{dn} if the windows are closed. Levels of 55-60 dBA are common along collector streets and secondary arterials, while 65-70 dBA is a typical value for a primary/major arterial. Levels of 75-80 dBA are normal noise levels at the first row of development outside a freeway right-of-way. To achieve an acceptable interior noise environment, bedrooms facing secondary

roadways need to be able to have their windows closed, those facing major roadways and freeways typically need special glass windows.

Table 1: Definitions of Acoustical Terms Used in this Report

Term	Definitions
Decibel, dB	A unit describing the amplitude of sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure. The reference pressure for air is 20.
Sound Pressure Level	Sound pressure is the sound force per unit area, usually expressed in micro-Pascals (or 20 micro-Newtons per square meter), where 1 Pascal is the pressure resulting from a force of 1 Newton exerted over an area of 1 square meter. The sound pressure level is expressed in decibels as 20 times the logarithm to the base 10 of the ratio between the pressures exerted by the sound to a reference sound pressure (e.g., 20 micro-Pascals). Sound pressure level is the quantity that is directly measured by a sound level meter.
Frequency, Hz	The number of complete pressure fluctuations per second above and below atmospheric pressure. Normal human hearing is between 20 Hz and 20,000 Hz. Infrasonic sound are below 20 Hz and Ultrasonic sounds are above 20,000 Hz.
A-Weighted Sound Level, dBA	The sound pressure level in decibels as measured on a sound level meter using the A-weighting filter network. The A-weighting filter de-emphasizes the very low and very high frequency components of the sound in a manner similar to the frequency response of the human ear and correlates well with subjective reactions to noise.
Equivalent Noise Level, L_{eq}	The average A-weighted noise level during the measurement period. The hourly Leq used for this report is denoted as dBA Leq[h].
Day-Night Level, L_{dn}	The equivalent noise level for a continuous 24-hour period with a 10-decibel penalty imposed during nighttime and morning hours (10:00 pm to 7:00 am).
Community Noise Exposure Level, CNEL	CNEL is the equivalent noise level for a continuous 24-hour period with a 5-decibel penalty imposed in the evening (7:00 pm to 10:00 pm) and a 10-decibel penalty imposed during nighttime and morning hours (10:00 pm to 7:00am)
L_1, L_{10}, L_{50}, L_{90}	The A-weighted noise levels that are exceeded 1%, 10%, 50%, and 90% of the time during the measurement period.
Ambient Noise Level	The composite of noise from all sources near and far. The normal or existing level of environmental noise at a given location.
Intrusive	That noise which intrudes over and above the existing ambient noise at a given location. The relative intrusiveness of a sound depends upon its amplitude, duration, frequency, and time of occurrence and tonal or informational content as well as the prevailing ambient noise level.

Source: Handbook of Acoustical Measurements and Noise Control, Harris, 1998.

Annoyance. Attitude surveys are used for measuring the annoyance felt in a community for noises intruding into homes or affecting outdoor activity areas. In these surveys, it was determined that the causes for annoyance include interference with speech, radio and television, house vibrations, and interference with sleep and rest. The L_{dn} as a measure of noise has been found to provide a valid correlation of noise level and the percentage of people annoyed. People have been asked to judge the annoyance caused by aircraft noise and ground transportation noise. There continues to be disagreement about the relative annoyance of these different sources. When measuring the percentage of the population highly annoyed, the threshold for ground vehicle noise is about 50 dBA L_{dn}. At a L_{dn} of about 60 dBA, approximately 12 percent of the population is highly annoyed. When the L_{dn} increases to 70 dBA, the percentage of the population highly annoyed increases to about 25-30 percent of the population. There is,

therefore, an increase of about 2 percent per dBA between a L_{dn} of 60-70 dBA. Between a L_{dn} of 70-80 dBA, each additional decibel increases the percentage of the population highly annoyed by about 3 percent. People appear to respond more adversely to aircraft noise. When the L_{dn} is 60 dBA, approximately 30-35 percent of the population is believed to be highly annoyed. Each decibel increase to 70 dBA adds about 3 percentage points to the number of people highly annoyed. Above 70 dBA, each decibel increase results in about a 4 percent increase in the percentage of the population highly annoyed.

Table 2: Typical Noise Levels in the Environment

Common Outdoor Noise Source	Noise Level (dBA)	Common Indoor Noise Source
	110 dBA	Rock band
Jet fly-over at 1,000 feet		
	100 dBA	
Gas lawn mower at 3 feet		
	90 dBA	
Diesel truck at 50 feet at 50 mph		Food blender at 3 feet
	80 dBA	Garbage disposal at 3 feet
Noisy urban area, daytime		
Gas lawn mower, 100 feet	70 dBA	Vacuum cleaner at 10 feet
Commercial area		Normal speech at 3 feet
Heavy traffic at 300 feet	60 dBA	
		Large business office
Quiet urban daytime	50 dBA	Dishwasher in next room
Quiet urban nighttime	40 dBA	Theater, large conference room
Quiet suburban nighttime		
	30 dBA	Library
Quiet rural nighttime		Bedroom at night, concert hall (background)
	20 dBA	
		Broadcast/recording studio
	10 dBA	
	0 dBA	

Source: Technical Noise Supplement (TeNS), Caltrans, November 2009.

FUNDAMENTALS OF GROUNDBORNE VIBRATION

Ground vibration consists of rapidly fluctuating motions or waves with an average motion of zero. Several different methods are typically used to quantify vibration amplitude. One is the Peak Particle Velocity (PPV), and another is the Root Mean Square (RMS) velocity. The PPV is defined as the maximum instantaneous positive or negative peak of the vibration wave. The RMS velocity is defined as the average of the squared amplitude of the signal. The PPV and RMS vibration velocity amplitudes are used to evaluate human response to vibration. In this section, a PPV descriptor with units of mm/sec or in/sec is used to evaluate construction generated vibration for building damage and human complaints. Table 3 displays the reactions of people and the effects on buildings that continuous vibration levels produce. The annoyance levels shown in Table 3 should be interpreted with care since vibration may be found to be annoying at much lower levels than those shown, depending on the level of activity or the sensitivity of the individual. To sensitive individuals, vibrations approaching the threshold of perception can be annoying.

Table 3: Reaction of People and Damage to Buildings for Continuous Vibration Levels

Vibration Level, PPV (in/sec)	Human Reaction	Effect on Buildings
0.006 to 0.019	Threshold of perception, Possibility of intrusion	Vibration unlikely to cause damage of any type
0.08	Vibrations readily perceptible	Recommended upper level of the vibration to which ruins and ancient monuments should be subjected
0.10	Level at which continuous vibrations begin to annoy people	Virtually no risk of "architectural" damage to normal buildings
0.20	Vibrations annoying to people in buildings	Threshold at which there is a risk of "architectural" damage to normal dwellings such as plastered walls or ceilings.
0.4 to 0.6	Vibrations considered unpleasant by people subjected to continuous vibrations	Vibration at this level would cause "architectural" damage and possibly minor structural damage.

Source: Transportation Related Earthborne Vibrations (Caltrans Experiences), Technical Advisory, Vibration TAV-02-01-R9601, California Department of Transportation, February 20, 2002.

Low-level vibrations frequently cause irritating secondary vibration, such as a slight rattling of windows, doors or stacked dishes. The rattling sound can give rise to exaggerated vibration complaints, even though there is very little risk of actual structural damage. In high noise environments, which are more prevalent where groundborne vibration approaches perceptible levels, this rattling phenomenon may also be produced by loud airborne environmental noise causing induced vibration in exterior doors and windows.

Construction activities can cause vibration that varies in intensity depending on several factors. The use of pile driving and vibratory compaction equipment typically generate the highest construction related ground-borne vibration levels. Because of the impulsive nature of such activities, the use of the peak particle velocity descriptor (PPV) has been routinely used to measure and assess ground-borne vibration and almost exclusively to assess the potential of vibration to induce structural damage and the degree of annoyance for humans.

The two primary concerns with construction-induced vibration, the potential to damage a structure and the potential to interfere with the enjoyment of life are evaluated against different vibration limits. Studies have shown that the threshold of perception for average persons is in the range of 0.008 to 0.012 in/sec PPV. Human perception to vibration varies with the individual and is a function of physical setting and the type of vibration. Persons exposed to elevated

ambient vibration levels such as people in an urban environment may tolerate a higher vibration level.

Structural damage can be classified as cosmetic only, such as minor cracking of building elements, or may threaten the integrity of the building. Safe vibration limits that can be applied to assess the potential for damaging a structure vary by researcher and there is no general consensus as to what amount of vibration may pose a threat for structural damage to the building. Construction-induced vibration that can be detrimental to the building is very rare and has only been observed in instances where the structure is at a high state of disrepair and the construction activity occurs immediately adjacent to the structure.

REGULATORY BACKGROUND

Federal Agencies, the State of California and the City of San Rafael have established regulatory criteria that are applicable in this assessment. The State of California Environmental Quality Act (CEQA) Guidelines, Appendix G, are used to assess the potential significance of impacts pursuant to local General Plan policies, Zoning Code standards, or the applicable standards of other agencies. A summary of the applicable regulatory criteria is provided below.

Federal Government

The Federal Transit Administration (FTA) has identified construction noise thresholds in the *Transit Noise and Vibration Impact Assessment Manual*,[1] which limit daytime construction noise to 80 dBA L_{eq} at residential land uses.

State CEQA Guidelines.

The California Environmental Quality Act (CEQA) contains guidelines to evaluate the significance of effects of environmental noise attributable to a proposed project. Under CEQA, noise impacts would be considered significant if the project would result in:

(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,
(c) For a project located within the vicinity of a private airstrip or an airport land use plan or where such a plan has not been adopted within two miles of a public airport or public use airport, if the project would expose people residing or working in the project area to excessive noise levels.

Checklist item (c) is not applicable to this project because the project is not located within an airport land use plan, is not within two miles of an airport or in the vicinity of a private air strip.

2022 California Building Code, Title 24, Part 2.

Section 1206.4 of the current (2022) California Building Code (CBC) states that interior noise levels attributable to exterior sources shall not exceed 45 dB(A) L_{dn} or CNEL (consistent with the noise element of the local general plan) in any habitable room. Though this section does to not explicitly apply this interior limit to multifamily residential buildings, per the scope discussion in Section 1206.1 and in keeping with the requirements of prior editions of the CBC this limit is applied to any habitable room for new attached (e.g. multifamily) dwellings, and not detached single-family dwellings.

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[1] Federal Transit Administration, *Transit Noise and Vibration Impact Assessment Manual*, FTA Report No. 0123, September 2018.

City of San Rafael General Plan (adopted 8.02.2021)

The Noise Element of the City of San Rafael's General Plan provides the following Goals, Policies, and Programs which are relevant to the proposed project:

GOAL N-1: Acceptable Noise Levels

Protect the public from excessive unnecessary, and unreasonable noise.

Excessive noise is a concern for many residents of San Rafael. This concern can be addressed through the implementation of standards to protect public health and reduce noise conflicts in the community, including the Noise Ordinance.

Policy N-1.1: Land Use Compatibility Standards for Noise

Protect people from excessive noise by applying noise standards in land use decisions. The Land Use Compatibility standards in Table 9-2 are adopted by reference as part of this General Plan and shall be applied in the determination of appropriate land uses in different ambient noise environments.

Program N-1.1A: Residential Noise Standards. *Maintain a maximum noise standard of 70 dBA L_{dn} for backyards, decks, and common/usable outdoor spaces in residential and mixed-use areas. As required by Title 24 insulation requirements, interior noise levels shall not exceed 45 dBA L_{dn} in all habitable rooms in residential units.*

Policy N-1.2: Maintaining Acceptable Noise Levels

Use the following performance standards to maintain an acceptable noise environment in San Rafael:

(a) New development shall not increase noise levels by more than 3 dBA L_{dn} in a residential area, or by more than 5 dBA L_{dn} in a non-residential area.

(b) New development shall not cause noise levels to increase above the "normally acceptable" levels shown in Table 9-2.

(c) For larger projects, the noise levels in (a) and (b) should include any noise that would be generated by additional traffic associated with the new development.

(d) Projects that exceed the thresholds above may be permitted if an acoustical study determines that there are mitigating circumstances (such as higher existing noise levels) and nearby uses will not be adversely affected.

Program N-1.2A: Acoustical Study Requirements. *Require acoustical studies for new single family residential projects within the projected 60 dBA L_{dn} noise contour and for multi-family or mixed-use projects within the projected 65 dBA L_{dn} contour. The studies should include projected noise from additional traffic, noise associated with the project itself, and cumulative noise resulting from other approved projects. Mitigation measures should be identified to ensure that noise levels remain at acceptable levels.*

Program N-1.2B: Approval Conditions. *Establish conditions of approval for activities with the potential to create significant noise conflicts and enforce these conditions once projects become operational.*

Table 9-2: Noise Compatibility Guidelines for San Rafael[1]

Land Uses	Interior CNEL or L_{dn} (dBA)	Exterior Noise Exposure, CNEL or L_{dn} (dBA)						
		55	60	65	70	75	80	
Residential-Low Density Single-Family, Duplex, Mobile Homes	45*							
Residential-Multiple Family	45*							
Transient Lodging, Motels, Hotels	45*							
Schools, Libraries, Churches, Hospitals, Nursing Homes	45*							
Auditoriums, Concert Halls, Amphitheaters	--							
Sports Arena, Outdoor Spectator Sports	--							
Playgrounds, Neighborhood Parks	--							
Golf Courses, Riding Stables, Water Recreation, Cemeteries	--							
Office Buildings, Businesses, Commercial and Professional	50							
Industrial, Manufacturing, Utilities, Agricultural	--							

Normally Acceptable:
Specified land use is satisfactory based upon the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements.

Conditionally Acceptable:
New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and the needed noise insulation features are included in the design. Conventional construction, but with closed windows and fresh air supply systems or air conditioning will normally suffice.

Normally Unacceptable:
New construction or development should generally be discouraged. If new construction does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design.

Clearly Unacceptable:
New construction or development generally should not be undertaken.

Policy N-1.3: Reducing Noise Through Planning and Design
Use a range of design, construction, site planning, and operational measures to reduce potential noise impacts.

Program N-1.3A: Site Planning. *Where appropriate, require site planning methods that minimize potential noise impacts. By taking advantage of terrain and site dimensions, it may be possible to arrange buildings, parking, and other uses to reduce and possibly eliminate noise conflicts. Site planning techniques include:*

(a) Maximizing the distance between potential noise sources and the receiver.
(b) Placing non-sensitive uses such as parking lots, maintenance facilities, and utility areas between the source and receiver.
(c) Using non-sensitive uses such as garages to shield noise sensitive areas.
(d) Orienting buildings to shield outdoor spaces from noise sources.
(e) Incorporating landscaping and berms to absorb sound.

Program N-1.3B: Architectural Design. *Where appropriate, reduce the potential for noise conflicts through the location of noise-sensitive spaces. Bedrooms, for example, should be placed away from freeways. Mechanical and motorized equipment (such as air conditioning units) should be located away from noise-sensitive rooms. Interior courtyards with water features can mask ambient noise and provide more comfortable outdoor spaces.*

Program N-1.3C: Noise Barriers. *Where appropriate, use absorptive noise barriers to reduce noise levels from ground transportation and industrial noise sources. A barrier should provide at least Ldn 5 dB of noise reduction to achieve a noticeable change in noise levels.*

Program N-1.3D: Noise Reduction through Construction Materials. *Where appropriate, reduce noise in interior spaces through insulation and the choice of materials for walls, roofs, ceilings, doors, windows, and other construction materials.*

Policy N-1.4: Sound Walls
Discourage the use of sound walls when other effective noise reduction measures are available. Vegetation, berms, and the mitigation measures in Policy N-3 are the preferred methods of absorbing sound along roads, rail, and other transportation features. Where there are no other feasible options (for example, along many sections of US Highway 101), the City will review and comment on sound wall design. Sound walls should be aesthetically pleasing, regularly maintained, and designed to minimize the potential displacement of sound.

Policy N-1.5: Mixed Use
Mitigate the potential for noise-related conflicts in mixed use development combining residential and non-residential uses.

Program N-1.5A: Disclosure Agreements. *Where appropriate, require disclosure agreements for residents in mixed use projects advising of potential noise impacts from nearby commercial enterprises, such as restaurants and entertainment venues.*

Policy N-1.9: Maintaining Peace and Quiet
Minimize noise conflicts resulting from everyday activities such as construction, sirens, yard equipment, business operations, night-time sporting events, and domestic activities.

Program N-1.9A: Noise Ordinance. *Maintain and enforce the noise ordinance, which addresses common noise sources such as amplified music, mechanical equipment use, and construction. Updates to the ordinance should be periodically considered in response to new issues (for example, allowing portable generators during power outages).*

Program N-1.9B: Construction Noise. *Establish a list of construction best management practices (BMPs) for future projects and incorporate the list into San Rafael Municipal Code Chapter 8.13 (Noise) The City Building Division shall verify that appropriate BMPs are included on demolition, grading, and construction plans prior to the issuance of associated permits.*

Program N-1.9C: Noise Specifications. *Include noise specifications in requests for equipment information and bids for new City equipment and consider this information as part of evaluation of the bids.*

Policy N-1.11: Vibration

Ensure that the potential for vibration is addressed when transportation, construction, and non-residential projects are proposed, and that measures are taken to mitigate potential impacts.

Program N-1.11A: Vibration-Related Conditions of Approval. *Adopt Standard conditions of approval in San Rafael Municipal Code Chapter 8.13 (Noise) that apply Federal Transit Administration (FTA) criteria for acceptable levels of groundborne vibration for various building types. These conditions should:*

(a) reduce the potential for vibration-related construction impacts for development projects near sensitive uses such as housing, schools, and historically significant buildings.

(b) *reduce the potential for operational impacts on existing or potential future sensitive uses such as uses with vibration-sensitive equipment (e.g., microscopes in hospitals and research facilities) or residences.*

Vibration impacts shall be considered as part of project level environmental evaluation and approval for individual future projects. If vibration levels exceed FTA limits, conditions of approval shall identify construction and operational alternatives that mitigate impacts.

City of San Rafael Municipal Code.

The City's Municipal Code contains a Noise Ordinance that limits sound levels at adjacent properties. Section 8.13.040 states the allowable sound pressure level at various land uses during the day and night for intermittent and constant noise. The general noise limits are given in Table 8.13-1.

TABLE 8.13-1—GENERAL NOISE LIMITS

Property type or zone	Daytime limits	Nighttime limits
Residential	60 dBA Intermittent	50 dBA Intermittent
	50 dBA Constant	40 dBA Constant
Mixed-use	65 dBA Intermittent	55 dBA Intermittent
	55 dBA Constant	45 dBA Constant
Multifamily residential (interior sound source)	40 dBA Intermittent	35 dBA Intermittent
	35 dBA Constant	30 dBA Constant
Commercial	65 dBA Intermittent	65 dBA Intermittent
	55 dBA Constant	55 dBA Constant
Industrial	70 dBA Intermittent	70 dBA Intermittent
	60 dBA Constant	60 dBA Constant
Public Property	Most restrictive noise limit applicable to adjoining private property	Most restrictive noise limit applicable to adjoining private property

Section 8.13.050 of the Municipal Code establishes allowable hours of construction between 7 a.m. and 6 p.m. Monday through Friday and between 9 a.m. and 6 p.m. on Saturdays, unless permission is granted with a development permit or other approval from planning commission, or the activity belongs to one of the exceptions stated in Subsection B of Section 3.13.050

(Standard Exceptions to general noise limits) of the City of San Rafael's Municipal Code. No construction activities are permitted on Sundays and holidays. Additionally, noise levels at any point outside of the property plane of the project are limited to a maximum (L_{max}) level of 90 dBA.

EXISTING NOISE ENVIRONMENT

The proposed project is located on the eastern side of C Street between 5th Avenue and Mission Avenue in San Rafael and is bordered by a commercial building and multifamily residences at the block interior (to the east), the Marin History Museum and an Elks Lodge to the north opposite Mission St., Fire and Police Department parking areas to the west opposite C street, and a public parking lot and a hotel to the south opposite 5th Avenue. The existing noise environment on the project site results primarily from vehicular traffic on 5th Avenue, Mission Avenue and C Street, along with mechanical equipment noise from commercial uses opposite 5th Avenue and more distant noise from area roadways and business also contributing to background sound levels.

Noise monitoring surveys were conducted on the site and surrounding areas between 10 am on Tuesday July 25th, 2023, and 9am on Friday July 28th, 2023, to quantify the existing noise environment on and around the project site. The noise monitoring survey included two long-term (LT-1 and LT-2) and five short term (ST-1 to ST-5) noise measurements as shown in Figure 1. The noise measurements were conducted with Larson Davis Laboratories (LDL) Type I Model LXT Sound Level Meters. All meters were equipped with ½-inch pre-polarized condenser microphones and windscreens and were calibrated with a Larson Davis Model CA250 precision acoustic calibrator prior to and following the measurement survey.

Long-term noise measurement, LT-1 was made on light standard on the north side of 5th Avenue at a height of 12 feet above grade and approximately 20 feet from the centerline of the roadway in front of the proposed building setback and opposite the AC Marriot hotel and parking lot on the south side of the roadway (see Figure 1). The measured noise levels at this location, including the energy equivalent noise level (L_{eq}), maximum (L_{max}), minimum (L_{min}), and the noise levels exceeded 10, 50 and 90 percent of the time (indicated as L_{10}, L_{50} and L_{90}) are shown on Chart 1, following.

A review of Chart 1 indicates that the noise levels at site LT-1 followed a diurnal pattern characteristic of traffic noise, with the typical nighttime noise level reduction limited by exhaust fan noise from the hotel garage opposite 5th Avenue. During the 71-hour noise measurement period, the average daytime noise levels ranged from 62 to 76 dBA L_{eq} and the average hourly nighttime noise levels ranged from 56 to 70 dBA L_{eq}. The overall average Day/Night noise Level (L_{dn}) for the monitoring period at position LT-1 was 70 dBA, with the full day [Wednesday(7/26) and Thursday7/27)] L_{dn} levels at 69 dBA.

Long-term noise measurement LT-2 was made on the trunk of a tree on the south side of Mission Avenue at a height of 12 feet above grade and approximately 25 feet from the roadway centerline at the proposed building setback (see Figure 1). Noise level at this location represent the existing noise exposure at the lower-level Mission Avenue project facades. The measured noise levels at this location, including the energy equivalent noise level (L_{eq}), maximum (L_{max}), minimum (L_{min}), and the noise levels exceeded 10, 50 and 90 percent of the time (indicated as L_{10}, L_{50} and L_{90}) are shown on Chart 2, following.

A review of Chart 2 indicates that the noise levels at site LT-2 followed a diurnal pattern characteristic of traffic noise, uninterrupted but constant mechanical noise (which was the case at LT-1). During the 71-hour noise measurement period, the average daytime noise levels ranged

from 59 to 70 dBA L_{eq} and the average hourly nighttime noise levels ranged from 47 to 63 dBA L_{eq}. The overall average Day/Night noise Level (L_{dn}) for the monitoring period at position LT-1 was 65 dBA, with the full day [Wednesday(7/26) and Thursday7/27)] L_{dn} levels also at 65 dBA..

Short-term noise measurements were made concurrently with the long-term measurements at long term positions LT-1 and LT-2 at five locations on July 25th, 2023, between 10:10 and 11:40am as follows;

- The first short term measurement (ST-1 as shown in Figure 1) was made at 30 feet from the centerline of 5th Avenue to represent the roadway noise exposure at the southern project façade,
- The second short term measurement (ST-2 as shown in Figure 1) was made at 30 feet from the centerline of C Street to represent the roadway noise exposure at the western project façade,
- The third short term measurement (ST-3 as shown in Figure 1) was made at the southwest corner of the multifamily residential structure at the block interior to represent the existing noise exposure at this project adjacent noise sensitive use,
- The fourth short term measurement (ST-4 as shown in Figure 1) was made at the Mission Avenue setback of the Elks Lodge to represent the existing noise exposure at this project adjacent noise sensitive use, and
- The fifth short term measurement (ST-5 as shown in Figure 1) was made at the Mission Avenue setback of the Marin History Museum to represent the existing noise exposure at this project adjacent noise sensitive use.

The existing L_{dn} at each of these short-term locations was estimated by correlating the short-term measurement data to the data gathered during the corresponding time period at positions LT-1 and LT-2. These measurement results and estimated L_{dn} levels are shown in Table 3.

TABLE 3 Summary of Short-Term Noise Measurement Data, dBA

Noise Measurement Location	L_{max}	$L_{(1)}$	$L_{(10)}$	$L_{(50)}$	$L_{(90)}$	L_{eq}	L_{dn}
ST-1: Southern (5th Avenue) site edge: [7/25/2023 10:10am to 10:20am]	77	74	67	61	56	64	**66**
ST-2: Western (C Street) site edge: [7/25/2023 10:30am to 10:40 am]	75	72	61	56	53	60	**61**
ST-3: Southwest corner of adjacent multifamily residential use: [7/25/2023 10:50am to 11:00 am]	68	59	57	54	52	55	**57**
ST-4: Mission Avenue setback of the Elks Lodge: [7/25/2023 11:10am to 11:20 am]	61	56	54	51	49	52	**53**
ST-5: Mission Avenue setback of the Marin History Museum: [7/25/2023 11:30am to 11:40 am]	68	64	55	52	49	54	**55**

Chart 1: LT-1 Hourly Noise Measurement Data

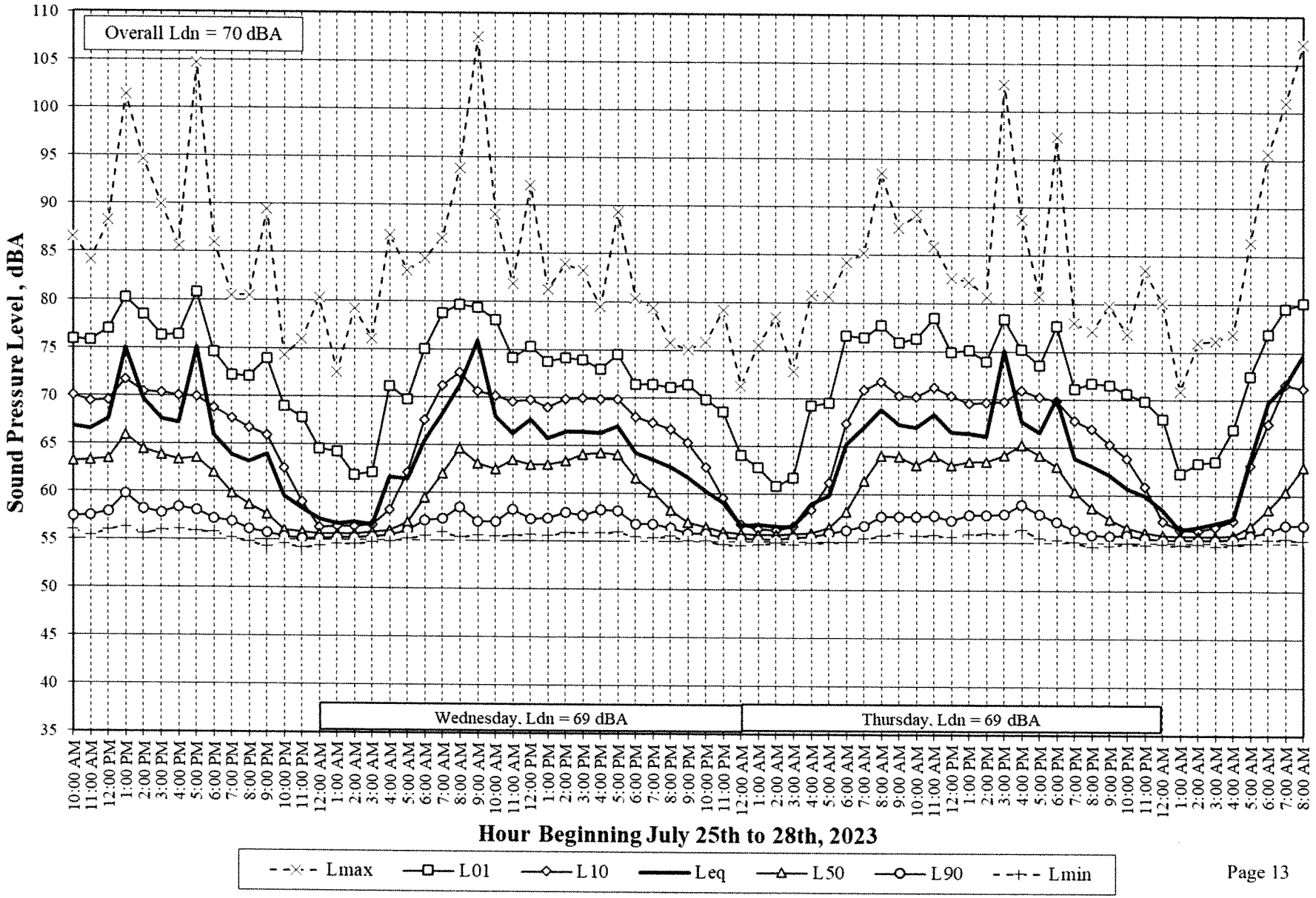
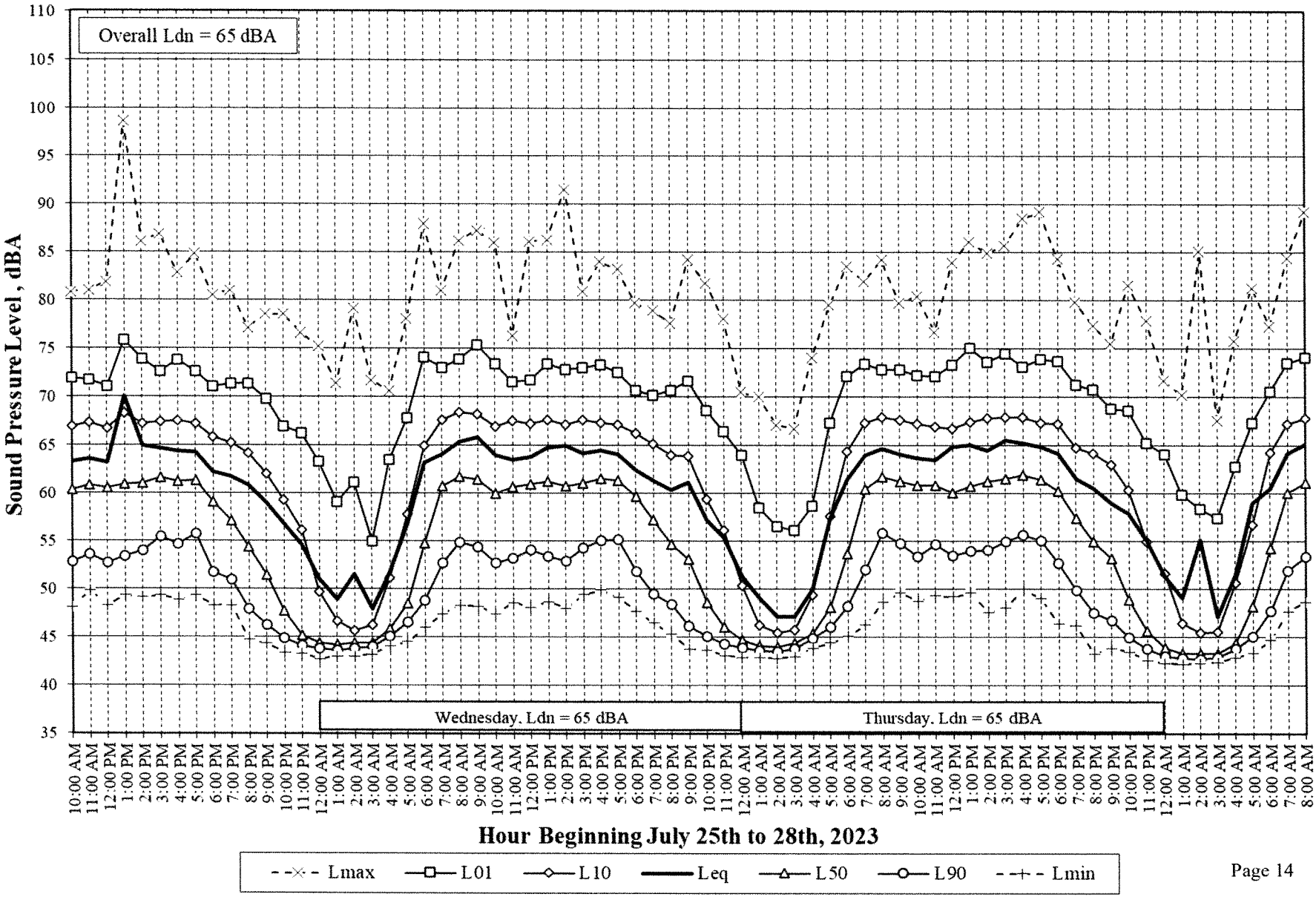


Chart 2: LT-2 Hourly Noise Measurement Data



FUTURE NOISE ENVIRONMENT

The future noise environment on the project site would continue to result primarily from traffic on the adjacent roadways, exhaust fan noise from the hotel garage to the south and more distant noise from other area roadways and business. Based on a review of information from the project traffic engineer, the project will generate 663 daily vehicle trips with a total of 33 a.m. and p.m. peak hour trips on the surrounding roadways. Considering the existing traffic on the surrounding roadways this level of traffic would likely result in a noise level increase of less than 1 dBA on the roadways serving the project[2]. Also considering that there are no available predictions of future traffic volumes on area roadways to assess the future noise environment, we have assumed a conservative 1-2% annual increase in traffic volumes along these roadways as a result of general area and regional growth over the next 10 to 15 years. With this increase in traffic, the future noise environment on the site and in the project area would be expected to increase by approximately 1 decibel over existing noise levels. Considering this we expect noise levels at the 5th Avenue project facade will be 67 dBA L_{dn}, those at the Mission Avenue project facade will be 70 dBA L_{dn}, and noise due to C Street traffic (alone) will be 58 dBA L_{dn} at the C Street facades under future conditions.

SIGNIFICANCE CRITERIA

Appendix G of the CEQA Guidelines states that a project would normally be considered to result in significant noise impacts if noise levels conflict with adopted environmental standards or plans or if noise generated by the project would substantially increase existing noise levels at sensitive receivers over a permanent or temporary basis.

A significant impact would be identified for a proposed land use if it were exposed to noise levels exceeding established guidelines or standards for noise and land use compatibility.

A substantial permanent noise increase would occur if the noise level increase resulting from the project is more than 3 dBA L_{dn} in a residential area, or more than 5 dBA L_{dn} in a non-residential area as established by the San Rafael General Plan.

A substantial temporary noise level increase due to project construction would be expected to occur if noise levels resulting from these activities exceed either,

1. The FTA daytime construction noise limits of 80 dBA L_{eq} at the nearest residential land uses, 85 dBA L_{eq} at the nearest commercial and office uses, or 90 dBA L_{eq} at the nearest industrial land uses, or
2. The City Municipal Code construction noise level limit of 90 dBA L_{max} outside of the property plane of the project.

A significant vibration impact would be identified if vibration levels generated during demolition or construction activities exceed FTA limits per the San Rafael Municipal Code.

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[2] To cause a 1 dB increase in traffic noise on area roadways, the project would need to increase traffic on these roadways by more than 25%. Given the current traffic volumes on area roadways and the projected project trip generation, this does not appear possible.

IMPACTS AND MITIGATION MEASURES

Impact 1a: **Exterior Residential Noise and Land Use Compatibility.** Residential uses developed at portions of the project site would be exposed to normally acceptable noise levels. **This is a less-than-significant impact.**

Current project drawings indicate that residential uses on the site will be on the 3rd through twelfth floors. Project plans also show that the common outdoor use areas for the project will be on the third level at the block interior and on the twelfth level at the southeastern end of the building adjacent to 5th Avenue and the block interior.

In these locations the common open spaces will receive acoustical shielding from intervening project structures. Based on a consideration of noise shielding and the results of our measurement survey and future noise projections, sound levels in the project common open space areas are expected to be well below 65 dBA L_{dn} under future conditions. Such exterior noise levels are considered "normally acceptable" for multifamily residential land uses by the City of San Rafael General Plan Noise Element.

Mitigation Measure 1a: None Required.

Impact 1b: **Interior Residential Noise and Land Use Compatibility.** The project facades along C Street, 5th Avenue, and Mission Avenue would be exposed to "conditionally acceptable" noise levels such that the interior noise levels may exceed the City and State required 45 dBA L_{dn} level. **This is a less-than-significant impact with the incorporation of noise control measures in the project design.**

Interior noise levels within residential buildings of normal construction are typically 15 dBA lower than exterior noise levels with the windows partially open. With the windows closed, standard residential construction typically provides 20 to 25 decibels of exterior to interior noise reduction. Considering this, where exterior day-night average noise levels are 65 dBA L_{dn}, or less, interior noise levels can typically be maintained below the City and State interior noise standard of 45 dBA L_{dn} with the incorporation of forced air mechanical ventilation systems to provide adequate fresh air when residents wish to keep their windows closed for noise control. Where noise levels exceed 65 dBA L_{dn}, forced-air mechanical ventilation systems and sound-rated building elements are normally required.

Based on the results of the existing noise measurement survey and the expected future noise level increases along these roadways as discussed above,

- Residential units on the Mission Avenue project façade will be exposed to exterior noise levels of between 69 dBA L_{dn} at the 4rd floor to 63 dBA at the 11th, 12th and 13th floors,
- Residential units on the 5th Avenue project façade will be exposed to exterior noise levels of between 65 dBA L_{dn} at the 4th floor to 61 dBA at the 11th , 12th and 13th floors, and
- Residential units on the C Street project façade will be exposed to exterior noise levels of between 64 to 65 dBA L_{dn} at the 4th floor to 61 to 63 dBA at the 11th, 12th and 13th floors.

Considering this, the following noise control measures are assumed to be included in the final project design:

Exterior to Interior Noise Control Design Measures:

1. All apartments facing C Street, Mission Avenue and 5th Avenue should be equipped with a mechanical ventilation system to allow residents to keep their windows closed for noise control. These apartment units are identified in the current drawings as 3rd through 11th floor units x01 to x14 and 13th floor units 1301 to 1305.

The mechanical ventilation systems in these apartments should be designed to supply adequate fresh air to the units with close windows and may include acoustically rated straight air transfer duct such as the Fresh 80, 90 or 100-dB units by Fresh Ventilation (or equal) or a standard central air conditioning and/or a central heating system with adequate fresh air supply, which is equipped with a 'summer switch' to allow the fan to circulate air without cooling or heating operation, or other systems satisfactory to the local building official.

2. Based on typical residential construction, it is expected that the windows and doors in units with a view of C Street, Mission Avenue or 5th Avenue traffic will require STC ratings of between 26 and 30, however the specific determination of sound isolation ratings of the exterior wall assemblies and window/door assemblies will be determined during the project design.

Mitigation Measure 1b: No additional measures required.

Impact 2: **Project Operational Noise Generation** Noise due to the use and occupation of the project residences on adjacent noise sensitive uses is not expected to significantly increase or alter the existing noise environment at these uses. **This is a less-than-significant impact.**

The proposed project would place new residential uses within about 20 feet of an existing multi-family residential building at the block interior and within about 50 feet of hotel rooms south of 5th Avenue. The occupation and use of the proposed residences is expected to result in the typical noises associated with residential development, including voices of the new residents, residential maintenance activities, barking dogs and children. The Heating Ventilation and Air Conditioning (HVAC) and other mechanical equipment associated with the multifamily residential development will also add noise to the existing environment. Based on a review of project drawings the HVAC equipment for the project will be installed on the roof of the proposed 12-story building. Based on noise measurements made at similar projects, individual outdoor condensing units at the proposed residences may produce constant sound pressure levels of 60 to 65 dBA L_{eq} at 1 meter (3.3 feet) and under worst-case conditions with all units operating the sound levels at the roof edge could reach 60 to 65 dBA L_{eq}. Considering this noise level and that a rooftop parapet wall and building structure itself would provide more than 10 decibels of noise reduction, and the distances to the adjacent residential uses, noise from HVAC equipment on the 12-story rooftop is expected to be below ambient noise levels at the adjacent residences and not exceed the Municipal Code noise limits.

The project also includes an emergency generator room on the second level adjacent to the C Street Garage entry facing the City of San Rafael Public Safety parking lot. Though the current project drawings do not indicate air louvers to the generator room wall at this time, they made be added in future drawings to allow for adequate airflow for the operation of the emergency generator. Though the generator has not yet been specified yet, based on the size of the project and work on other similar residential projects we would expect a $\pm$ 150 kW generator may be needed, which, also based on prior noise studies, would produce an estimated sound level of 89 dBA at 23 feet (7 meters). Using typical sound attention calculations for a fixed-point source (6 dB reduction for each distance doubling), and with standard (non-acoustical) air louvers in the generator room exterior wall sound levels would be about 79 dBA at the closest parking spot opposite C Street and about 73 dBA at the closest commercial use at the southwest corner of the 5th Avenue and C Street intersection.

While not strictly called out in the San Rafeal Noise Ordinance, the operation of an emergency generator to supply power during a power outage or other emergency in judged to be exempt from the noise ordinance limits under the provisions of Municipal Code Section 8.13.070 B

which exempts the use of "*...all necessary equipment utilized for the purpose of responding to an emergency, or necessary to restore, preserve, protect or save lives or property from imminent danger of loss or harm.*" However, the scheduled testing of the generator, which would be expected to occur for about 30 minutes on a monthly basis would not be exempt from the Noise Ordinance limits, however because this testing is really involved in the maintenance of building equipment, this type of noise source would be best placed in the intermittent construction noise category. Section 8.13.050 B of the Noise Ordinance limits sound levels from such equipment and/or activities to maximum noise level that which does not exceed ninety (90) dBA beyond the property plane of the property on which the equipment is being used between the hours of six a.m. (6:00 a.m.) and nine p.m. (9:00 p.m.), Monday through Saturday for residential properties. Considering this, testing of the Generator during the daytime hours would not exceed the City's Noise Ordinance Limit.

Additionally, though noise resulting from occupation of the new residences may noticeably change the noise environment in the adjacent residential areas, these sources would not increase noise levels in any surrounding areas by 3 dBA or more. Therefore, project operation is not judged to result in a noise impact.

Mitigation 2: None Required.

Impact 3: **Project-Generated Traffic Noise.** The proposed project would not substantially increase noise levels on a permanent basis at noise sensitive uses in the vicinity. **This is a less-than-significant impact.**

A significant impact would be identified if traffic generated by the project would substantially increase noise levels at sensitive receivers in the vicinity. A substantial increase would occur if the project traffic on area roadways resulted in a noise level increase of 5 dBA L_{dn} or greater at the multi-family residences or by 3 dBA L_{dn} or greater at single-family homes in the project area. A review of the project trip generation numbers for the development indicates that under existing conditions project traffic would result in a less than 1 dBA increase in noise levels on 5th Avenue, Mission Avenue and C Street.

Mitigation 3: None Required.

Impact 4: **Temporary Construction Noise.** Noise-sensitive land uses surrounding the project site would be exposed to a temporary increase in ambient noise levels for a period exceeding one year. Temporary noise levels during demolition and exterior building construction may exceed FTA and City Municipal Code thresholds at the nearest noise-sensitive land uses. **This is a less-than-significant impact with the incorporation of noise control measures in the project construction plan.**

The construction of the project would generate noise and would temporarily increase noise levels at adjacent residential receivers. Noise impacts resulting from construction depend on the noise generated by various pieces of construction equipment operating on site, the timing and duration of noise generating activities, and the distance between construction noise sources and noise sensitive receptors. Construction of the project is expected to take a total of 19 months and would involve demolition activities and site improvements, such as the establishment of utilities, excavation of foundations, building erection, paving, and landscaping along with multifamily residential construction. The hauling of excavated material and construction materials would generate truck trips on local roadways. The typical range of maximum instantaneous noise levels for the proposed project would be 70 to 90 dBA L_{max} at a distance of 50 feet (see Table 6) from the construction equipment.

TABLE 6: Construction Equipment 50-Foot Noise Emission Limits

Equipment Category	L_{max} Level (dBA)[1,2]	Impact/Continuous
Arc Welder	73	Continuous
Auger Drill Rig	85	Continuous
Backhoe	80	Continuous
Bar Bender	80	Continuous
Boring Jack Power Unit	80	Continuous
Chain Saw	85	Continuous
Compressor[3]	70	Continuous
Compressor (other)	80	Continuous
Concrete Mixer	85	Continuous
Concrete Pump	82	Continuous
Concrete Saw	90	Continuous
Concrete Vibrator	80	Continuous
Crane	85	Continuous
Dozer	85	Continuous
Excavator	85	Continuous
Front End Loader	80	Continuous
Generator	82	Continuous
Generator (25 KVA or less)	70	Continuous
Gradall	85	Continuous
Grader	85	Continuous
Grinder Saw	85	Continuous
Horizontal Boring Hydro Jack	80	Continuous
Hydra Break Ram	90	Impact
Impact Pile Driver	105	Impact
Insitu Soil Sampling Rig	84	Continuous
Jackhammer	85	Impact
Mounted Impact Hammer (hoe ram)	90	Impact
Paver	85	Continuous
Pneumatic Tools	85	Continuous
Pumps	77	Continuous
Rock Drill	85	Continuous
Scraper	85	Continuous
Slurry Trenching Machine	82	Continuous
Soil Mix Drill Rig	80	Continuous
Street Sweeper	80	Continuous
Tractor	84	Continuous
Truck (dump, delivery)	84	Continuous
Vacuum Excavator Truck (vac-truck)	85	Continuous
Vibratory Compactor	80	Continuous
Vibratory Pile Driver	95	Continuous
All other equipment with engines larger than 5 HP	85	Continuous

Notes:

[1] Measured at 50 feet from the construction equipment, with a "slow" (1 sec.) time constant.

[2] Noise limits apply to total noise emitted from equipment and associated components operating at full power while engaged in its intended operation.

[3]Portable Air Compressor rated at 75 cfm or greater and that operates at greater than 50 psi.

Construction activities are typically carried out in stages. During each stage of construction, there would be a different mix of equipment operating. Construction noise levels would vary by stage and vary within stages based on the amount of equipment in operation and location where

the equipment is operating. Table 7 shows the hourly average noise level ranges, by construction phase, typical for various types of projects. Hourly average noise levels generated by construction typically range from 75 to 89 dBA L_{eq} for apartment buildings as measured at a distance of 50 feet from the center of the construction site. Construction-generated noise levels drop off at a rate of about 6 dBA per doubling of the distance between the source and receptor. Shielding by buildings or terrain often results in lower construction noise levels at distant receptors.

TABLE 7: Typical Ranges of L_{eq} Construction Noise Levels at 50 Feet, dBA

Construction Stage	Domestic Housing		Office Building, Apartments, Hotel, Hospital, Public Works		Public Works Roads & Highways, Sewers, and Trenches	
	I	II	I	II	I	II
Ground Clearing	83	83	84	84	84	84
Excavation	88	75	89	79	88	78
Foundations	81	81	78	78	88	88
Erection	81	65	87	75	79	78
Finishing	88	72	89	75	84	84
I - All pertinent equipment present at site, **II** - Minimum required equipment present at site.						

Source: U.S.E.P.A., Legal Compilation on Noise, Vol. 1, p. 2-104, 1973.

The Federal Highway Administration's (FHWA's) Roadway Construction Noise Model (RCNM) was used to calculate the project specific hourly average noise levels for each phase of construction for this project. The RCNM construction noise model includes representative sound levels for the most common types of construction equipment and the approximate usage factors of such equipment that were developed based on an extensive database of information gathered during the construction of the Central Artery/Tunnel Project in Boston, Massachusetts (CA/T Project or "Big Dig"). The usage factors represent the percentage of time that the equipment would be operating at full power.

The nearest noise sensitive (residential) use to project construction is the apartment building east of the project site along Mission Avenue. The closest of these apartments will be about 20 feet from the perimeter of the construction site and about 75 feet from the geometric center of the construction site. The next closest noise sensitive use in the project vicinity is the AC Hotel southeast of the site opposite 5th Avenue, which is about 50 feet from the perimeter of the construction site and about 160 feet from the geometric center of construction site.

To assess construction noise impacts at these nearest noise sensitive receptors, the worst-case hourly average (L_{eq}) noise levels were calculated with the RCNM model using the FTA recommended general assessment method by assuming all pieces of equipment per phase are operating concurrently and propagating these combined noise emissions from the geometric center of the construction site to the nearest facades of the site adjacent noise sensitive uses land uses. In addition, the RCNM model was used to calculate maximum (L_{max}) noise levels resulting from construction at the nearest noise sensitive receptors which could result when any of the expected equipment per phase are operating at the perimeter of the construction site. These noise level estimates are shown in Table 8. It should be noted that the noise levels in Table 8 do not assume reductions due to intervening buildings or existing barriers.

TABLE 8: Project Construction Noise Levels at site adjacent Sensitive Receptors

Phase of Construction	Total Number of Workdays	Estimated Construction Noise Levels			
		Apartment building on Mission Ave[1]		AC Hotel southeast of the project site[2]	
		L_{max}, dBA	L_{eq}, dBA	L_{max}, dBA	L_{eq}, dBA
Demolition	20	**97**	**84**	90	78
Site Preparation	40	87	74	79	67
Grading/Excavation	60	89	75	81	68
Trenching/Foundation	60	89	77	81	71
Building – Exterior	120	**93**	**81**	85	74
Building – Interior & Architectural Coating	160	89	78	81	72
Paving/Site Concrete	20	90	76	82	70

1. L_{max} with equipment at 20 feet (perimeter) & L_{eq} with all equipment at 75 feet (center)
2. L_{max} with equipment at 50 feet (perimeter) & L_{eq} with all equipment at 160 feet (center)

As shown in Table 8, construction noise levels are expected to exceed the FTA 80 dBA L_{eq} residential criteria and the City of San Rafeal Municipal Code criteria of 90 dBA L_{max} for up to 140 working days during the 19 month construction period during site demolition and the construction of the building exterior at the closest residential units of apartment building on Mission Avenue east of the site.

In keeping with the intent of the General Plan to **'e**stablish a list of construction best management practices' and to reduce the impact of construction noise to the adjacent residential uses to the maximum extent feasible, the following site-specific construction noise control measures and commonly adopted best practice controls along with the allowable hours of construction from Section 8.13.050 of the Municipal Code are assumed to be included in the project construction plan:

- Noise-generating construction activities, including truck traffic coming to and from the construction site for any purpose, shall be limited to between the hours of 7:00 a.m. and 6:00 p.m. on weekdays and 9:00 a.m. and 6:00 p.m. on Saturdays. No construction shall occur on Sundays or holidays.
- All construction activity shall be conducted to minimize the noise impact at the adjacent property boundaries wherever possible.
- All equipment driven by internal combustion engines shall be equipped with mufflers, which are in good condition and appropriate for the equipment.
- The construction contractor shall utilize "quiet" models of air compressors and other stationary noise sources where technology exists. Hydraulically or electrically powered equipment shall be selected, and pneumatically powered equipment will be avoided where feasible
- Prohibit unnecessary idling of internal combustion engines, by requiring that all equipment shall be turned off if not in use for more than 5 minutes.
- Where possible noisy operations shall be combined so that they occur in the same time period. The total noise level produced will not be significantly greater than the level produced if the operation were performed separately (and the noise will be of shorter duration).
- At all times during project grading and construction, stationary noise-generating equipment shall be located as far as practicable from sensitive receptors and placed so that emitted noise is directed away from residences.

- Construction noise barriers, such as mass loaded construction blankets on temporary fencing or a solid plywood construction barrier, shall be erected at the perimeter of the site shared with the adjacent apartment building on Mission Avenue prior site demolition work in such a way as to block direct noise transfer to the exposed facades of the adjacent noise sensitive uses. Barriers on the site perimeter shall have a minimum height of eight (8) feet above the surrounding grade.
- When the construction of the building structure proceeds beyond one story in height, the façades of the building on each level facing the eastern and northern site perimeter shared with the adjacent apartment building on Mission Avenue shall be framed and sheathed first to allow the building itself to act as a barrier to noise. Though work to sheath these facades may exceed FTA and City noise standards at the closest residential units of the apartment building, once this sheathing is installed it will act as noise barrier to other construction activities at that floor level[3].
- Construction staging areas shall be established at locations that will create the greatest distance between the construction related noise sources and noise-sensitive receptors near the project site during all project construction.
- Neighbors located adjacent to the construction site shall be notified of the construction schedule in writing.
- The construction contractor shall designate a "noise disturbance coordinator" who will be responsible for responding to any local complaints about construction noise. The disturbance coordinator would determine the cause of the noise complaint (e.g., starting too early, bad muffler, etc.) and institute reasonable measures as warranted to correct the problem. A telephone number for the disturbance coordinator shall be conspicuously posted at the construction site.

Implementation of the above measures would reduce construction noise levels emanating from the site, limit construction hours, and minimize disruption and annoyance to the maximum extent feasible.

Mitigation Measure 4: No additional measures required.

Impact 5: Exposure to Construction Generated Groundborne Vibration. Buildings in the vicinity of the project site may be exposed to significant groundborne vibration levels from construction activities. **This is a less-than-significant impact with the incorporation of vibration control measures in the project construction plan.**

Construction activities would include the demolition of existing buildings, site preparation work, foundation work, paving, and new building framing and finishing. The construction of the project may generate perceptible vibration when heavy equipment or impact tools (e.g., jackhammers, hoe rams) are used. Based on project information received and consideration of the subsurface site conditions, the project foundations will utilize a shoring system[4], and deep foundations needed for the project will employ drilled piers. Thus, impact or vibratory pile driving would not be used at this project.

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[3] Based on cost estimates from other project, the installation of the noise barrier blankets are expected to be economically unfeasible for the project. Also, even with noise barrier blanket use, some perimeter construction activities may still exceed the City's construction noise standards at the closest sensitive uses. Therefore, the use of noise barrier blankets at the upper-level perimeters is considered to both technically and economically infeasible to reduce construction noise to sound levels which meet the FTA and City construction noise standards.

[4] Specifics on the exact shoring system to be used will not be available until the project reaches the building permit stage.

Program N-1.11A within Policy N-1.11 of the City's General Plan references the use of FTA vibration limits to determine the impact of construction vibration on sensitive uses such as housing, schools, and historically significant buildings The FTA guidelines for construction vibration impact criteria are shown in Table 9 for various structural categories.

TABLE 9: Construction Vibration Building Damage

Vibration Level		
PPV (in/sec)	**Approx. VdB[1]**	**Building Category**
0.5	102	I. Reinforced-concrete, steel or timber (no plaster)
0.3	98	II. Engineered concrete and masonry (no plaster)
0.2	94	III. Non-engineered timber and masonry buildings
0.12	90	IV. Buildings extremely susceptible to vibration damage

[1]RMS velocity in decibels (VdB) re 1 micro-inch/second

As discussed above the closest sensitive uses to project construction are the apartment building east of the project, which will be as close as 20 feet from the perimeter of construction and the AC Hotel southeast which will be as close as 50 feet from the perimeter of construction. Both of these are modern multi-story buildings and are thus expected to be of Type I or type II construction as identified in Table 9, and would vibration levels exceeding 0.3 in/sec, PPV or more could result in vibration damage to these structures. In addition to these noise and vibration sensitive uses, there is a potentially vibration sensitive commercial structure within 5 feet of the east edge of the proposed project building on Fifth Avenue. This building appears to be a modern structure and is also expected to be of Type I or type II construction as identified in Table 9, and vibration levels exceeding 0.3 in/sec, PPV or more could result in vibration damage to this structure.

The closest building which may fall in the Type III, "Non-engineered timber and masonry building" vibration damage category of 0.2 in/sec PPV, is the Marin History Museum building opposite Mission Avenue to the northeast, and the closest building which may fall in the Type IV "extremely susceptible to vibration damage" vibration damage category of 0.12 in/sec PPV, is the Mission San Rafeal Arcangel buildings to the west. The Marin History Museum building will be as close as 175 feet from the perimeter of construction and the Mission San Rafeal Arcangel buildings will be as close as 520 feet from the perimeter of construction

Project construction activities such as foundation drilling, the use of jackhammers, rock drills and other high-power or vibratory tools, and rolling stock equipment (tracked vehicles, compactors, etc.) may generate substantial vibration in the immediate vicinity. Building framing, exterior and interior finishing, and landscaping activities are not anticipated to be sources of substantial vibration. Construction activities are expected to take 19 months, but construction vibration would not be substantial for most of this time except during vibration generating activities (as discussed above).

Table 10 presents vibration source levels for typical construction equipment at distances of 5, 20, 50, 175 and 520 feet. A review of this table indicates that construction vibration levels would be below the Type II 0.30 in/sec PPV damage criteria at 20 and 50 feet, below the Type III 0.2 in/sec PPV damage criteria at 175 feet and below the Type IV 0.12 in/sec PPV damage criteria at 520 feet. Thus, construction vibration levels at these distances would be well below the applicable FTA construction vibration damage criteria in structures at these distances.

In these areas, where vibration would not be expected to cause structural damage, vibration levels may still be perceptible. But, as with any type of construction, this would be anticipated and would not be considered significant given the intermittent and short duration of the phases that have the highest potential of producing vibration. With the use of administrative controls

such as notifying adjacent land uses of scheduled construction activities and scheduling construction activities with the highest potential to produce perceptible vibration to hours with least potential to affect nearby residences, perceptible vibration can be kept to a minimum and as such would not result in a significant impact with respect to perception.

TABLE 10: Vibration Source Levels for Construction Equipment[5]

Equipment		Commercial Bldg. to the east **PPV at 5 ft. (in/sec)**	Apartment Bldg. to the east **PPV at 20 ft. (in/sec)**	AC Hotel to Southeast **PPV at 50 ft. (in/sec)**	Marin History Museum Bldg. **PPV at 175 ft. (in/sec)**	Mission San Rafeal Arcangel **PPV at 520 ft. (in/sec)**
Clam shovel drop		**2.2**	0.28	0.07	0.011	0.002
Hydromill (slurry wall)	in soil	0.09	0.01	0.003	0.0004	0.0001
	in rock	0.19	0.02	0.01	0.0009	0.0002
Vibratory Roller		**2.3**	0.29	0.07	0.0113	0.002
Hoe Ram		**1.0**	0.12	0.03	0.0048	0.001
Large bulldozer		**1.0**	0.12	0.03	0.0048	0.001
Caisson drilling		**1.0**	0.12	0.03	0.0048	0.001
Loaded trucks		**0.85**	0.11	0.03	0.0041	0.001
Jackhammer		**0.39**	0.05	0.01	0.0019	0.0004
Small bulldozer		0.03	0.004	0.001	0.0002	0.00003

However, Table 10 also indicates that construction vibration levels due to Clam Shovel Drops or the use of Hoe Rams, Vibratory Rollers, Bulldozers, Foundation Drilling, Loaded Trucks, or Jackhammers immediately next to the commercial structure east of the proposed project building on Fifth Avenue would exceed the FTA damage criteria. In keeping with the intent of Program N-1.11A within Policy N-1.11 of the City's General Plan and to reduce the potential for vibration-related construction impacts for development projects, the following site-specific construction vibration control measures are assumed to be included in the project construction plan:

- The operation of Hoe Rams, Foundation Drilling or Jackhammers shall not be allowed within 12 feet of the structure of the commercial building east of the proposed project on Fifth Avenue, instead less vibration intensive techniques will be employed to demolish the existing parking lot pavement within 12 feet of this structure.
- The use of loaded trucks or large bulldozers shall not be allowed within 12 feet of the commercial building east of the proposed project on Fifth Avenue
- Non-vibratory compaction rollers or vibratory rollers rated at 1.5 tons or less shall be used within 20 feet of the commercial building east of the proposed project on Fifth Avenue.

Implementation of the above measures would reduce construction vibration levels at the commercial building east of the proposed project on Fifth Avenue to levels below the FTA damage criteria.

Mitigation 5: No additional measures required.

[5] Transit Noise and Vibration Impact Assessment, United States Department of Transportation, Office of Planning and Environment, Federal Transit Administration, May 2018.

1230 5TH AVENUE AIR QUALITY EMISSIONS ASSESSMENT

San Rafael, California

July 9, 2025
Revised October 31, 2025

Prepared for:

Collin Monahan
1230 5th Avenue Investors, LLC
1101 Fifth Avenue, Suite #300
San Rafael, CA 94901

Prepared by:

Jordyn Bauer
Casey Divine

ILLINGWORTH & RODKIN, INC.
Acoustics • Air Quality
429 East Cotati Avenue
Cotati, CA 94931
(707) 794-0400

I&R Project#: 23-108

Introduction

The purpose of this report is to address the potential air quality emissions associated with the proposed residential project located at 1230 5th Avenue in San Rafael, California. Air quality impacts from this project would be associated with demolition of the existing land uses and construction and operation of the new building. Air pollutant emissions associated with construction and operation of the project were estimated using appropriate computer models. The analysis was conducted following guidance provided by the Bay Area Air District (Air District).[1]

Project Description

The approximately 0.65-acre project site is comprised of an existing commercial building and an associated surface parking lot. The project proposes to demolish the existing land uses to construct a new 13-story residential building with 187 units totaling 198,893 square feet (sf) over three levels of parking totaling 60,665-sf with 169 parking spaces. The project would include a diesel-powered 250-kilowatt (kW) emergency standby generator. Construction is proposed from January 2026 to August 2027.

General Plan 2040 & Downtown Precise Plan Final Environmental Impact Report

On May 21, 2021, the City of San Rafael released their Final Environmental Impact Report (EIR) to provide an assessment of the potential environmental consequences of approving and implementing the proposed San Rafael General Plan 2040 and Downtown Precise Plan project. The EIR identifies mitigation measures and alternatives to the General Plan 2040 and Downtown Precise Plan that would avoid or reduce potentially significant impacts. The environmental analysis in the EIR assumes that the adoption and implementation of the proposed project would result in up to 4,250 new households, 4,460 new residential units, 8,910 new residents, and 4,155 new employees by 2040. The proposed project is located within the San Rafael Downtown Precise Plan area, and in order to tier off of the EIR, the project would have to conform to applicable mitigation measures.

Setting

The project is located in Marin County, which is in the San Francisco Bay Area Air Basin. Ambient air quality standards have been established at both the State and federal level. The Bay Area meets all ambient air quality standards with the exception of ground-level ozone, respirable particulate matter (PM_{10}), and fine particulate matter ($PM_{2.5}$).

Air Pollutants of Concern

High ozone concentrations in the air basin are caused by the cumulative emissions of reactive organic gases (ROG) and nitrogen oxides (NOx). These precursor pollutants react under certain meteorological conditions to form ozone. Controlling the emissions of these precursor pollutants is the focus of the Bay Area's attempts to reduce ambient ozone concentrations. The highest ozone

[1] Also known as the Bay Area Air Quality Management District (BAAQMD), *CEQA Air Quality Guidelines*. April 2023.

concentrations in the Bay Area occur in the eastern and southern inland valleys downwind of existing air pollutant sources. High ozone concentrations aggravate respiratory and cardiovascular diseases, reduce lung function, and increase coughing and chest discomfort.

Particulate matter is another problematic air pollutant in the air basin. Particulate matter is assessed and measured in terms of respirable particulate matter or particles that have a diameter of 10 micrometers or less (PM_{10}) and fine particulate matter where particles have a diameter of 2.5 micrometers or less ($PM_{2.5}$). Elevated concentrations of PM_{10} and $PM_{2.5}$ are the result of both region-wide emissions and localized emissions. High particulate matter concentrations aggravate respiratory and cardiovascular diseases, reduce lung function, increase mortality (e.g., lung cancer), and result in reduced lung function growth in children. Due to the adverse health effects caused by $PM_{2.5}$ exposure even at low concentrations, the Air District has developed health risk thresholds to address exposure to increased $PM_{2.5}$ concentrations caused by projects.[2]

Toxic Air Contaminants

TACs are a broad class of compounds known to cause morbidity or mortality, often because they cause cancer. TACs are found in ambient air, especially in urban areas, and are caused by industry, agriculture, fuel combustion, and commercial operations (e.g., dry cleaners). TACs are typically found in low concentrations, even near their source (e.g., diesel particulate matter [DPM] near a freeway). Because chronic exposure of TACs can result in adverse health effects, they are regulated at the regional, State, and federal level.

Diesel exhaust is the predominant TAC in urban air and is estimated to represent about seventy percent of the cancer risk from TACs (based on the Bay Area average).[3] According to the California Air Resources Board (CARB), diesel exhaust is a complex mixture of gases, vapors, and fine particles. This complexity makes the evaluation of health effects from diesel exhaust exposure a complex scientific issue. Some of the chemicals in diesel exhaust, such as benzene and formaldehyde, have been previously identified as TACs by the CARB, and are listed as carcinogens either under the State's Proposition 65 or under the Federal Hazardous Air Pollutants programs. Health risks from TACs are estimated using the Office of Environmental Health Hazard Assessment (OEHHA) risk assessment guidelines, which were published in February of 2015 and incorporated into the Air District's California Environmental Quality Act (CEQA) guidance.[4]

$PM_{2.5}$ emissions can include TACs. Due to the adverse health effects caused by $PM_{2.5}$ exposure even at low concentrations, the Air District developed assessing methods and health risk thresholds to address exposure to increased concentrations caused by project $PM_{2.5}$ emissions.[5]

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[2] Bay Area Air District, 2022 CEQA Air Quality Guidelines, Appendix A, p40.

[3] CARB, *Summary: Diesel Particulate Matter Health Impacts*, Web: https://ww2.arb.ca.gov/resources/summary-diesel-particulate-matter-health-impacts#footnote1_7yob8j5.

[4] OEHHA, 2015. *Air Toxics Hot Spots Program Risk Assessment Guidelines, The Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments*. Office of Environmental Health Hazard Assessment. February.

[5] Bay Area Air District, 2022 CEQA Air Quality Guidelines, Appendix A, p40.

Sensitive Receptors

There are groups of people more affected by air pollution than others. CARB has identified the following persons who are most likely to be affected by air pollution: children under 16, people over 65, athletes, and people with cardiovascular and chronic respiratory diseases. These groups are classified as sensitive receptors. Locations that may contain a high concentration of these sensitive population groups include residential areas, hospitals, daycare facilities, elder care facilities, and elementary schools. For cancer risk assessments, children are the most sensitive receptors, since they are more susceptible to cancer causing TACs. Residential locations are assumed to include infants and small children. The closest sensitive receptors to the project site are the adjacent multi-family residences located east of the project site. There are also children located at the Saint Raphael School and Preschool to the east and infants and children located at the Old Firehouse School to the west of the project site. This project would introduce new sensitive receptors (i.e., residents) to the area.

Bay Area Air District CEQA Air Quality Guidelines

In June 2010, the Air District adopted thresholds of significance to assist in the review of projects under CEQA. In 2023, the Air District revised the *CEQA Air Quality Guidelines* that include significance thresholds to assist in the evaluation of air quality impacts of projects and plans proposed within the Bay Area. The current the Air District guidelines provide recommended procedures for evaluating potential air impacts during the environmental review process consistent with CEQA requirements including thresholds of significance, mitigation measures, and background air quality information. They include assessment methodologies for criteria air pollutants, air toxics, odors, and GHG emissions, as shown in Table 1.[6] Air quality impacts and health risks are considered potentially significant if they exceed these thresholds.

The Air District recommends all projects include a "basic" set of best management practices (BMPs) to manage fugitive dust and consider impacts from dust (i.e., fugitive PM_{10} and $PM_{2.5}$) to be less than significant if BMPs are implemented (listed below). The Air District strongly encourages enhanced BMPs for construction sites near schools, residential areas, other sensitive land uses, or if air quality impacts were found to be significant.

[6] Bay Area Air District, 2023. *2022 CEQA Guidelines*. April.

Table 1. Bay Area Air District CEQA Significance Thresholds

Criteria Air Pollutant	Construction Thresholds	Operational Thresholds	
	Average Daily Emissions (lbs./day)	Average Daily Emissions (lbs./day)	Annual Average Emissions (tons/year)
ROG	54	54	10
NO_X	54	54	10
PM_{10}	82 (Exhaust)	82	15
$PM_{2.5}$	54 (Exhaust)	54	10
CO	Not Applicable	9.0 ppm (8-hour average) or 20.0 ppm (1-hour average)	
Fugitive Dust	Construction Dust Ordinance or other Best Management Practices (BMPs)*	Not Applicable	

Note: ROG = reactive organic gases, NO_X = nitrogen oxides, PM_{10} = course particulate matter or particulates with an aerodynamic diameter of 10 micrometers (μm) or less, $PM_{2.5}$ = fine particulate matter or particulates with an aerodynamic diameter of 2.5μm or less.

* The Bay Area Air District strongly recommends implementing all feasible fugitive dust management practices especially when construction projects are located near sensitive communities, including schools, residential areas, or other sensitive land uses.

Source: Bay Area Air District, 2022 CEQA Air Quality Guidelines

Bay Area Air District Rules and Regulations

Combustion equipment associated with the proposed project includes new diesel engines to power generator that would establish new sources of particulate matter and gaseous emissions. Emissions would primarily result from the testing of the emergency backup generator. Certain emission sources would be subject to Bay Area Air District Regulations and Rules. The District's rules and regulations that may apply to the project include:

- Regulation 2 – Permits
  - Rule 2-1: General Requirements
  - Rule 2-2: New Source Review
  - Rule 2-5: New Source Review of Toxic Air Contaminants
- Regulation 6 – Particulate Matter and Visible Emissions
  - Rule 6-3: Wood-Burning Devices
- Regulation 9 – Inorganic Gaseous Pollutants
  - Rule 9-1: Sulfur Dioxide
  - Rule 9-7: Nitrogen Oxides and Carbon Monoxide from Industrial, Institutional, and Commercial Boilers, Steam Generators, And Process Heaters
  - Rule 9-4: Nitrogen Oxides from Fan Type Residential Central Furnace
  - Rule 9-6: Nitrogen Oxides Emissions from Natural Gas-Fired Boilers and Water Heaters
  - Rule 9-8: Nitrogen Oxides and Carbon Monoxide from Stationary Internal Combustion Engines

Permits

Rule 2-1-301 requires that any person installing, modifying, or replacing any equipment, the use of which may reduce or control the emission of air contaminants, shall first obtain an Authority to Construct (ATC).

Rule 2-1-302 requires that written authorization from the Bay Area Air District in the form of a Permit to Operate (PTO) be secured before any such equipment is used or operated.

Rule 2-1 lists sources that are exempt from permitting.

New Source Review

Rule 2-2, New Source Review (NSR), applies to all new and modified sources or facilities that are subject to the requirements of Rule 2-1-301. The purpose of the rule is to provide for review of such sources and to provide mechanisms by which no net increase in emissions will result.

Rule 2-2-301 requires that an applicant for an ATC or PTO apply Best Available Control Technology (BACT) to any new or modified source that results in an increase in emissions and has emissions of precursor organic compounds, non-precursor organic compounds, NOx, SO_2, PM_{10}, or CO of 10.0 pounds or more per highest day. BACT will be required for NOx emissions from the diesel-fueled generator engines.

Rule 2-5 applies to new and modified sources of TAC emissions. Bay Area Air District evaluates the TAC emissions in order to evaluate potential public exposure and health risk, to mitigate potentially significant health risks resulting from these exposures, and to provide net health risk benefits by improving the level of control when existing sources are modified or replaced. Toxics BACT (or TBACT) is applied to any new or modified source of TACs where the source risk is a cancer risk greater than 1.0 in one million and/or a chronic hazard index greater than 0.20. Permits are not issued for any new or modified source that has risks or net project risks that exceed a cancer risk of 10.0 in one million or a chronic or acute hazard index of 1.0.

Stationary Diesel Airborne Toxic Control Measure

The Bay Area Air District administers the CARB's Airborne Toxic Control Measure (ACTM) for Stationary Diesel engines (section 93115, title 17 CA Code of Regulations). The project's stationary sources will be new stationary emergency stationary emergency standby diesel engines larger than 50 hp. These limits vary based on maximum engine power. All engines are limited to PM emission rates of 0.15 g/hp-hour, regardless of size. This ACTM limits engine operation 50 hours per year for routine testing and maintenance.

Offsets

Rule 2-2-302 requires that offsets be provided for a new or modified source that emits more than 10 tons per year of NOx or precursor organic compounds. It is not expected that emissions of any pollutant will exceed the offset thresholds.

Prohibitory Rules

Regulation 6 pertains to particulate matter and visible emissions. Although the engines will be fueled with diesel, they will be modern, low emission engines. Thus, the engines are expected to comply with Regulation 6.

Rule 6-3 applies to emissions from wood-burning devices. Effective November 1, 2016, no person or builder shall install a wood-burning device in a new building construction.

Rule 9-1 applies to sulfur dioxide. The engines will use ultra-low sulfur diesel fuel (less than 15 ppm sulfur) and will not be a significant source of sulfur dioxide emissions and are expected to comply with the requirements of Rule 9-1.

Rule 9-7 limits the emissions of NOx CO from industrial, institutional and commercial boilers, steam generators and process heaters. This regulation typically applies to boilers with a heat rating of 2 million British Thermal Units (BTU) per hour.

Rule 9-8 prescribes NOx and CO emission limits for stationary internal combustion engines. Since the proposed engines will be used with emergency standby generator, Regulation 9-8-110 exempts the engines from the requirements of this Rule, except for the recordkeeping requirements (9-8-530) and limitations on hours of operation for reliability-related operation (maintenance and testing). The engines will not operate more than 50 hours per year, which will satisfy the requirements of 9-8-111.

BACT for Diesel Generator Engines

Since the generator will be used exclusively for emergency use during involuntary loss of power, the BACT levels listed for IC compression engines in the Bay Area Air District BACT Guidelines would apply. These are provided for two separate size ranges of diesel engines:

> I.C. Engine – Compression Ignition >50hp and <1.000hp: Bay Area Air District applies BACT emission limits based on the ATCM for stationary emergency standby diesel engines larger than 50 brake-horsepower (BHP). NOx emission factor limit is subject to the CARB ACTM that ranges from 0.3 to 0.5 grams per horsepower hour (g/hp-hr). The PM (PM10 or PM2.5) limit is 0.02 g/hp-hr per CARB's ACTM.
>
> I.C. Engine – Compression Ignition >999hp: Bay Area Air District applies specific BACT emission limits for stationary emergency standby diesel engines equal or larger than 1,000 brake-horsepower (BHP). NOx emission factor limit is subject to the CARB ACTM that ranges from 0.5 g/hp-hr. The PM (PM10 or PM2.5) limit is 0.02 g/hp-hr. POC (i.e., ROG) limits are 0.14 g/hp-hr.

Furnaces and Boilers and Water Heaters

In 2023, the Air District adopted the proposed amendments to Rules 9-4 and 9-6 that are intended to reduce emissions of NOx from residential and commercial water heaters. These amended rules

will affect Bay Area households that use natural gas appliances by, essentially, prohibiting the installation of new natural gas-fired furnaces and water heaters. The rules require appliances that do not emit NOx. Currently, the only zero-NOx appliances available are electric appliances. Implementation begins in 2027, where only zero-NOx water heaters can be sold or installed, in 2029 where only zero-NOx furnaces can be sold or installed, and 2031 where only zero-NOx large commercial heaters can be sold or installed. Note that electric appliances would have zero emission of other criteria pollutants and zero emissions of direct GHG.

San Rafael General Plan 2040

The San Rafael General Plan 2040 includes policies to reduce exposure of the City's sensitive population to exposure of air pollution and toxic air contaminants. The following policies are applicable to the proposed project:

C-2.1 *State and Federal Air Quality Standards.* Continue to comply and strive to exceed state and federal standards for air quality for the benefit of the Bay Area.

C-2.2 *Land Use Compatibility and Building Standards.* Consider air quality conditions and the potential for adverse health impacts when making land use and development decisions. Buffering, landscaping, setback standards, filters, insulation and sealing, home HVAC measures, and similar measures should be used to minimize future health hazards.

C-2.3 *Improving Air Quality Through Land Use and Transportation Choices.* Recognize air quality benefits of reducing dependency on gasoline-powered vehicles. Implement land sue and transportation policies, supportable by objective data, to reduce the number and length of car trips, improve alternatives to driving, reduce vehicle idling, and support the shift to electric and cleaner-fuel vehicles.

C-2.4 *Particulate Matter Pollution Reduction.* Promote the reduction of particulate matter from roads, parking lots, construction sites, agricultural lands, wildfires, and other sources.

C-2.5 *Indoor Air Pollutants.* Reduce exposure to indoor air pollutants such as mold, lead, and asbestos through the application of state building standards, code enforcement activities, education, and remediation measures.

C-2.6 *Education and Outreach.* Support public education regarding air pollution prevention and mitigation.

City of San Rafael - General Plan Update and Downtown Precise Plan EIR

The City's EIR addressed air quality impacts associated with land use development in San Rafael that is consistent with the General Plan Update and Downtown Precise Plan.[7] Air quality impacts and mitigation measures in the EIR include:

Goal C-2: Clean Air. Reduce air pollution to improve environmental quality and protect public health.

Policy C-2.1: State and Federal Air Quality Standards. Continue to comply with state and federal air quality standards.

Program C-2.1A: Cooperation with Other Agencies. Work with the Bay Area Air Quality Management District (Air District) and other agencies to ensure compliance with air quality regulations and proactively address air quality issues.

Policy C-2.4: Particulate Matter Pollution Reduction. Promote the reduction of particulate matter from roads, parking lots, construction sites, agricultural lands, wildfires, and other sources.

Program C-2.4A: Particulate Matter Exposure. Through development review, require that Best Available Control Technology (BACT) measures (such as setbacks, landscaping, paving, soil and dust management, and parking lot street sweeping) are used to protect sensitive receptors from particulate matter. This should include control of construction-related dust and truck emissions as well as long-term impacts associated with project operations. Where appropriate, health risk assessments may be required to evaluate risks and determine appropriate mitigation measures.

Mitigation Measure AIR-2.1: To reduce temporary increases in criteria air pollutant emissions (NOx) during the construction phase for discretionary development projects that are subject to CEQA which exceed the screening sizes in the Bay Area Air Quality Management District (Air District) CEQA Guidelines, the City shall adopt the following General Plan Program to support Policy C-2.4 (Particulate Matter Pollution Reduction) to be implemented as part of the project approval process:

New Program: Require projects that exceed the Air District screening sizes to evaluate project-specific construction emissions in conformance with the Air District methodology and if construction-related criteria air pollutants exceed the Air District thresholds of significance, require the project applicant to mitigate the impacts to an acceptable level.

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[7] City of San Rafael. 2021. *General Plan 2040 & Downtown Precise Plan Final EIR,* See: https://storage.googleapis.com/proudcity/sanrafaelca/uploads/2021/06/FinalEIR_Combined_WithAppendix_05-21-2021-v2.pdf

Air Quality Emissions

Construction Period Emissions

The California Emissions Estimator Model (CalEEMod) Version 2022 was used to estimate emissions from on-site construction activity, construction vehicle trips, and evaporative emissions. The project land use types and size were input to CalEEMod. The CalEEMod model output along with construction inputs are included in *Attachment 1*.

CalEEMod Inputs

Land Use Inputs

The proposed project land uses were entered into CalEEMod as described in Table 2.

Table 2. Summary of Project Land Use Inputs

Project Land Uses	Size	Units	Square Feet (sf)	Acreage
Apartments High Rise	187	Dwelling Units	198,893	0.65
Unenclosed Parking with Elevator	169	Parking Space	60,665	

Construction Inputs

CalEEMod computes annual emissions for construction that are based on the project type, size, and acreage. The model provides emission estimates for both on-site and off-site construction activities. On-site activities are primarily made up of construction equipment emissions, while off-site activity includes worker, hauling, and vendor traffic. The construction build-out scenario, including equipment quantities, average hours per day, total number of workdays, and schedule, were based on information provided by the project applicant. The construction schedule assumed that the earliest start date would be January 2026 and would be built over a period of approximately 19 months or 414 construction workdays. The earliest full year of operation was assumed to be 2028.

Construction Truck Traffic Emissions

Construction would produce traffic in the form of worker trips and truck traffic. The traffic-related emissions are based on worker and vendor trip estimates produced by CalEEMod and haul trips that were computed based on the provided demolition material to be exported, the provided soil imported and/or exported to the site, and the provided amount of cement truck trips to and from the site. CalEEMod provides daily estimates of worker and vendor trips for each applicable phase. Daily haul trips for demolition and grading were estimated by CalEEMod using the provided demolition and soil volumes. The provided concrete volume was converted to daily one-way trips, assuming two trips per delivery. These values are shown in the project construction equipment worksheet included in *Attachment 1*.

Summary of Computed Construction Emissions

Average daily emissions were annualized for each year of construction by dividing the annual construction emissions by the number of active workdays during that year. Table 3 shows the unmitigated average daily construction emissions of ROG, NOx, PM_{10} exhaust, and $PM_{2.5}$ exhaust during construction of the project. As indicated in Table 3, predicted unmitigated project construction emissions would not exceed Bay Area Air District significance thresholds during construction.

Table 3. Construction Period Emissions - Unmitigated

Year	ROG	NOx	PM_{10} Exhaust	$PM_{2.5}$ Exhaust
Construction Emissions Per Year (Tons)				
2026	0.37	0.43	0.01	0.01
2027	1.12	0.12	0.003	0.003
Average Daily Construction Emissions Per Year (pounds/day)				
2026 (261 construction workdays)	2.86	3.33	0.09	0.08
2027 (153 construction workdays)	14.59	1.55	0.04	0.03
Air District Thresholds (pounds per day)	*54* lbs./day	*54* lbs./day	*82* lbs./day	*54* lbs./day
Exceed Threshold?	No	No	No	No

Construction activities, particularly during site preparation and grading, would temporarily generate fugitive dust in the form of PM_{10} and $PM_{2.5}$. Sources of fugitive dust would include disturbed soils at the construction site and trucks carrying uncovered loads of soils. Unless properly controlled, vehicles leaving the site would deposit mud on local streets, which could be an additional source of airborne dust after it dries. The Air District recommends all projects include a "basic" set of BMPs to manage fugitive dust and considers impacts from dust (i.e., fugitive PM_{10} and $PM_{2.5}$) to be less-than-significant if BMPs are implemented to reduce these emissions. The City of San Rafael General Plan Update and Downtown Precise Plan EIR Program C-2.4A would require the project to implement the Air District-recommended BMPs.

General Plan Update and Downtown Precise Plan EIR Program C-2.4A: Include Air District basic BMPs to control dust and exhaust during construction.

During any construction period ground disturbance, the applicant shall ensure that the project contractor implement measures to control dust and exhaust. Implementation of the measures recommended by the Air District and listed below would reduce the air quality impacts associated with grading and new construction to a less-than-significant level.

1. All exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) shall be watered two times per day.

2. All haul trucks transporting soil, sand, or other loose material off-site shall be covered.

3. All visible mud or dirt track-out onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweeping is prohibited.

4. All vehicle speeds on unpaved roads shall be limited to 15 miles per hour (mph).

5. All roadways, driveways, and sidewalks to be paved shall be completed as soon as possible. Building pads shall be laid as soon as possible after grading unless seeding or soil binders are used.

6. All excavation, grading, and/or demolition activities shall be suspended when average wind speeds exceed 20 mph.

7. All trucks and equipment, including their tires, shall be washed off prior to leaving the site.

8. Unpaved roads providing access to sites located 100 feet or further from a paved road shall be treated with a 6- to 12-inch layer of compacted layer of wood chips, mulch, or gravel.

9. Publicly visible signs shall be posted with the telephone number and name of the person to contact at the lead agency regarding dust complaints. This person shall respond and take corrective action within 48 hours. The Air District's General Air Pollution Complaints number shall also be visible to ensure compliance with applicable regulations.

Effectiveness of General Plan Update and Downtown Precise Plan EIR Program C-2.4A

The measures above are consistent with the General Plan Update and Downtwon Precise Plan EIR Program and Air District-recommended basic BMPs for reducing fugitive dust contained in the Air District CEQA Air Quality Guidelines. For this analysis, only the basic set of BMPs are required as the unmitigated fugitive dust emissions from construction are below the Air District single-source threshold.

Operational Period Emissions

ROG, PM, and NOx emissions from the project would be generated primarily from autos driven by future residents. Evaporative emissions from architectural coatings and maintenance products (classified as consumer products) are also typical ROG emission sources from these types of land uses. CalEEMod was used to estimate emissions from operation of the proposed project assuming full build-out.

CalEEMod Inputs

Land Uses

The project land uses were input to CalEEMod as described above for the construction period modeling.

Model Year

Emissions associated with vehicle travel depend on the year of analysis because emission control technology requirements are phased-in over time. Therefore, the earlier the year analyzed in the model, the higher the emission rates utilized by CalEEMod. The earliest year of full operation

would be 2028 if construction begins in 2026. Emissions associated with build-out later than 2028 would be lower.

Traffic Information

The CalEEMod default trip generation rates were utilized to calculate emissions from project traffic. The daily trip generation was calculated using the CalEEMod default trip generation rates and the size of the project land uses. The project would produce approximately 832 daily weekday trips. The default trip lengths and trip types specified by CalEEMod were used.

Energy

CalEEMod defaults for energy use were used which include the 2019 Title 24 Building Standards. These defaults are conservative, as the Project would need to meet the more stringent and latest Title 24 Building Standards. GHG emissions modeling includes those indirect emissions from electricity consumption. The electricity produced emission rate was modified in CalEEMod. An emission factor of 41 pounds of CO_2 per megawatt of electricity produced was entered into CalEEMod, which is based on Marin Clean Energy's (MCE) average Annual Content Power Labels for 2021-2023.[8]

Project Generator

The project would include one diesel-powered emergency generator. The generator would produce a maximum of 250 kilowatts (kW) and is assumed to be powered by a 335-horsepower (hp) diesel-fired engine. The generator would be tested periodically and power the building in the event of a power failure. For modeling purposes, it was assumed that the generator would be operated for testing and maintenance purposes as well as non-testing purposes per the Air District's newest Guidelines. CARB and the Air District requirements limit the engine operations to 50 hours each per year for testing and maintenance. During testing periods, the engine would typically run for less than one hour. The engine would be required to meet CARB and EPA emission standards and consume commercially available California low-sulfur diesel fuel. Additionally, the generator would have to meet Air District BACT requirements for IC Engine-Compression Ignition: Stationary Emergency, non-Agricultural, non-direct drive fire pump sources. These include emission limits similar to U.S. EPA Tier 4 standards for the engine between 300 and 600-HP. The emissions from operation of the generator were calculated using CalEEMod.

Wood-Burning Devices

CalEEMod default inputs assume new residential construction would include wood-burning fireplaces and stoves. The project would not include wood-burning devices, as these devices are prohibited by Air District Regulation 6, Rule 3.[9] Therefore, the number of woodstoves and fireplaces in CalEEMod were set to zero.

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[8] Annual Power Content Labels for 2023. Web: https://www.energy.ca.gov/programs-and-topics/programs/power-source-disclosure-program/power-content-label/annual-power-4

[9] Bay Area Air District, https://www.baaqmd.gov/~/media/dotgov/files/rules/regulation-6-rule-3/documents/20191120_r0603_final-pdf.pdf?la=en

Other Inputs

Default model assumptions for emissions associated with solid waste generation and water use were applied to the project. Wastewater treatment was estimated to be 100 percent aerobic conditions to represent City wastewater treatment plant conditions. The project site would not send wastewater to on-site septic tanks or facultative lagoons.

Summary of Computed Operational Emissions

Annual emissions were predicted using CalEEMod and daily emissions were estimated assuming 365 days of operation. Table 4 shows uncontrolled net average daily operational emissions of ROG, NOx, total PM_{10}, and total $PM_{2.5}$ during operation of the project. Operational period emissions would not exceed the Air District significance thresholds.

Table 4. Operational Period Emissions

Scenario	ROG	NOx	PM_{10}	$PM_{2.5}$
2028 Project Operational Emissions (with Generator) *(tons/year)*	1.49	0.39	0.63	0.17
Air District Thresholds (tons /year)	*10 tons*	*10 tons*	*15 tons*	*10 tons*
Exceed Thresholds?	No	No	No	No
2028 Daily Project Operational Emissions *(lbs./day)*[1]	8.17	2.12	3.46	0.93
Air District Thresholds (lbs./day)	*54 lbs.*	*54 lbs.*	*82 lbs.*	*54 lbs.*
Exceed Threshold?	No	No	No	No

Notes: [1] Assumes 365-day operation.

Supporting Documentation

Attachment 1 includes the CalEEMod output for project construction and operational criteria air pollutant emissions. Also included are any modeling assumptions.

Attachment 1: CalEEMod Modeling Inputs and Outputs

Air Quality/Noise Construction Information Data Request

Project Name: 1230 5th Ave, San Rafael CA

Complete ALL Portions in Yellow

See Equipment Type TAB for type, horsepower and load factor

Project Size	187 Dwelling Units	28341 total project SF disturbed	
	198893 s.f. residential		
	0 s.f. retail		
	s.f. office/commercial		
	s.f. other, specify:	Common Area	
	60665 s.f. parking garage	159 spaces	
	NA s.f. parking lot	NA spaces	
Construction Days (i.e, M-F)	Monday to	Friday	
Construction Hours	7 am to	7 pm	

Pile Driving? Y/N? No

Project include on-site GENERATOR OR FIRE PUMP during project OPERATION (not construction)? Y/N? No

IF YES (if BOTH separate values) -->

Kilowatts/Horsepower: _____

Fuel Type: _____

Location in project (Plans Desired if Available):

DO NOT MULTIPLY EQUIPMENT HOURS/DAY BY THE QUANTITY OF EQUIPMENT

Quantity	Description	HP	Load Factor	Hours/day	Total Work Days	Avg. Hours per day	HP Annual Hours	Comments
	Demolition	**Start Date:**	**1/1/2026**	**Total phase:**	**20**			**Overall Import/Export Volumes**
		End Date:	**2/1/2026**					
1	Concrete/Industrial Saws	33	0.73	7	2	0.7	337	**Demolition Volume**
1	Excavators	36	0.38	7	15	5.3	1436	Square footage of buildings to be demolished
	Rubber-Tired Dozers	367	0.4			0	0	(*or* total tons to be hauled)
1	Tractors/Loaders/Backhoes	84	0.37	7	20	7	4351	3400 square feet *or*
	Other Equipment?							7 Hauling volume (tons)
								Any pavement demolished and hauled? 13 tons
	Site Preparation	**Start Date:**	**2/1/2026**	**Total phase:**	**40**			
		End Date:	**4/1/2026**					
	Graders	148	0.41			0	0	
	Rubber Tired Dozers	367	0.4			0	0	
1	Tractors/Loaders/Backhoes	84	0.37	7	25	4.4	5439	
	Other Equipment?							
	Grading / Excavation	**Start Date:**	**2/1/2026**	**Total phase:**	**60**			
		End Date:	**5/1/2026**					**Soil Hauling Volume**
1	Excavators	36	0.38	7	30	3.5	2873	8,155
	Graders	148	0.41			0	0	Import volume = 7 cubic yards?
	Rubber Tired Dozers	367	0.4			0	0	
	Concrete/Industrial Saws	33	0.73			0	0	
1	Tractors/Loaders/Backhoes	84	0.37	7	15	1.8	3263	
	Other Equipment?							
	Trenching/Foundation	**Start Date:**	**5/1/2026**	**Total phase:**	**60**			
		End Date:	**8/1/2026**					
1	Tractor/Loader/Backhoe	84	0.37	7	20	2.3	4351	
	Excavators	36	0.38			0	0	
	Other Equipment?							
	Building - Exterior	**Start Date:**	**8/1/2026**	**Total phase:**	**120**			**Cement Trucks? 450 Total Round-Trips**
		End Date:	**2/1/2027**					
1	Cranes	367	0.29	7	120	7	89401	Electric? (Y/N) Y
1	Forklifts	82	0.2	4	30	1	1968	Liquid Propane (LPG)? (Y/N) N Otherwise Assumed diesel
	Generator Sets	14	0.74			0	0	Or tempurary line power? (Y/N) Y
	Tractors/Loaders/Backhoes	84	0.37			0	0	
1	Welders	46	0.45	4	30	1	2484	
	Other Equipment?							
	Building - Interior/Architectural Coating	**Start Date:**	**11/1/2026**	**Total phase:**	**160**			
		End Date:	**8/1/2027**					
1	Air Compressors	37	0.48	7	70	3.1	8702	
1	Aerial Lift	46	0.31	7	30	1.3	2995	
	Other Equipment?							
	Paving	**Start Date:**	**3/1/2027**	**Total phase:**	**20**			
		Start Date:	**5/1/2027**					
1	Cement and Mortar Mixers	10	0.56	7	15	5.3	588	
	Pavers	81	0.42			0	0	**Asphalt? N, 0 cubic yards or ____ round trips?**
	Paving Equipment	89	0.36			0	0	
	Rollers	36	0.38			0	0	
1	Tractors/Loaders/Backhoes	84	0.37	4	10	2	1243	
	Other Equipment?							
	Additional Phases	**Start Date:**		**Total phase:**				
		Start Date:						
						#DIV/0!	0	
						#DIV/0!	0	
						#DIV/0!	0	
						#DIV/0!	0	
						#DIV/0!	0	

Equipment types listed in "Equipment Types" worksheet tab.

Equipment listed in this sheet is to provide an example of inputs
It is assumed that water trucks would be used during grading
Add or subtract phases and equipment, as appropriate
Modify horsepower or load factor, as appropriate

Complete one sheet for each project component

Construction Criteria Air Pollutants						
Unmitigated	ROG	NOX	PM10 Exhaust	PM2.5 Exhaust	PM2.5 Fugitive	**CO2e**
Year	Tons					MT
	Construction Equipment					
2026	0.37	0.43	0.01	0.01	0.03	237.66
2027	1.12	0.12	0.003	0.003	0.01	62.48
	Total Construction Emissions					
Tons	1.49	0.55	0.01	0.01		300.15
Pounds/Workdays	*Average Daily Emissions*					Wo
2026	2.86	3.33	0.09	0.08		
2027	14.59	1.55	0.04	0.03		
Threshold - lbs/day	**54.0**	**54.0**	**82.0**	**54.0**		
	Total Construction Emissions					
Pounds	2976.87	1107.02	27.90	25.19		0.00
Average	7.19	2.67	0.07	0.06		0.00
Threshold - lbs/day	**54.0**	**54.0**	**82.0**	**54.0**		

Operational Criteria Air Pollutants				
Unmitigated	ROG	NOX	Total PM10	Total PM2.5
Year	Tons			
Total	1.49	0.39	0.63	0.17
	Net Annual Operational Emissions			
Tons/year	1.49	0.39	0.63	0.17
Threshold - Tons/year	**10.0**	**10.0**	**15.0**	**10.0**
	Average Daily Emissions			
Pounds Per Day	8.17	2.12	3.46	0.93
Threshold - lbs/day	**54.0**	**54.0**	**82.0**	**54.0**

23-108 1230 5th Avenue, San Rafael BMPs 2028 Detailed Report

able of Contents

. Basic Project Information

.1. Basic Project Information

Data Field	Value
Project Name	23-108 1230 5th Avenue, San Rafael BMPs 2028
Construction Start Date	1/1/2026
Operational Year	2028
Lead Agency	—
Land Use Scale	Project/site
Analysis Level for Defaults	County
Windspeed (m/s)	3.60
Precipitation (days)	5.60
Location	1230 Fifth Ave, San Rafael, CA 94901, USA
County	Marin
City	San Rafael
Air District	Bay Area AQMD
Air Basin	San Francisco Bay Area
TAZ	922
EDFZ	2
Electric Utility	MCE
Gas Utility	Pacific Gas & Electric
App Version	2022.1.1.30

.2. Land Use Types

Land Use Subtype	Size	Unit	Lot Acreage	Building Area (sq ft)	Landscape Area (sq ft)	Special Landscape Area (sq ft)	Population	Description
Apartments High Rise	187	Dwelling Unit	0.65	198,893	0.00	—	449	—

Unenclosed Parking with Elevator	169	Space	0.00	60,665	0.00	—	—	—

1.3. User-Selected Emission Reduction Measures by Emissions Sector

No measures selected

2. Emissions Summary

2.1. Construction Emissions Compared Against Thresholds

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Un/Mit.	ROG	NOx	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—
Unmit.	14.6	5.46	0.15	1.67	1.82	0.14	0.40	0.54	3,683
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—
Unmit.	15.4	6.31	0.17	1.94	2.10	0.15	0.47	0.62	3,935
Average Daily (Max)	—	—	—	—	—	—	—	—	—
Unmit.	6.11	2.38	0.06	0.61	0.67	0.05	0.15	0.20	1,435
Annual (Max)	—	—	—	—	—	—	—	—	—
Unmit.	1.12	0.43	0.01	0.11	0.12	0.01	0.03	0.04	238

2.2. Construction Emissions by Year, Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Year	ROG	NOx	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	CO2e
Daily - Summer (Max)	—	—	—	—	—	—	—	—	—
2026	0.95	5.46	0.15	1.67	1.82	0.14	0.40	0.54	3,683

027	14.6	1.15	0.03	0.31	0.33	0.03	0.07	0.10	516
)aily - Winter Max)	—	—	—	—	—	—	—	—	—
026	15.4	6.31	0.17	1.94	2.10	0.15	0.47	0.62	3,935
027	15.4	5.99	0.15	1.94	2.09	0.14	0.47	0.61	3,877
\verage Daily	—	—	—	—	—	—	—	—	—
026	2.04	2.38	0.06	0.61	0.67	0.05	0.15	0.20	1,435
027	6.11	0.65	0.02	0.22	0.23	0.01	0.05	0.07	377
\nnual	—	—	—	—	—	—	—	—	—
026	0.37	0.43	0.01	0.11	0.12	0.01	0.03	0.04	238
027	1.12	0.12	< 0.005	0.04	0.04	< 0.005	0.01	0.01	62.5

.4. Operations Emissions Compared Against Thresholds

riteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Jn/Mit.	ROG	NOx	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	CO2e
)aily, Summer Max)	—	—	—	—	—	—	—	—	—
Jnmit.	9.02	2.04	0.08	3.55	3.62	0.07	0.90	0.97	4,911
)aily, Winter Max)	—	—	—	—	—	—	—	—	—
Jnmit.	7.57	2.17	0.07	3.55	3.62	0.06	0.90	0.96	4,665
\verage Daily Max)	—	—	—	—	—	—	—	—	—
Jnmit.	8.17	2.12	0.07	3.39	3.46	0.07	0.86	0.93	4,583
\nnual (Max)	—	—	—	—	—	—	—	—	—
Jnmit.	1.49	0.39	0.01	0.62	0.63	0.01	0.16	0.17	759

.5. Operations Emissions by Sector, Unmitigated

riteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Sector	ROG	NOx	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—
Mobile	2.61	1.39	0.02	3.55	3.57	0.02	0.90	0.92	3,819
Area	6.38	0.12	0.01	—	0.01	0.01	—	0.01	39.4
Energy	0.03	0.53	0.04	—	0.04	0.04	—	0.04	765
Water	—	—	—	—	—	—	—	—	25.3
Waste	—	—	—	—	—	—	—	—	261
Refrig.	—	—	—	—	—	—	—	—	1.42
Stationary	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	9.02	2.04	0.08	3.55	3.62	0.07	0.90	0.97	4,911
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—
Mobile	2.51	1.64	0.02	3.55	3.57	0.02	0.90	0.92	3,612
Area	5.02	0.00	0.00	—	0.00	0.00	—	0.00	0.00
Energy	0.03	0.53	0.04	—	0.04	0.04	—	0.04	765
Water	—	—	—	—	—	—	—	—	25.3
Waste	—	—	—	—	—	—	—	—	261
Refrig.	—	—	—	—	—	—	—	—	1.42
Stationary	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	7.57	2.17	0.07	3.55	3.62	0.06	0.90	0.96	4,665
Average Daily	—	—	—	—	—	—	—	—	—
Mobile	2.37	1.49	0.02	3.39	3.41	0.02	0.86	0.88	3,472
Area	5.69	0.06	< 0.005	—	< 0.005	< 0.005	—	< 0.005	19.4
Energy	0.03	0.53	0.04	—	0.04	0.04	—	0.04	765
Water	—	—	—	—	—	—	—	—	25.3
Waste	—	—	—	—	—	—	—	—	261
Refrig.	—	—	—	—	—	—	—	—	1.42
Stationary	0.08	0.04	< 0.005	0.00	< 0.005	< 0.005	0.00	< 0.005	38.7

Total	8.17	2.12	0.07	3.39	3.46	0.07	0.86	0.93	4,583
Annual	—	—	—	—	—	—	—	—	—
Mobile	0.43	0.27	< 0.005	0.62	0.62	< 0.005	0.16	0.16	575
Area	1.04	0.01	< 0.005	—	< 0.005	< 0.005	—	< 0.005	3.21
Energy	0.01	0.10	0.01	—	0.01	0.01	—	0.01	127
Water	—	—	—	—	—	—	—	—	4.19
Waste	—	—	—	—	—	—	—	—	43.2
Refrig.	—	—	—	—	—	—	—	—	0.24
Stationary	0.01	0.01	< 0.005	0.00	< 0.005	< 0.005	0.00	< 0.005	6.40
Total	1.49	0.39	0.01	0.62	0.63	0.01	0.16	0.17	759

3. Construction Emissions Details

3.1. Demolition (2026) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	CO2e
Onsite	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.17	1.58	0.05	—	0.05	0.05	—	0.05	371
Demolition	—	—	—	0.16	0.16	—	0.02	0.02	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.10	< 0.005	—	< 0.005	< 0.005	—	< 0.005	22.3
Demolition	—	—	—	0.01	0.01	—	< 0.005	< 0.005	—

Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	0.02	< 0.005	—	< 0.005	< 0.005	—	< 0.005	3.70
Demolition	—	—	—	< 0.005	< 0.005	—	< 0.005	< 0.005	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—
Worker	0.02	0.02	0.00	0.06	0.06	0.00	0.01	0.01	60.0
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	< 0.005	0.21	< 0.005	0.04	0.04	< 0.005	0.01	0.01	148
Average Daily	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	3.64
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	< 0.005	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	8.94
Annual	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	0.60
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	1.48

3.3. Site Preparation (2026) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	CO2e
Onsite	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—

Daily, Winter Max)	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.06	0.57	0.02	—	0.02	0.02	—	0.02	160
Dust From Material Movement	—	—	—	0.00	0.00	—	0.00	0.00	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.07	< 0.005	—	< 0.005	< 0.005	—	< 0.005	18.4
Dust From Material Movement	—	—	—	0.00	0.00	—	0.00	0.00	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	0.01	< 0.005	—	< 0.005	< 0.005	—	< 0.005	3.05
Dust From Material Movement	—	—	—	0.00	0.00	—	0.00	0.00	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—
Daily, Summer Max)	—	—	—	—	—	—	—	—	—
Daily, Winter Max)	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.00	0.02	0.02	0.00	< 0.005	< 0.005	20.0
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	2.31
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	0.38
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.5. Grading (2026) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	CO2e
Onsite	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.06	0.59	0.02	—	0.02	0.02	—	0.02	128
Dust From Material Movement	—	—	—	< 0.005	< 0.005	—	< 0.005	< 0.005	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.06	0.59	0.02	—	0.02	0.02	—	0.02	128
Dust From Material Movement	—	—	—	< 0.005	< 0.005	—	< 0.005	< 0.005	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.10	< 0.005	—	< 0.005	< 0.005	—	< 0.005	22.4
Dust From Material Movement	—	—	—	< 0.005	< 0.005	—	< 0.005	< 0.005	—

Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	0.02	< 0.005	—	< 0.005	< 0.005	—	< 0.005	3.71
Dust From Material Movement	—	—	—	< 0.005	< 0.005	—	< 0.005	< 0.005	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—
Daily, Summer Max)	—	—	—	—	—	—	—	—	—
Worker	0.02	0.01	0.00	0.04	0.04	0.00	0.01	0.01	43.0
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.02	1.65	0.02	0.30	0.32	0.01	0.08	0.09	1,219
Daily, Winter Max)	—	—	—	—	—	—	—	—	—
Worker	0.02	0.01	0.00	0.04	0.04	0.00	0.01	0.01	40.0
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.02	1.74	0.02	0.30	0.32	0.01	0.08	0.09	1,217
Average Daily	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.00	0.01	0.01	0.00	< 0.005	< 0.005	7.05
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	< 0.005	0.30	< 0.005	0.05	0.06	< 0.005	0.01	0.02	214
Annual	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	1.17
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	< 0.005	0.05	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	35.4

3.7. Building Construction (2026) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	CO2e
Onsite	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.35	3.26	0.13	—	0.13	0.12	—	0.12	914
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.35	3.26	0.13	—	0.13	0.12	—	0.12	914
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.11	0.98	0.04	—	0.04	0.04	—	0.04	274
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.02	0.18	0.01	—	0.01	0.01	—	0.01	45.3
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—
Worker	0.56	0.35	0.00	1.32	1.32	0.00	0.31	0.31	1,376
Vendor	0.03	1.13	0.01	0.22	0.23	0.01	0.06	0.07	865
Hauling	0.01	0.71	0.01	0.13	0.14	0.01	0.04	0.04	528
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—
Worker	0.49	0.45	0.00	1.32	1.32	0.00	0.31	0.31	1,281
Vendor	0.03	1.19	0.01	0.22	0.23	0.01	0.06	0.07	863
Hauling	0.01	0.75	0.01	0.13	0.14	0.01	0.04	0.04	527

Average Daily	—	—	—	—	—	—	—	—	—
Worker	0.15	0.12	0.00	0.39	0.39	0.00	0.09	0.09	386
Vendor	0.01	0.35	< 0.005	0.06	0.07	< 0.005	0.02	0.02	259
Hauling	< 0.005	0.22	< 0.005	0.04	0.04	< 0.005	0.01	0.01	158
Annual	—	—	—	—	—	—	—	—	—
Worker	0.03	0.02	0.00	0.07	0.07	0.00	0.02	0.02	63.9
Vendor	< 0.005	0.06	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	42.8
Hauling	< 0.005	0.04	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	26.1

.9. Building Construction (2027) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	CO2e
Onsite	—	—	—	—	—	—	—	—	—
Daily, Summer Max)	—	—	—	—	—	—	—	—	—
Daily, Winter Max)	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.35	3.11	0.12	—	0.12	0.11	—	0.11	914
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.02	0.19	0.01	—	0.01	0.01	—	0.01	55.5
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	0.03	< 0.005	—	< 0.005	< 0.005	—	< 0.005	9.18
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—
Worker	0.47	0.41	0.00	1.32	1.32	0.00	0.31	0.31	1,258
Vendor	0.03	1.13	0.01	0.22	0.23	0.01	0.06	0.07	846
Hauling	0.01	0.72	0.01	0.13	0.14	0.01	0.04	0.04	515
Average Daily	—	—	—	—	—	—	—	—	—
Worker	0.03	0.02	0.00	0.08	0.08	0.00	0.02	0.02	76.7
Vendor	< 0.005	0.07	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	51.3
Hauling	< 0.005	0.04	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	31.2
Annual	—	—	—	—	—	—	—	—	—
Worker	0.01	< 0.005	0.00	0.01	0.01	0.00	< 0.005	< 0.005	12.7
Vendor	< 0.005	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	8.50
Hauling	< 0.005	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	5.17

3.11. Paving (2027) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	CO2e
Onsite	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.06	0.52	0.02	—	0.02	0.02	—	0.02	110
Paving	0.00	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.06	0.52	0.02	—	0.02	0.02	—	0.02	110

'aving	0.00	—	—	—	—	—	—	—	—
)nsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
\verage Daily	—	—	—	—	—	—	—	—	—
)ff-Road :quipment	0.01	0.06	< 0.005	—	< 0.005	< 0.005	—	< 0.005	13.6
'aving	0.00	—	—	—	—	—	—	—	—
)nsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
\nnual	—	—	—	—	—	—	—	—	—
)ff-Road :quipment	< 0.005	0.01	< 0.005	—	< 0.005	< 0.005	—	< 0.005	2.25
'aving	0.00	—	—	—	—	—	—	—	—
)nsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
)ffsite	—	—	—	—	—	—	—	—	—
)aily, Summer Max)	—	—	—	—	—	—	—	—	—
Vorker	0.02	0.01	0.00	0.04	0.04	0.00	0.01	0.01	42.2
/endor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-lauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
)aily, Winter Max)	—	—	—	—	—	—	—	—	—
Vorker	0.01	0.01	0.00	0.04	0.04	0.00	0.01	0.01	39.3
/endor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-lauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
\verage Daily	—	—	—	—	—	—	—	—	—
Vorker	< 0.005	< 0.005	0.00	0.01	0.01	0.00	< 0.005	< 0.005	4.87
/endor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-lauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
\nnual	—	—	—	—	—	—	—	—	—
Vorker	< 0.005	< 0.005	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	0.81
/endor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.13. Architectural Coating (2026) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	CO2e
Onsite	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.07	0.56	0.01	—	0.01	0.01	—	0.01	93.3
Architectural Coatings	14.4	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.07	< 0.005	—	< 0.005	< 0.005	—	< 0.005	11.1
Architectural Coatings	1.71	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	0.01	< 0.005	—	< 0.005	< 0.005	—	< 0.005	1.84
Architectural Coatings	0.31	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—

Vorker	0.10	0.09	0.00	0.26	0.26	0.00	0.06	0.06	256
'endor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
lauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
verage Daily	—	—	—	—	—	—	—	—	—
Vorker	0.01	0.01	0.00	0.03	0.03	0.00	0.01	0.01	30.8
'endor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
lauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
nnual	—	—	—	—	—	—	—	—	—
Vorker	< 0.005	< 0.005	0.00	0.01	0.01	0.00	< 0.005	< 0.005	5.09
'endor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
lauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

.15. Architectural Coating (2027) - Unmitigated

riteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

ocation	ROG	NOx	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	CO2e
)nsite	—	—	—	—	—	—	—	—	—
)aily, Summer Max)	—	—	—	—	—	—	—	—	—
)ff-Road Equipment	0.06	0.55	0.01	—	0.01	0.01	—	0.01	93.3
Architectural Coatings	14.4	—	—	—	—	—	—	—	—
)nsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
)aily, Winter (Max)	—	—	—	—	—	—	—	—	—
)ff-Road Equipment	0.06	0.55	0.01	—	0.01	0.01	—	0.01	93.3
Architectural Coatings	14.4	—	—	—	—	—	—	—	—
)nsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Average Daily	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.03	0.23	< 0.005	—	< 0.005	< 0.005	—	< 0.005	38.9
Architectural Coatings	5.99	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	0.04	< 0.005	—	< 0.005	< 0.005	—	< 0.005	6.44
Architectural Coatings	1.09	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—
Worker	0.10	0.07	0.00	0.26	0.26	0.00	0.06	0.06	270
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—
Worker	0.09	0.08	0.00	0.26	0.26	0.00	0.06	0.06	252
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—
Worker	0.04	0.03	0.00	0.11	0.11	0.00	0.03	0.03	105
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.00	0.02	0.02	0.00	< 0.005	< 0.005	17.4
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

.17. Trenching (2026) - Unmitigated

riteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

ocation	ROG	NOx	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	CO2e
)nsite	—	—	—	—	—	—	—	—	—
)aily, Summer Max)	—	—	—	—	—	—	—	—	—
)ff-Road Equipment	0.03	0.30	0.01	—	0.01	0.01	—	0.01	83.8
)nsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
)aily, Winter Max)	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—
)ff-Road Equipment	0.01	0.05	< 0.005	—	< 0.005	< 0.005	—	< 0.005	15.1
)nsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—
)ff-Road Equipment	< 0.005	0.01	< 0.005	—	< 0.005	< 0.005	—	< 0.005	2.51
)nsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
)ffsite	—	—	—	—	—	—	—	—	—
)aily, Summer (Max)	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.00	0.02	0.02	0.00	< 0.005	< 0.005	21.5
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	3.64
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	0.60
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

4. Operations Emissions Details

4.1. Mobile Emissions by Land Use

4.1.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—
Apartments High Rise	2.61	1.39	0.02	3.55	3.57	0.02	0.90	0.92	3,819
Unenclosed Parking with Elevator	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	2.61	1.39	0.02	3.55	3.57	0.02	0.90	0.92	3,819
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—
Apartments High Rise	2.51	1.64	0.02	3.55	3.57	0.02	0.90	0.92	3,612
Unenclosed Parking with Elevator	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	2.51	1.64	0.02	3.55	3.57	0.02	0.90	0.92	3,612
Annual	—	—	—	—	—	—	—	—	—
Apartments High Rise	0.43	0.27	< 0.005	0.62	0.62	< 0.005	0.16	0.16	575

Unenclosed Parking with Elevator	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	0.43	0.27	< 0.005	0.62	0.62	< 0.005	0.16	0.16	575

.2. Energy

.2.1. Electricity Emissions By Land Use - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—
Apartments High Rise	—	—	—	—	—	—	—	—	70.4
Unenclosed Parking with Elevator	—	—	—	—	—	—	—	—	20.1
Total	—	—	—	—	—	—	—	—	90.5
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—
Apartments High Rise	—	—	—	—	—	—	—	—	70.4
Unenclosed Parking with Elevator	—	—	—	—	—	—	—	—	20.1
Total	—	—	—	—	—	—	—	—	90.5
Annual	—	—	—	—	—	—	—	—	—
Apartments High Rise	—	—	—	—	—	—	—	—	11.6
Unenclosed Parking with Elevator	—	—	—	—	—	—	—	—	3.34
Total	—	—	—	—	—	—	—	—	15.0

4.2.3. Natural Gas Emissions By Land Use - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—
Apartments High Rise	0.03	0.53	0.04	—	0.04	0.04	—	0.04	675
Unenclosed Parking with Elevator	0.00	0.00	0.00	—	0.00	0.00	—	0.00	0.00
Total	0.03	0.53	0.04	—	0.04	0.04	—	0.04	675
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—
Apartments High Rise	0.03	0.53	0.04	—	0.04	0.04	—	0.04	675
Unenclosed Parking with Elevator	0.00	0.00	0.00	—	0.00	0.00	—	0.00	0.00
Total	0.03	0.53	0.04	—	0.04	0.04	—	0.04	675
Annual	—	—	—	—	—	—	—	—	—
Apartments High Rise	0.01	0.10	0.01	—	0.01	0.01	—	0.01	112
Unenclosed Parking with Elevator	0.00	0.00	0.00	—	0.00	0.00	—	0.00	0.00
Total	0.01	0.10	0.01	—	0.01	0.01	—	0.01	112

4.3. Area Emissions by Source

4.3.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Source	ROG	NOx	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	CO2e

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—
Hearths	0.00	0.00	0.00	—	0.00	0.00	—	0.00	0.00
Consumer Products	4.26	—	—	—	—	—	—	—	—
Architectural Coatings	0.77	—	—	—	—	—	—	—	—
Landscape Equipment	1.36	0.12	0.01	—	0.01	0.01	—	0.01	39.4
Total	6.38	0.12	0.01	—	0.01	0.01	—	0.01	39.4
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—
Hearths	0.00	0.00	0.00	—	0.00	0.00	—	0.00	0.00
Consumer Products	4.26	—	—	—	—	—	—	—	—
Architectural Coatings	0.77	—	—	—	—	—	—	—	—
Total	5.02	0.00	0.00	—	0.00	0.00	—	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—
Hearths	0.00	0.00	0.00	—	0.00	0.00	—	0.00	0.00
Consumer Products	0.78	—	—	—	—	—	—	—	—
Architectural Coatings	0.14	—	—	—	—	—	—	—	—
Landscape Equipment	0.12	0.01	< 0.005	—	< 0.005	< 0.005	—	< 0.005	3.21
Total	1.04	0.01	< 0.005	—	< 0.005	< 0.005	—	< 0.005	3.21

.4. Water Emissions by Land Use

.4.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—
Apartments High Rise	—	—	—	—	—	—	—	—	25.3
Unenclosed Parking with Elevator	—	—	—	—	—	—	—	—	0.00
Total	—	—	—	—	—	—	—	—	25.3
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—
Apartments High Rise	—	—	—	—	—	—	—	—	25.3
Unenclosed Parking with Elevator	—	—	—	—	—	—	—	—	0.00
Total	—	—	—	—	—	—	—	—	25.3
Annual	—	—	—	—	—	—	—	—	—
Apartments High Rise	—	—	—	—	—	—	—	—	4.19
Unenclosed Parking with Elevator	—	—	—	—	—	—	—	—	0.00
Total	—	—	—	—	—	—	—	—	4.19

4.5. Waste Emissions by Land Use

4.5.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—

Apartments High Rise	—	—	—	—	—	—	—	—	261
Unenclosed Parking with Elevator	—	—	—	—	—	—	—	—	0.00
Total	—	—	—	—	—	—	—	—	261
Daily, Winter Max)	—	—	—	—	—	—	—	—	—
Apartments High Rise	—	—	—	—	—	—	—	—	261
Unenclosed Parking with Elevator	—	—	—	—	—	—	—	—	0.00
Total	—	—	—	—	—	—	—	—	261
Annual	—	—	—	—	—	—	—	—	—
Apartments High Rise	—	—	—	—	—	—	—	—	43.2
Unenclosed Parking with Elevator	—	—	—	—	—	—	—	—	0.00
Total	—	—	—	—	—	—	—	—	43.2

4.6. Refrigerant Emissions by Land Use

4.6.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—
Apartments High Rise	—	—	—	—	—	—	—	—	1.42
Total	—	—	—	—	—	—	—	—	1.42

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—
Apartments High Rise	—	—	—	—	—	—	—	—	1.42
Total	—	—	—	—	—	—	—	—	1.42
Annual	—	—	—	—	—	—	—	—	—
Apartments High Rise	—	—	—	—	—	—	—	—	0.24
Total	—	—	—	—	—	—	—	—	0.24

4.7. Offroad Emissions By Equipment Type

4.7.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	ROG	NOx	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—

4.8. Stationary Emissions By Equipment Type

4.8.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	ROG	NOx	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—

Emergency Generator	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—
Emergency Generator	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—
Emergency Generator	0.01	0.01	< 0.005	0.00	< 0.005	< 0.005	0.00	< 0.005	6.40
Total	0.01	0.01	< 0.005	0.00	< 0.005	< 0.005	0.00	< 0.005	6.40

.9. User Defined Emissions By Equipment Type

.9.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	ROG	NOx	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—

4.10. Soil Carbon Accumulation By Vegetation Type

4.10.1. Soil Carbon Accumulation By Vegetation Type - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Vegetation	ROG	NOx	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—

4.10.2. Above and Belowground Carbon Accumulation by Land Use Type - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—

4.10.3. Avoided and Sequestered Emissions by Species - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Species	ROG	NOx	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—

Subtotal	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—
Daily, Winter Max)	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—

5. Activity Data

5.1. Construction Schedule

Phase Name	Phase Type	Start Date	End Date	Days Per Week	Work Days per Phase	Phase Description
Demolition	Demolition	1/1/2026	1/31/2026	5.00	22.0	—
Site Preparation	Site Preparation	2/1/2026	3/31/2026	5.00	42.0	—

Grading	Grading	2/1/2026	4/30/2026	5.00	64.0	—
Building Construction	Building Construction	8/1/2026	1/31/2027	5.00	130	—
Paving	Paving	3/1/2027	5/1/2027	5.00	45.0	—
Architectural Coating	Architectural Coating	11/1/2026	8/1/2027	5.00	195	—
Trenching	Trenching	5/1/2026	7/31/2026	5.00	66.0	—

5.2. Off-Road Equipment

5.2.1. Unmitigated

Phase Name	Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor
Demolition	Concrete/Industrial Saws	Diesel	Average	1.00	0.70	33.0	0.73
Demolition	Tractors/Loaders/Backhoes	Diesel	Average	1.00	7.00	84.0	0.37
Demolition	Excavators	Diesel	Average	1.00	5.30	36.0	0.38
Site Preparation	Tractors/Loaders/Backhoes	Diesel	Average	1.00	4.40	84.0	0.37
Grading	Tractors/Loaders/Backhoes	Diesel	Average	1.00	1.80	84.0	0.37
Grading	Excavators	Diesel	Average	1.00	3.50	36.0	0.38
Building Construction	Cranes	Diesel	Average	1.00	7.00	367	0.29
Building Construction	Forklifts	Diesel	Average	1.00	1.00	82.0	0.20
Building Construction	Welders	Diesel	Average	1.00	1.00	46.0	0.45
Paving	Cement and Mortar Mixers	Diesel	Average	1.00	5.30	10.0	0.56
Paving	Tractors/Loaders/Backhoes	Diesel	Average	1.00	2.00	84.0	0.37
Architectural Coating	Air Compressors	Diesel	Average	1.00	3.10	37.0	0.48
Architectural Coating	Aerial Lifts	Diesel	Average	1.00	1.30	46.0	0.31
Trenching	Tractors/Loaders/Backhoes	Diesel	Average	1.00	2.30	84.0	0.37

.3. Construction Vehicles

.3.1. Unmitigated

Phase Name	Trip Type	One-Way Trips per Day	Miles per Trip	Vehicle Mix
Demolition	—	—	—	—
Demolition	Worker	7.50	11.7	LDA,LDT1,LDT2
Demolition	Vendor	—	8.40	HHDT,MHDT
Demolition	Hauling	1.94	20.0	HHDT
Demolition	Onsite truck	—	—	HHDT
Site Preparation	—	—	—	—
Site Preparation	Worker	2.50	11.7	LDA,LDT1,LDT2
Site Preparation	Vendor	—	8.40	HHDT,MHDT
Site Preparation	Hauling	0.00	20.0	HHDT
Site Preparation	Onsite truck	—	—	HHDT
Grading	—	—	—	—
Grading	Worker	5.00	11.7	LDA,LDT1,LDT2
Grading	Vendor	—	8.40	HHDT,MHDT
Grading	Hauling	15.9	20.0	HHDT
Grading	Onsite truck	—	—	HHDT
Building Construction	—	—	—	—
Building Construction	Worker	160	11.7	LDA,LDT1,LDT2
Building Construction	Vendor	29.9	8.40	HHDT,MHDT
Building Construction	Hauling	6.90	20.0	HHDT
Building Construction	Onsite truck	—	—	HHDT
Paving	—	—	—	—
Paving	Worker	5.00	11.7	LDA,LDT1,LDT2
Paving	Vendor	—	8.40	HHDT,MHDT
Paving	Hauling	0.00	20.0	HHDT

Paving	Onsite truck	—	—	HHDT
Architectural Coating	—	—	—	—
Architectural Coating	Worker	32.0	11.7	LDA,LDT1,LDT2
Architectural Coating	Vendor	—	8.40	HHDT,MHDT
Architectural Coating	Hauling	0.00	20.0	HHDT
Architectural Coating	Onsite truck	—	—	HHDT
Trenching	—	—	—	—
Trenching	Worker	2.50	11.7	LDA,LDT1,LDT2
Trenching	Vendor	—	8.40	HHDT,MHDT
Trenching	Hauling	0.00	20.0	HHDT
Trenching	Onsite truck	—	—	HHDT

5.4. Vehicles

5.4.1. Construction Vehicle Control Strategies

Non-applicable. No control strategies activated by user.

5.5. Architectural Coatings

Phase Name	Residential Interior Area Coated (sq ft)	Residential Exterior Area Coated (sq ft)	Non-Residential Interior Area Coated (sq ft)	Non-Residential Exterior Area Coated (sq ft)	Parking Area Coated (sq ft)
Architectural Coating	402,758	134,253	0.00	0.00	—

5.6. Dust Mitigation

5.6.1. Construction Earthmoving Activities

Phase Name	Material Imported (cy)	Material Exported (cy)	Acres Graded (acres)	Material Demolished (Building Square Footage)	Acres Paved (acres)
Demolition	0.00	0.00	0.00	3,400	—
Site Preparation	—	—	0.00	0.00	—

Grading	—	8,155	0.00	0.00	—
Paving	0.00	0.00	0.00	0.00	0.00

.6.2. Construction Earthmoving Control Strategies

Control Strategies Applied	Frequency (per day)	PM10 Reduction	PM2.5 Reduction
Water Exposed Area	2	61%	61%

.7. Construction Paving

Land Use	Area Paved (acres)	% Asphalt
Apartments High Rise	—	0%
Unenclosed Parking with Elevator	0.00	100%

.8. Construction Electricity Consumption and Emissions Factors

Wh per Year and Emission Factor (lb/MWh)

Year	kWh per Year	CO2	CH4	N2O
2026	0.00	188	0.03	< 0.005
2027	0.00	188	0.03	< 0.005

.9. Operational Mobile Sources

.9.1. Unmitigated

Land Use Type	Trips/Weekday	Trips/Saturday	Trips/Sunday	Trips/Year	VMT/Weekday	VMT/Saturday	VMT/Sunday	VMT/Year
Apartments High Rise	832	847	671	296,129	4,957	5,047	3,999	1,764,160
Unenclosed Parking with Elevator	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

5.10. Operational Area Sources

5.10.1. Hearths

5.10.1.1. Unmitigated

Hearth Type	Unmitigated (number)
Apartments High Rise	—
Wood Fireplaces	0
Gas Fireplaces	0
Propane Fireplaces	0
Electric Fireplaces	0
No Fireplaces	0
Conventional Wood Stoves	0
Catalytic Wood Stoves	0
Non-Catalytic Wood Stoves	0
Pellet Wood Stoves	0

5.10.2. Architectural Coatings

Residential Interior Area Coated (sq ft)	Residential Exterior Area Coated (sq ft)	Non-Residential Interior Area Coated (sq ft)	Non-Residential Exterior Area Coated (sq ft)	Parking Area Coated (sq ft)
402758.32499999995	134,253	0.00	0.00	—

5.10.3. Landscape Equipment

Season	Unit	Value
Snow Days	day/yr	0.00
Summer Days	day/yr	180

.11. Operational Energy Consumption

.11.1. Unmitigated

lectricity (kWh/yr) and CO2 and CH4 and N2O and Natural Gas (kBTU/yr)

and Use	Electricity (kWh/yr)	CO2	CH4	N2O	Natural Gas (kBTU/yr)
partments High Rise	597,054	41.0	0.0330	0.0040	2,100,214
nenclosed Parking with levator	170,954	41.0	0.0330	0.0040	0.00

.12. Operational Water and Wastewater Consumption

.12.1. Unmitigated

and Use	Indoor Water (gal/year)	Outdoor Water (gal/year)
partments High Rise	5,651,514	0.00
nenclosed Parking with Elevator	0.00	0.00

.13. Operational Waste Generation

.13.1. Unmitigated

and Use	Waste (ton/year)	Cogeneration (kWh/year)
partments High Rise	138	—
nenclosed Parking with Elevator	0.00	—

.14. Operational Refrigeration and Air Conditioning Equipment

.14.1. Unmitigated

and Use Type	Equipment Type	Refrigerant	GWP	Quantity (kg)	Operations Leak Rate	Service Leak Rate	Times Serviced

Apartments High Rise	Average room A/C & Other residential A/C and heat pumps	R-410A	2,088	< 0.005	2.50	2.50	10.0
Apartments High Rise	Household refrigerators and/or freezers	R-134a	1,430	0.12	0.60	0.00	1.00

5.15. Operational Off-Road Equipment

5.15.1. Unmitigated

Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor

5.16. Stationary Sources

5.16.1. Emergency Generators and Fire Pumps

Equipment Type	Fuel Type	Number per Day	Hours per Day	Hours per Year	Horsepower	Load Factor
Emergency Generator	Diesel	1.00	0.00	50.0	335	0.73

5.16.2. Process Boilers

Equipment Type	Fuel Type	Number	Boiler Rating (MMBtu/hr)	Daily Heat Input (MMBtu/day)	Annual Heat Input (MMBtu/yr)

5.17. User Defined

Equipment Type	Fuel Type

5.18. Vegetation

5.18.1. Land Use Change

5.18.1.1. Unmitigated

Vegetation Land Use Type	Vegetation Soil Type	Initial Acres	Final Acres

.18.1. Biomass Cover Type

.18.1.1. Unmitigated

Biomass Cover Type	Initial Acres	Final Acres

.18.2. Sequestration

.18.2.1. Unmitigated

Tree Type	Number	Electricity Saved (kWh/year)	Natural Gas Saved (btu/year)

5. Climate Risk Detailed Report

.1. Climate Risk Summary

Cal-Adapt midcentury 2040–2059 average projections for four hazards are reported below for your project location. These are under Representation Concentration Pathway (RCP) 8.5 which assumes GHG emissions will continue to rise strongly through 2050 and then plateau around 2100.

Climate Hazard	Result for Project Location	Unit
Temperature and Extreme Heat	9.12	annual days of extreme heat
Extreme Precipitation	15.8	annual days with precipitation above 20 mm
Sea Level Rise	—	meters of inundation depth
Wildfire	7.96	annual hectares burned

Temperature and Extreme Heat data are for grid cell in which your project are located. The projection is based on the 98th historical percentile of daily maximum/minimum temperatures from observed historical data (32 climate model ensemble from Cal-Adapt, 2040–2059 average under RCP 8.5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.
Extreme Precipitation data are for the grid cell in which your project are located. The threshold of 20 mm is equivalent to about ¾ an inch of rain, which would be light to moderate rainfall if received over a full day or heavy rain if received over a period of 2 to 4 hours. Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.
Sea Level Rise data are for the grid cell in which your project are located. The projections are from Radke et al. (2017), as reported in Cal-Adapt (Radke et al., 2017, CEC-500-2017-008), and consider inundation location and depth for the San Francisco Bay, the Sacramento-San Joaquin River Delta and California coast resulting different increments of sea level rise coupled with extreme storm events. Users may select from four scenarios to view the range in potential inundation depth for the grid cell. The four scenarios are: No rise, 0.5 meter, 1.0 meter, 1.41 meters

Wildfire data are for the grid cell in which your project are located. The projections are from UC Davis, as reported in Cal-Adapt (2040–2059 average under RCP 8.5), and consider historical data f climate, vegetation, population density, and large (> 400 ha) fire history. Users may select from four model simulations to view the range in potential wildfire probabilities for the grid cell. The our simulations make different assumptions about expected rainfall and temperature are: Warmer/drier (HadGEM2-ES), Cooler/wetter (CNRM-CM5), Average conditions (CanESM2), Range of ifferent rainfall and temperature possibilities (MIROC5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.

5.2. Initial Climate Risk Scores

Climate Hazard	Exposure Score	Sensitivity Score	Adaptive Capacity Score	Vulnerability Score
Temperature and Extreme Heat	N/A	N/A	N/A	N/A
Extreme Precipitation	N/A	N/A	N/A	N/A
Sea Level Rise	N/A	N/A	N/A	N/A
Wildfire	N/A	N/A	N/A	N/A
Flooding	N/A	N/A	N/A	N/A
Drought	N/A	N/A	N/A	N/A
Snowpack Reduction	N/A	N/A	N/A	N/A
Air Quality Degradation	0	0	0	N/A

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the reatest exposure.
The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 epresenting the greatest ability to adapt.
The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores do not include implementation of climate risk reduction neasures.

5.3. Adjusted Climate Risk Scores

Climate Hazard	Exposure Score	Sensitivity Score	Adaptive Capacity Score	Vulnerability Score
Temperature and Extreme Heat	N/A	N/A	N/A	N/A
Extreme Precipitation	N/A	N/A	N/A	N/A
Sea Level Rise	N/A	N/A	N/A	N/A
Wildfire	N/A	N/A	N/A	N/A
Flooding	N/A	N/A	N/A	N/A
Drought	N/A	N/A	N/A	N/A
Snowpack Reduction	N/A	N/A	N/A	N/A
Air Quality Degradation	1	1	1	2

ne sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the eatest exposure.
ne adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 presenting the greatest ability to adapt.
ne overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores include implementation of climate risk reduction easures.

.4. Climate Risk Reduction Measures

'. Health and Equity Details

.1. CalEnviroScreen 4.0 Scores

ne maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.

ndicator	Result for Project Census Tract
Exposure Indicators	—
AQ-Ozone	7.52
AQ-PM	20.3
AQ-DPM	51.9
Drinking Water	7.43
Lead Risk Housing	42.4
Pesticides	0.00
Toxic Releases	43.6
Traffic	45.8
Effect Indicators	—
CleanUp Sites	59.9
Groundwater	77.5
Haz Waste Facilities/Generators	96.6
mpaired Water Bodies	12.5
Solid Waste	63.7
Sensitive Population	—
Asthma	17.5

Cardio-vascular	18.2
Low Birth Weights	14.2
Socioeconomic Factor Indicators	—
Education	36.2
Housing	59.3
Linguistic	35.3
Poverty	28.9
Unemployment	9.72

7.2. Healthy Places Index Scores

The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

Indicator	Result for Project Census Tract
Economic	—
Above Poverty	55.48569229
Employed	79.36609778
Median HI	65.46901065
Education	—
Bachelor's or higher	80.61080457
High school enrollment	100
Preschool enrollment	95.7141024
Transportation	—
Auto Access	24.53483896
Active commuting	91.03041191
Social	—
2-parent households	19.31220326
Voting	91.08174002
Neighborhood	—
Alcohol availability	34.45399718

Park access	81.35506224
Retail density	90.06800975
Supermarket access	76.04260234
Tree canopy	95.68843834
Housing	—
Homeownership	16.91261388
Housing habitability	43.15411267
Low-inc homeowner severe housing cost burden	40.69036315
Low-inc renter severe housing cost burden	55.66534069
Uncrowded housing	66.9190299
Health Outcomes	—
Insured adults	43.11561658
Arthritis	0.0
Asthma ER Admissions	69.5
High Blood Pressure	0.0
Cancer (excluding skin)	0.0
Asthma	0.0
Coronary Heart Disease	0.0
Chronic Obstructive Pulmonary Disease	0.0
Diagnosed Diabetes	0.0
Life Expectancy at Birth	39.2
Cognitively Disabled	70.6
Physically Disabled	47.8
Heart Attack ER Admissions	80.9
Mental Health Not Good	0.0
Chronic Kidney Disease	0.0
Obesity	0.0
Pedestrian Injuries	98.8

Physical Health Not Good	0.0
Stroke	0.0
Health Risk Behaviors	—
Binge Drinking	0.0
Current Smoker	0.0
No Leisure Time for Physical Activity	0.0
Climate Change Exposures	—
Wildfire Risk	0.0
SLR Inundation Area	34.2
Children	95.8
Elderly	45.9
English Speaking	85.7
Foreign-born	27.1
Outdoor Workers	55.9
Climate Change Adaptive Capacity	—
Impervious Surface Cover	58.7
Traffic Density	50.8
Traffic Access	69.1
Other Indices	—
Hardship	11.6
Other Decision Support	—
2016 Voting	89.4

7.3. Overall Health & Equity Scores

Metric	Result for Project Census Tract
CalEnviroScreen 4.0 Score for Project Location (a)	19.0
Healthy Places Index Score for Project Location (b)	82.0
Project Located in a Designated Disadvantaged Community (Senate Bill 535)	No

Project Located in a Low-Income Community (Assembly Bill 1550)	Yes
Project Located in a Community Air Protection Program Community (Assembly Bill 617)	No

The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.
The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

.4. Health & Equity Measures

o Health & Equity Measures selected.

.5. Evaluation Scorecard

ealth & Equity Evaluation Scorecard not completed.

.6. Health & Equity Custom Measures

o Health & Equity Custom Measures created.

3. User Changes to Default Data

Screen	Justification
Characteristics: Utility Information	MCE is San Rafael default clean energy provider. MCE 2021-2023 average power content label rate = 41 lb/MWh.
Land Use	Total lot acreage (converted from provided sf to acres), number of units and parking spaces, and square footages provided by filled out construction worksheet.
Construction: Construction Phases	Information provided by filled out construction worksheet.
Construction: Off-Road Equipment	Information provided by filled out construction worksheet.
Construction: Trips and VMT	Demolition = 13 tons of pavement demo'ed and hauled (0.12 trips/day), Building Construction = 450 concrete truck round trips (6.9 trips/day).
Construction: On-Road Fugitive Dust	Air District BMPs = 15 mph. Required by San Rafael Downtown EIR.
Operations: Hearths	No hearths.
Operations: Water and Waste Water	Wastewater treatment 100% aerobic - no septic tanks or lagoons.
Operations: Generators + Pumps EF	Generator greater than 50-hp requires BACT Tier 4 , NOx = 0.5 g/bhp-hr, PMs = 0.02 g/bhp-hp

KSR CIVIL ENGINEERING

215 Lafayette Circle, Suite A
Lafayette, CA 94549
Phone: 510-774-5471
Email: mattrei59@gmail.com
RCE 39863 LLS 7115

STORMWATER CONTROL PLAN (SWCP)

SAN RAFAEL

PROJECT NAME & OWNER

1230 FIFTH AVENUE
MONAHAN PACIFIC CORPORATION

PROJECT LOCATION

1230 FIFTH AVENUE
SAN RAFAEL, CA 94901

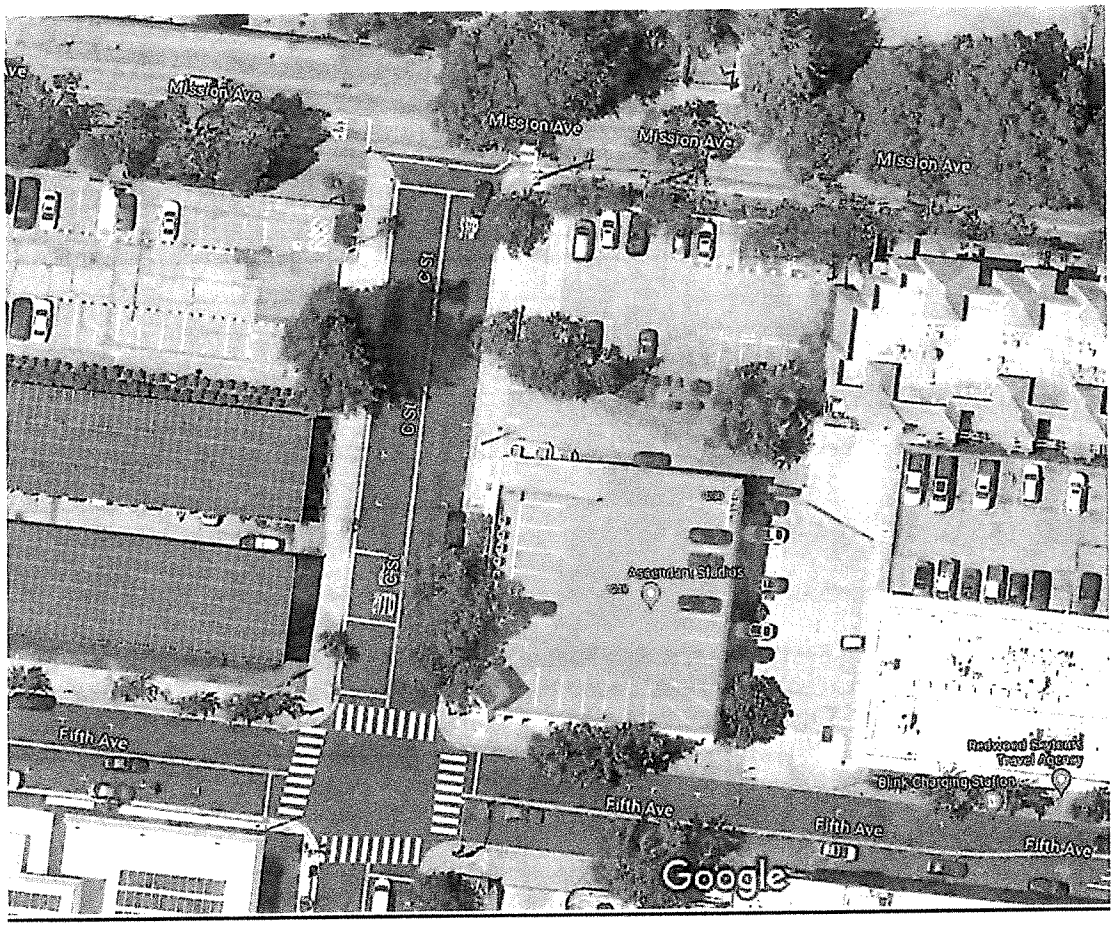
PREPARED FOR

MONAHAN PACIFIC CORPORATION
1101 FIFTH AVENUE, SUITE 300
SAN RAFAEL, CA 94901

PREPARED BY

KSR CIVIL ENGINEERING
215 LAFAYETTE CIRCLE, SUITE A
LAFAYETTE, CA 94549

PREPARED: OCTOBER 30, 2024



VICINITY MAP

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Table 1 – Project Data

Project Name/Number	1230 Fifth Avenue Development
Application Submittal Date	November 2024
Project Location	1230 Fifth Avenue, San Rafael, CA
Name of Developer	Monahan Pacific Corporation
Project Phase No.	N/A
Project Type and Description	13-story - 187-unit proposed project and 157 parking spaces on three levels
Total Project Site Area (acres)	0.65 Acres
Total New and Replaced Impervious Surface Area	25,261 sf
Total Pre-Project Impervious Surface Area	26,510 sf
Total Post-Project Impervious Surface Area	25,261 sf

II. SETTING

A. Project Location & Description

The Project Site is located at 1230 Fifth Avenue in San Rafael, Marin County, at the northeast corner of Fifth Avenue and C Street. The subject parcel is bounded by Mission Street to the north, C Street to the west and Fifth Street to the south. The Project Site shares a property line with two neighbors to the east; one is an existing three-story residential building along Mission Street; and the other is a one-story commercial building along Fifth Avenue. The area of the subject parcel, Assessor's Parcel Number 011-300-26, is 28,341 square feet, or 0.65 acres, and is roughly rectangular in shape. The zoning for the subject parcel is T4N & T5N. The proposed project is a 13-story, 187-unit, Housing Project, including a 157-car parking lot, accessed on the ground floor on Fifth Avenue; the second floor on C Street; and the third floor on Mission Street.

B. Existing Site Features and Description

The Project Site is on a sloping site with the high point at the northwest corner of the property at approximate elevation of 74, and the low point at the southeast corner of the property at approximate elevation of 50. The resulting slope between the high point and low point is approximately 9.2%. The existing use of the property is a one-story commercial building with parking on the roof, as well as a surface parking lot along the north side of the property and an access roadway around the existing building from C Street to Fifth Avenue.

There are existing utilities in Fifth Avenue and C Street that will be able to serve the existing Project Site.

A geotechnical investigation will be performed for the proposed project and will include a review of on-site soils, and design recommendations. The geotechnical investigation will likely reveal the site is underlain by clay and silt with variable amounts of organic material. This soil type has a very low infiltration rate.

C. Opportunities and Constraints for Stormwater Control

Treatment of stormwater runoff from the Project Site is to be provided. The total post-project impervious surface area will be approximately 25,261 square feet. However, this project does not require stormwater management facilities that provide hydrograph modification benefits because the project will not be creating or replacing more than one acre of impervious surfacing. Instead, treatment of stormwater runoff from the roof of the Project Site will be provided by a single bioretention facility located on the Podium level. Treatment of stormwater runoff from the Podium level will be provided by a Contech Mechanical Stormfilter Unit, or equal, at the ground level. An on-site underground storm drain pipe will collect the treated stormwater runoff from the project bioretention facility and mechanical stormfilter unit and convey the runoff to an existing 18" storm drain in Fifth Avenue.

Disposal of runoff to deep infiltration is not feasible on this site due to the low permeability of the clay soils.

III. LOW IMPACT DEVELOPMENT DESIGN STRATEGIES

A. Optimization of Site Layout

1. Limitation of development envelope. The Project Site is bounded on 3 sides by public streets. There is an existing three-story residential building northeast of the project site and a one-story commercial building southeast of the project site. Both buildings are situated along the common property line.

2. Preservation of natural drainage features. The Project Site does not have any natural drainage features to preserve. Currently, the Project Site features overland flow from the north (high) part of the subject property at Mission Street down to the south (low) part of the subject property along Fifth Avenue. There is an existing 18" underground storm drain in Fifth Avenue which will be utilized to collect the treated storm water runoff from the proposed project.

3. Setbacks from creeks, wetlands, and riparian habitats. There are no wetlands or riparian habitats on the subject parcel.

4. Minimization of Imperviousness. The proposed total impervious area (including roofs and concrete podium walkways is 25,261 square feet or 89% of the 28,341 square feet of the subject parcel. The thirteen-story architectural design allows the project to maximize the number of residential units on the Project Site.

5. Use of drainage as a design element. The project design and grading set out to maximize the total area that receives stormwater treatment.

B. Use of Permeable Pavements

Due to the geotechnical and soil constraints listed above, permeable pavements will not be incorporated into the Project Site.

C. Dispersal of Runoff to Pervious Areas

No stormwater runoff from impervious areas will be directed to pervious areas of the Project Site.

D. Stormwater Control Measures

This project will seek to direct all impervious and pervious roof surfaces to the single bioretention facility on the Podium level. All the impervious and pervious Podium surfaces will be directed to the mechanical stormfilter unit at the ground floor.

IV. DOCUMENTATION OF DRAINAGE DESIGN

A. Descriptions of each Drainage Management Area

1. Table of Drainage Management Areas

DMA Name	*Surface Type*	*Area (square feet)*
DMA-1	*Roof*	*17,800*
DMA-2	*Roof Landscaping*	*802*
DMA-3	*Roof Swimming Pool*	*925*
DMA-4	*Podium walkways*	*5,368*
DMA-5	*Podium Landscaping*	*488*
DMA-6	*Miscellaneous pavement areas*	*2,093*

2. Drainage Management Area Descriptions

DMA-1: Totaling 17,800 square feet. This area includes the impervious portion of the roof surface. DMA-1 drains to Facility 1, a bioretention facility located on the Podium floor.

DMA-2: Totaling 802 square feet. This area includes the pervious portion of the roof level, located in landscape planters. DMA-2 drains to Facility 1, a bioretention facility located on the Podium floor.

DMA-3: Totaling 925 square feet. This area includes the swimming pool at the roof level. For purposes of this stormwater control plan, this area is deemed self-treating.

DMA-4: Totaling 5,368 square feet. This area includes the impervious portion of the Podium surface. DMA-4 will collect stormwater runoff in podium level area drains and be directed to the mechanical stormfilter unit at the ground floor.

DMA-5: Totaling 488 square feet. This area includes the pervious portion of the Podium level, located in landscape planters. DMA-5 will collect stormwater runoff in podium level landscape planters and be directed to the mechanical stormfilter unit at the ground floor

DMA-6: Totaling 2,093 square feet. This area includes the miscellaneous impervious portion of the ground floor, open to the sky. DMA-6 will collect stormwater runoff in ground floor area drains and be directed to the mechanical stormfilter unit at the ground floor.

B. Tabulation and Sizing Calculations

1. Information Summary for Bioretention Facility Design

Total Project Area	28,341 square feet
DMA-1	17,800 square feet
DMA-2	802 square feet

2. Self-Treating Areas

DMA-3	925 square feet
DMA-4	5,368 square feet
DMA-5	488 square feet
DMA-6	2,093 square feet

3. Areas Draining to Bioretention Facilities

DMA Name	*DMA Area (s.f.)*	*Post-project surface type*	*DMA Runoff factor*	*DMA Area × runoff factor*	*Stormwater Facility*			
					Facility #1			
DMA-1	*17,800*	*Roof*	*1.0*	*17,800*				
DMA-2	*802*	*Landscape*	*0.1*	*80*	*IMP Sizing factor*		*Minimum Facility Size*	*Proposed Facility Size*
			Total	***17,880***	***0.04***		***715***	***865***

V. SOURCE CONTROL MEASURES

A. Site Activities and potential sources of pollutants

The following activities planned for the project have potential to allow pollutants to enter runoff:

1) On-site drain inlets
2) Refuse disposal
3) Landscape maintenance
4) Fertilizers and pesticides used in landscaping area

To further reduce the potential to enter runoff, permanent and operational BMP's will be implemented as described in the following Table.

B. Source Control Table

Potential source of runoff pollutants	*Permanent source control BMPs*	*Operational source control BMPs*
On-site drain inlets	Inlets that could be accessed from paved areas, sidewalks and landscaped areas will be marked with a "No Dumping – Drains to Bay	• Inlet markings will be inspected annually and replaced or renewed as needed • Owners will receive stormwater pollution prevention information to be provided by the County • Bioretention and related structures and features will be inspected and maintained as specified in the BMP Operation and Maintenance Plan
Refuse areas	All dumpsters will be marked with a "Do not dump Hazardous Materials here" or similar	• Adequate litter receptacles will be provided throughout the project site • Groundskeeping crew or contractor will inspect and clean up daily. Spills will be cleaned up using dry methods
Landscaping/outdoor pesticide use	• Landscaping will be designed to minimize required irrigation and runoff, to promote surface infiltration, and to minimize the use of fertilizers and pesticides that can contribute to storm water pollution • Plants will be selected appropriate to site soils, slopes, climate, sun, wind, rain, land use, air movement, ecological consistency, and plant management • Plantings for swales will be selected to be appropriate to anticipated soil and moisture conditions	• All site landscaping is to be maintained by a professional landscaping contractor. Contract to state that landscaping is to be maintained using IPM principles, with minimal or no use of pesticides • Owners will receive integrated pest management information

C. Features, Materials, and Methods of Construction of Source Control BMP's

VI. STORM WATER FACILITY MAINTENANCE

A. Ownership and Responsibility for Maintenance in Perpetuity

All stormwater treatment facilities in this plan will be owned and maintained in perpetuity by the private owner of the subject property. The applicant accepts responsibility for interim operation and maintenance of the facilities until such time as this responsibility is formally transferred to the owner.

The property owner is required to provide a Stormwater Control Operation and Maintenance (O&M) Plan for review of the City of San Rafael, and record an Operation and Maintenance Agreement, including and necessary

rights-of-way, prior to issuance of a building permit. Additionally, the property owner will be required to annex into any financing mechanisms formed to ensure that all costs associated with the perpetual Operation & Maintenance, administration and reporting of these water quality features (including costs associated with all required City of San Rafael administration and reporting) are paid for by the property owner.

B. Summary of Maintenance Requirements for each Stormwater Facility

Bioretention and related facilities remove pollutants primarily by filtering runoff slowly through an active layer of soil. Routine maintenance is needed to ensure that flow is unobstructed, that erosion is prevented, and that soils are held together by plant roots and are biologically active. Typical routine maintenance consists of the following:

1) Inspect inlets, exposure of soils, or other evidence of erosion. Clear any obstructions and remove any accumulations of sediment. Examine rock or other material used as a splash pad and replenish if necessary.

2) Inspect outlets for erosion or plugging.

3) Examine the vegetation to insure that it is healthy and dense enough to provide filtering and to protect soils from erosion. Replenish mulch as necessary, remove fallen leaves and debris, prune large shrubs or trees, and mow turf areas. Confirm that irrigation is adequate and not excessive. Replace dead plants and remove invasive vegetation.

4) Observe soil at the bottom of the bioretention planter or filter for uniform percolation throughout. If portions of the swale or filter do not drain within 48 hours after the end of the storm, the soil should be tilled and replanted. Remove any debris or accumulations of sediment.

5) Abate any potential vectors by filling in the ground and around swale and by ensuring that there are no areas where water stands longer than 48 hours following a storm. If mosquito larvae are present and persistent contact the County Vector Control District for information and advice. Mosquito larvicides should be applied only when absolutely necessary and then only by a licensed individual or contractor.

VII. CONSTRUCTION CHECKLIST

STORMWATER CONTROL PLAN REFERENCE	SOURCE CONTROL OR TREATMENT CONTROL MEASURE	PLAN SHEET NUMBER
Stormwater Quality Plan & Bioretention Facility Detail	Vegetated Flow-Through Planter Bioswale Detail	Civil Sheets C1.4 & C1.5
Source Control Table V.B.	On-site drain inlets to be marked With "no dumping" message	Stormwater Control Plan
Source Control Table V.B.	Plant selection to minimize irrigation, minimize use of fertilizers and pesticides, and for pest resistance.	Landscape Plans
Source Control Table V.B.	Adequate litter receptacles throughout project area	Architectural Plans

VIII. OWNER'S CERTIFICATION

The selection, sizing, and preliminary design of stormwater treatment and other stormwater pollution control measures in this plan are in accordance with the current edition of the BASMAA Post-Construction Manual.

Provision E.12 Sizing Calculator

See the instructions and the BASMAA Post-Construction Manual

Step 1: Enter Total Site Area	**Step 2:** List names of all DMAs and square footage of each	**Step 3:** If DMA is "Self-Treating" or "Self-Retaining," **copy** square footage to appropriate column	**Step 4:** If the DMA is "Drains to Self Retaining" or "Drains to Bioretention" enter runoff factor from Table 4-1

Step 6: For "Drains to Self-Retaining" DMAs, enter the **name of receiving DMA**	**Step 5:** Slide (move) number from this column to correct column (F or H-Q)

Version 0.3. 2015-12-02.

Total Site Area: 28341

DMA Names	Square Feet	Self-Treating	Self-Retaining	Runoff Factor	Drains to Self-Retaining	Name of Receiving DMA	BIORETENTION FACILITIES									
							Facility 1	Facility 2	Facility 3	Facility 4	Facility 5	Facility 6	Facility 7	Facility 8	Facility 9	Facility 10
DMA-1	17800			1		BIO #1	17800									
DMA-2	802	802		0.1		BIO #1	67									
DMA-3	925	925														
DMA-4	5368	5368														
DMA-5	488	488														
DMA-6	2093	2093														
DMA-7																
DMA-8																
DMA-9																
DMA-10																
DMA-11																
DMA-12																
DMA-13																
DMA-14																
DMA-15																
DMA-16																
DMA-17																
DMA-18																
DMA-19																
DMA-20																
Total DMAs	27476	9676	0		0		17867	0	0	0	0	0	0	0	0	0
						Sizing Factor	**0.04**	**0.04**	**0.04**	**0.04**	**0.04**	**0.04**	**0.04**	**0.04**	**0.04**	**0.04**
						Minimum Size	714.68	0	0	0	0	0	0	0	0	0
Total Facilities	865	**Step 7:** Enter Facility Footprints				**Footprint on Exhibit**	865									
DMAs + Facilities	28341						OK	OK	OK	OK	OK	OK	OK	OK	OK	OK
	OK	**Step 8:** Iterate sizes of facility footprints and DMAs until all footprints are at least the minimum **AND** DMAs + Facilities equals Total Site Area														

Step 9: Check to make sure Areas Draining to each Receiving Self-Retaining Area do not exceed maximum 2:1 ratio.

Step 10: Check results on this spreadsheet are consistent with what is shown on the SCP Exhibit.