APPENDIX I
NOISE STUDY

Planned Development General Plan Amendment, Planned Development Zoning Code Amendment & Alexan Foothills Specific Plan

Noise Impact Analysis

March 2019

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Appendix A: Technical Noise Data

List of Acronyms, Abbreviations, and Symbols	
Acronym / Abbreviation	**Full Phrase or Description**
ADT	Average Daily Traffic
Caltrans	California Department of Transportation
CEQA	California Environmental Quality Act
CNEL	Community Noise Equivalent Level
dB	Decibel
dBA	Decibels, A-Weighted
dBV / VdB	Velocity Decibels
Ldn / DNL	Day-Night Noise Level
EIR	Environmental Impact Report
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
GPA	General Plan Amendment
HVAC	Heating, Ventilation, and Air Conditioning
HUD	Department of Housing and Urban Development
Hz	Hertz
Leq	Average / Equivalent Noise Level
Lmax	Maximum Noise Level
Lmin	Minimum Noise Level
LT	Long Term (noise measurement)
METRO	Los Angeles County Metropolitan Transportation Authority
OITC	Outdoor/Indoor Transmission Class
PPV	Peak Particle Velocity
ROW	Right of Way
SEL_{ref}	Source Reference Level
ST	Short Term (noise measurement)
STC	Sound Transmission Class
TIA	Traffic Impact Analysis
ZCA	Zoning Code Amendment

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1 INTRODUCTION

This report presents the environmental noise assessment for the proposed Planned Development General Plan Amendment (PD GPA) and Planned Development Zoning Code Amendment (PD ZCA), as well as the proposed 6.77-acre Alexan Foothills Specific Plan within a portion of the area proposed for the PD GPA and PD ZCA in Monrovia, California. The Project area, which comprises the entire area proposed for the PD GPA and PD ZCA, comprises one City block on approximately 9.63 acres (Figure 1-1 and Figure 1-2). The City block is bounded by West Evergreen Avenue to the north, South Magnolia Avenue to the east, South Mayflower Avenue to the west, and the METRO Gold Line to the south. The 6.77-acre Alexan Foothills Specific Plan area is depicted in Figure 1-3. The Specific Plan would allow a 436-unit, five-story apartment complex and an eight-level (seven stories) parking structure, containing 797 stalls.

MIG, Inc. (MIG) prepared this Noise Impact Assessment Report (Report) at the request of Trammell Crow Residential. This Report evaluates the potential construction- and operations-related noise impacts of the proposed Project using Project-specific information provided by Trammel Crow Residential. Where necessary, MIG has supplemented available information with standardized sources of information, such as model assumptions pertaining to construction equipment activity levels. In general, this Report evaluates the potential "worst-case" conditions associated with the proposed Project's construction and operational noise levels to ensure a conservative (i.e., likely to overestimate) assessment of potential noise impacts is presented.

This Report is intended for use by the Lead Agency to assess the potential noise and vibration impacts of the proposed Project in compliance with the California Environmental Quality Act (CEQA; PRC §21000 et seq.) and the State CEQA Guidelines (14 CCR §15000 et seq.), particularly in respect to the noise and vibration issues identified in Appendix G of the State CEQA Guidelines. This report does not make determinations of significance pursuant to CEQA because such determinations are solely the purview of the Lead Agency.

1.1 REPORT ORGANIZATION

This Report is organized as follows:

- **Chapter 1, Introduction,** explains the contents of this Report and its intended use.
- **Chapter 2, Noise Fundamentals,** provides pertinent background information on the measurement, propagation, and characterization of noise levels.
- **Chapter 3, Environmental setting,** describes the existing noise setting of the proposed Project.
- **Chapter 4, Regulatory setting,** provides information on the federal, state, and local regulations that govern the proposed Project's noise setting and potential noise impacts.
- **Chapter 5, Proposed Project Description**, provides an overview of construction and operational activities associated with the proposed Project.
- **Chapter 6, Impact Assessment,** identifies the potential construction and operational noise impacts of the proposed Project and evaluates these effects in accordance with Appendix G of the State CEQA Guidelines.
- **Chapter 7, Report Preparers and References** list the individuals involved, and the references used, in the preparation of this Report.

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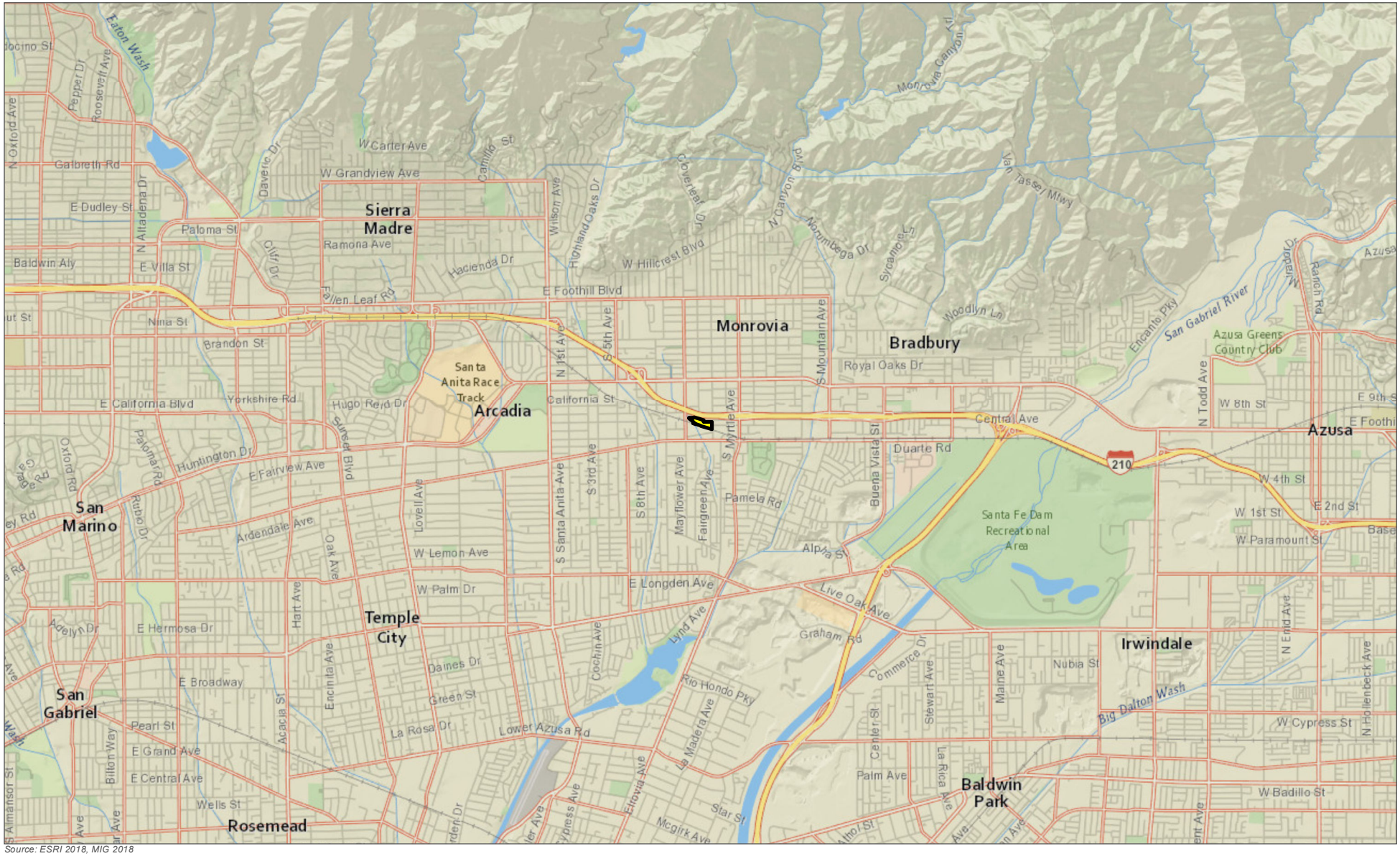

Source: ESRI 2018, MIG 2018

Figure 1 Regional Location Map

Trammel Crow Project Site, Monrovia, CA

MIG

Source: ©2019 Google

Project Area

Figure 2 Aerial View of Project Area

Trammell Crow Project Site, Monrovia, CA

Legend:

Yellow screened parcels comprise the Alexan Foothills Specific Plan area.
All other parcels between West Evergreen Avenue, South Magnolia Avenue, South Mayflower Avenue and the METRO Gold Line (outlined in blue without the yellow shading) comprise the GP/ZCA area.

Figure 3 Project Area Map

Trammel Crow Project Site, Monrovia, CA

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2 NOISE FUNDAMENTALS

2.1 FUNDAMENTALS OF ENVIRONMENTAL ACOUSTICS

"Noise is generally defined as unwanted sound and widely recognized as a form of environmental degradation. Airborne sound is the rapid fluctuation of air pressure above and below atmospheric pressure. The frequency (pitch), amplitude (intensity or loudness), and duration of a sound all contribute to the effect on a listener, or receptor, and whether or not the receptor perceives the sound as "noisy" or annoying.

Pitch is the height or depth of a tone or sound and depends on the frequency of the vibrations by which it is produced. Sound frequency is expressed in terms of cycles per second, or Hertz (Hz). Humans generally hear sounds with frequencies between 20 and 20,000 Hz and perceive higher frequency sounds, or high pitch noise, as louder than low-frequency sound or sounds low in pitch. Sound intensity or loudness is a function of the amplitude of the pressure wave generated by a noise source combined with the reception characteristics of the human ear. Atmospheric factors and obstructions between the noise source and receptor also affect the loudness perceived by the receptor. Sound pressure levels are typically expressed on a logarithmic scale in terms of decibels (dB). A dB is a unit of measurement that indicates the relative amplitude (i.e., intensity or loudness) of a sound, with 0 dB corresponding roughly to the threshold of hearing for the healthy, unimpaired human ear.

Sound levels in decibels are calculated on a logarithmic basis. An increase of 10 dBs represents a ten-fold increase in acoustic energy, while 20 dBs is 100 times more intense, 30 dBs is 1,000 times more intense, etc. In general, there is a relationship between the subjective noisiness or loudness of a sound and its intensity, with each 10 dB increase in sound level perceived as approximately a doubling of loudness. Due to the logarithmic basis, decibels cannot be directly added or subtracted together using common arithmetic operations:.

$$50\ decibels + 50\ decibels\ \neq 100\ decibels$$

Instead, the combined sound level from two or more sources must be combined logarithmically. For example, if one noise source produces a sound power level of 50 dBA, two of the same sources would combine to produce 53 dB as shown below.

$$10 * \ 10\ log\left(10^{\left(\frac{50}{10}\right)} + \ 10^{\left(\frac{50}{10}\right)}\right) = 53\ decibels$$

In general, when one source is 10 dB higher than another source, the quieter source does not add to the sound levels produced by the louder source because the louder source contains ten times more sound energy than the quieter source.

2.1.1 Sound Characterization

Although humans generally can hear sounds with frequencies between 20 and 20,000 Hz, most of the sounds humans are normally exposed to do not consist of a single frequency, but rather a broad range of frequencies perceived differently by the human ear. In general, humans are most sensitive to the frequency range of 1,000–8,000 Hz and perceive sounds within that range better than sounds of the same amplitude in higher or lower frequencies. Instruments used to measure sound, therefore, include an electrical filter that enables the instrument's detectors to replicate human hearing. This filter, known as the "A-weighting" or "A-weighted sound level" filters low and very high frequencies, giving greater weight to the

frequencies of sound to which the human ear is typically most sensitive. Most environmental measurements are reported in dBA, meaning decibels on the A-scale. See Table 2-1 for a list common noise sources and their A-weighted noise levels.

Sound levels are usually not steady and vary over time. Therefore, a method for describing either the average character of the sound or the statistical behavior of the variations over a period of time is necessary. The continuous equivalent noise level (Leq) descriptor is used to represent the average character of the sound over a period of time. The Leq represents the level of steady-state noise that would have the same acoustical energy as the sum of the time-varying noise measured over a given time period. Leq is useful for evaluating shorter time periods over the course of a day. The most common Leq averaging period is hourly, but Leq can describe any series of noise events over a given time period.

Variable noise levels are the values that are exceeded for a portion of the measured time period. Thus, the L1, L10, L50, and L90 descriptors represent the sound levels exceeded 1%, 10%, 50%, and 90% of the time the measurement was performed. The L90 value usually corresponds to the background sound level at the measurement location.

When considering environmental noise, it is important to account for the different responses people have to daytime and nighttime noise. During the nighttime, background noise levels are generally quieter than during the daytime but also more noticeable due to the fact that household noise has decreased as people begin to retire and sleep. Noise exposure over the course of an entire day is described by the day/night average sound level, DNL (or Ldn), and the community noise equivalent level, or CNEL, descriptors. Both descriptors represent the 24-hour noise exposure in a community or area. For DNL, the 24-hour day is divided into a 15-hour daytime period (7 AM to 10 PM) and a 9-hour nighttime period (10 PM to 7 AM) and a 10 dB “penalty” is added to measure nighttime noise levels when calculating the 24-hour average noise level. For example, a 45 dBA nighttime sound level would contribute as much to the overall day-night average as a 55 dBA daytime sound level. The CNEL descriptor is similar to Ldn, except that it includes an additional 5 dBA penalty for noise events that occur during the evening time period (7 PM to 10 PM). The artificial penalties imposed during DNL and CNEL calculations are intended to account for a receptor’s increased sensitivity to noise levels during quieter nighttime periods.

Table 2-1: Typical Outdoor and Indoor Noise Levels		
Common Outdoor Activities	**Noise Level (dBA)**	**Common Indoor Activities**
	-110-	Rock Band
Jet flyover at 1,000 feet		
	-100-	
Gas lawn mower at 3 feet		
	-90-	
Diesel truck at 50 feet at 50 mph		Food blender at 3 feet
	-80-	Garbage disposal at 3 feet
Noise urban area, daytime		
Gas lawnmower, 100 feet	-70-	Vacuum cleaner at 10 feet
Commercial area		Normal speech at 3 feet
Heavy traffic at 300 feet	-60-	
		Large business office
Quiet urban daytime	-50-	Dishwasher next room
Quite urban nighttime	-40-	Theater, large conference room (background)
Quiet suburban nighttime		
	-30-	Library
Quite rural nighttime		Bedroom at night
	-20-	
		Broadcast/recording studio
	-10-	
Typical threshold of human hearing	-0-	Typical threshold of human hearing
Source: Caltrans 2013a		

2.1.2 Sound Propagation

The energy contained in a sound pressure wave dissipates and is absorbed by the surrounding environment as the sound wave spreads out and travels away from the noise generating source. The strength of the source is often characterized by its "sound power level." Sound power level is independent of the distance a receiver is from the source and is a property of the source alone. Knowing the sound power level of an idealized source and its distance from a receiver, the sound pressure level at a specific point (e.g., a property line or a receiver) can be calculated based on geometrical spreading and attenuation (noise reduction) as a result of distance and environmental factors, such as ground cover (asphalt vs. grass or trees), atmospheric absorption, and shielding by terrain or barriers.

For an ideal "point" source of sound, such as mechanical equipment, the energy contained in a sound pressure wave dissipates and is absorbed by the surrounding environment as the sound wave spreads out in a spherical pattern and travels away from the point source. Theoretically, the sound level

attenuates, or decreases, by 6 dB with each doubling of distance from the point source. In contrast, a "line" source of sound, such as roadway traffic or a rail line, spreads out in a cylindrical pattern and theoretically attenuates by 3 dB with each doubling of distance from the line source; however, the sound level at a receptor location can be modified further by additional factors. The first is the presence of a reflecting plane such as the ground. For hard ground, a reflecting plane typically increases A weighted sound pressure levels by 3 dB. If some of the reflected sound is absorbed by the surface, this increase will be less than 3 dB. Other factors affecting the predicted sound pressure level are often lumped together into a term called "excess attenuation." Excess attenuation is the amount of additional attenuation that occurs beyond simple spherical or cylindrical spreading. For sound propagation outdoors, there is almost always excess attenuation, producing lower levels than what would be predicted by spherical or cylindrical spreading. Some examples include attenuation by sound absorption in air; attenuation by barriers; attenuation by rain, sleet, snow, or fog; attenuation by grass, shrubbery, and trees; and attenuation from shadow zones created by wind and temperature gradients. Under certain meteorological conditions, like fog and low-level clouds, some of these excess attenuation mechanisms are reduced or eliminated due to noise reflection.

2.1.3 Noise Effects

Noise effects on human beings are generally categorized as:

- Subjective effects of annoyance, nuisance, and/or dissatisfaction;
- Interference with activities such as speech, sleep, learning, or relaxing; or
- Physiological effects such as startling and hearing loss.

Most environmental noise levels produce subjective or interference effects; physiological effects are usually limited to high noise environments, such as industrial manufacturing facilities or airports.

Predicting the subjective and interference effects of noise is difficult due to the wide variation in individual thresholds of annoyance and past experiences with noise; however, an accepted method to determine a person's subjective reaction to a new noise source is to compare it to the existing environment without the noise source, or the "ambient" noise environment. In general, the more a new noise source exceeds the ambient noise level, the more likely it is to be considered annoying and to disturb normal activities.

Under controlled conditions in an acoustical laboratory, the trained, healthy human ear is able to discern 1-dB changes in sound levels when exposed to steady, single-frequency ("pure-tone") signals in the mid-frequency (1,000–8,000 Hz) range. In typical noisy environments, changes in noise of 1 to 2 dB are generally not perceptible. However, it is widely accepted that people are able to begin to detect sound level increases of 3 dB in typical noisy environments. Further, a 5 dB increase is generally perceived as a distinctly noticeable increase, and a 10 dB increase is generally perceived as a doubling of loudness that would almost certainly cause an adverse response from community noise receptors.

2.2 GROUNDBORNE VIBRATION AND NOISE

Vibration is the movement of particles within a medium or object such as the ground or a building. Vibration may be caused by natural phenomena (e.g., earthquakes, volcanic eruptions, sea waves, landslides) or humans (e.g., explosions, machinery, traffic, trains, construction equipment). Vibration sources are usually characterized as continuous, such as factory machinery, or transient, such as explosions.

As is the case with airborne sound, groundborne vibrations may be described by amplitude and frequency; however, unlike airborne sound, there is no standard way of measuring and reporting amplitude. Vibration amplitudes can be expressed in terms of velocity (inches per second) or discussed in dB units in order to compress the range of numbers required to describe vibration. Vibration impacts to buildings are usually discussed in terms of peak particle velocity (PPV) in inches per second (in/sec). PPV represents the maximum instantaneous positive or negative peak of a vibration signal and is most appropriate for evaluating the potential for building damage. Vibration can also be measured in vibration velocity levels or velocity decibels (Vdb).

Vibration can impact people, structures, and sensitive equipment. The primary concern related to vibration and people is the potential to annoy those working and residing in the area. Vibration with high enough amplitudes can damage structures (such as crack plaster or destroy windows). Ground-borne vibration can also disrupt the use of sensitive medical and scientific instruments, such as electron microscopes.

Common sources of vibration within communities include construction activities and railroads. Ground-borne vibration generated by construction projects is usually highest during pile driving, rock blasting, soil compacting, jack hammering, and demolition-related activities. Next to pile driving, grading activity has the greatest potential for vibration impacts if large bulldozers, large trucks, or other heavy equipment are used.

2.2.1 Existing Noise and Vibration Environment

Located in the southern part of the City of Monrovia, the Project area is generally configured in an east-west orientation and is bounded by South Magnolia Avenue to the east, South Mayflower Avenue to the west, Evergreen Avenue and Interstate-210 (I-210, or the Foothill Freeway) to the north, and the METRO Gold Line light rail to the south. The Project area consists mostly of a mix of light industrial and commercial land uses, although five residential units are present in the Project area. In general, medium and high density residential development borders the Project area, across Magnolia Avenue, Mayflower Avenue, and the METRO Gold Line.

The Project is adjacent to the City's Station Square Transit Village, and the Gold Line Monrovia Station is located less than 500 feet east of the Project (addressed at 1641 South Primrose Avenue). Several transit-oriented, multi-family developments are planned for the near future (e.g., the Station Square South project, located adjacent to the Project, across South Magnolia Avenue and South of the Gold Line). The closest airport to the Project is the San Gabriel Valley Airport, located approximately 3.7 miles southwest of the Project.

The General Plan Noise Element identifies traffic noise on major arterial streets and the I-210 as the most pervasive source of noise in certain areas of the City. The General Plan specifically notes that residential areas south of I-210 are impacted by freeway noise. The eastbound segment of I-210 includes an approximately 12-foot high wall that terminates on the eastern side of South Mayflower Avenue; a similar wall begins 200 feet west of South Magnolia Avenue. For the most part the segment of I-210 directly adjacent to the Project (i.e., between South Mayflower and South Magnolia Avenue) does not contain a sound wall. This portion of the I-210 is elevated, approximately 20 feet above the Project area.

The General Plan Noise Element was prepared in 2002, before the METRO Gold Line began operation, and does not identify potential noise levels associated with Gold Line operation; however, the Gold Line Foothill Extension Pasadena to Montclair Final Environmental Impact Report predicted the following noise levels for eastbound and westbound light rail service at residential receptors in the City:

- Eastbound Gold Line noise levels south of the right of way (ROW) were predicted to be 72 DNL or less within approximately 40 feet of the eastbound track, 65 DNL or less within approximately 50 feet of the eastbound track, and less than 60 DNL approximately 100 feet of the eastbound track (Metro Gold Line Foothill Extension Construction Authority [MGLFECA] 2007, Table 3-11.6).
- Westbound Gold Line noise levels north of the ROW were predicted to be 71 DNL or less within approximately 40 feet of the westbound track, 68 DNL or less within approximately 60 feet of the westbound track, and less than 60 DNL approximately 100 feet of the eastbound track (MGLFECA 2007, Table 3-11.6).

The City's 2008 General Plan Land Use Policy 6.1 requires that new residences proposed near the I-210 and METRO railroad tracks are designed to reduce the intrusion of sound into the dwellings.

The existing ambient noise and vibration environment at and near the Project area is described in more detail below.

2.2.2 Measured Ambient Noise Levels

The existing ambient noise levels in the Project area were monitored in June 2018 (MIG 2019; see Appendix I). Ambient noise levels were measured with two Larson Davis SoundTrack LxT Type 1 sound level meters; ambient noise measurements were collected in 10-minute intervals. Conditions during the monitoring were generally clear and sunny during the daytime, with a daily high of approximately 90 degrees Fahrenheit and winds from the west/southwest between approximately five to 10 miles per hour.

The ambient noise monitoring conducted for this EIR included five short-term (ST) and two long-term (LT) measurements at locations selected to:

- Provide direct observations of existing noise sources at and in the vicinity of the Project;
- Determine typical ambient noise levels at and in the vicinity of the Project; and
- Evaluate potential Project noise levels at nearby sensitive receptors (see Noise Sensitive Receptors below).

The ambient noise monitoring locations are described below and shown in Figure 3-1.

- **Location ST-1** was at the intersection of South Magnolia Avenue and the METRO Gold Line, at the southeast corner of the Project area. The ambient noise levels measured at location ST-1 are considered representative of background daytime noise levels associated with local commercial land uses in the area, the METRO Gold Line, and traffic on South Magnolia Avenue.
- **Location ST-2** was at the intersection of South Magnolia Avenue and West Evergreen Avenue, at the northeast corner of the Project area. The ambient noise levels measured at location ST-2 are considered representative of background daytime noise levels associated with the local commercial and other lands uses in the area, as well as traffic noise levels associated with I-210.
- **Location ST-3** was at the intersection of South Mayflower Avenue and West Evergreen Avenue, at the northwest corner of the Project area. The ambient noise levels measured at location ST-3 are considered representative of background daytime noise levels associated with the local commercial and other land uses in the area, as well as traffic noise levels associated with I-210.
- **Location ST-4** was at the intersection of South Mayflower Avenue and the METRO Gold Line, at the southwest corner of the Project area. The ambient noise levels measured at location ST-4 are considered representative of background daytime noise levels associated with the local residential land uses in the area, the METRO Gold Line, and traffic on South Mayflower Avenue.

- **Location ST-5** was on Evergreen Avenue, approximately 100 feet east of Mayflower Avenue. The ambient noise levels measured at location ST-5 are considered representative of background daytime noise levels associated with the local commercial and other land uses in the area, as well as traffic noise levels associated with I-210.
- **Location LT-1** was on Evergreen Avenue, approximately 205 feet west of South Magnolia Avenue. The ambient noise levels measured at location LT-1 are considered representative of 24-hour ambient noise exposure levels in the northern half of the Project area.
- **Location LT-2** was adjacent to the METRO Gold Line, approximately 215 feet west of South Magnolia Avenue (as measured along the METRO right-of-way [ROW]). The ambient noise levels measured at location LT-2 are considered representative of 24-hour ambient noise exposure levels in the southern half of the Project area.

Based on observations made during the ambient noise monitoring, the existing noise environment in the Project vicinity consists primarily of transportation noise sources, particularly vehicular traffic on I-210 and rail activity on the METRO Gold Line. Table 3-1 summarizes the results of the ambient noise monitoring conducted for this EIR.

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3 ENVIRONMENTAL SETTING

3.1 PROJECT LOCATION AND SITE DESCRIPTION

This report presents the environmental noise assessment for the proposed General Plan and Zoning Code Amendment (PD GPA and PD ZCA) and proposed Alexan Foothills Specific Plan within a portion of the area proposed for the GP/ZCA in Monrovia, California. The Project area, which comprises the entire area proposed for the PD GPA and PD ZCA, comprises one City block on approximately 9.6 acres (Figure 1-1 and Figure 1-2). The City block is bounded by West Evergreen Avenue to the north, South Magnolia Avenue to the east, South Mayflower Avenue to the west, and the METRO Gold Line to the south. The 6.77-acre Alexan Foothills Specific Plan area is depicted in Figure 1-3. The Specific Plan would allow a 436-unit, five-story apartment complex and an eight-level (seven stories) parking structure, containing 797 stalls. The area outside of the Specific Plan Area totals approximately 2.83 acres and would allow for the development of approximately 82 dwelling units in the future.

3.2 EXISTING NOISE AND VIBRATION ENVIRONMENT

Located Located in the southern part of the City of Monrovia, the Project area is generally configured in an east-west orientation and is bounded by South Magnolia Avenue to the east, South Mayflower Avenue to the west, Evergreen Avenue and Interstate-210 (I-210, or the Foothill Freeway) to the north, and the METRO Gold Line light rail to the south. The Project area consists mostly of a mix of light industrial and commercial land uses, although five residential units are present in the Project area. In general, medium and high density residential development borders the Project area, across Magnolia Avenue, Mayflower Avenue, and the METRO Gold Line.

The Project is adjacent to the City's Station Square Transit Village, and the Gold Line Monrovia Station is located less than 500 feet east of the Project (addressed at 1641 South Primrose Avenue). Several transit-oriented, multi-family developments are planned for the near future (e.g., the Station Square South project, located adjacent to the Project, across South Magnolia Avenue and South of the Gold Line). The closest airport to the Project is the San Gabriel Valley Airport, located approximately 3.7 miles southwest of the Project.

The General Plan Noise Element identifies traffic noise on major arterial streets and the I-210 as the most pervasive source of noise in certain areas of the City. The General Plan specifically notes that residential areas south of I-210 are impacted by freeway noise. The eastbound segment of I-210 includes an approximately 12-foot high wall that terminates on the eastern side of South Mayflower Avenue; a similar wall begins 200 feet west of South Magnolia Avenue. For the most part the segment of I-210 directly adjacent to the Project (i.e., between South Mayflower and South Magnolia Avenue) does not contain a sound wall. This portion of the I-210 is elevated, approximately 20 feet above the Project area.

The General Plan Noise Element was prepared in 2002, before the METRO Gold Line began operation, and does not identify potential noise levels associated with Gold Line operation; however, the Gold Line Foothill Extension Pasadena to Montclair Final Environmental Impact Report predicted the following noise levels for eastbound and westbound light rail service at residential receptors in the City:

- Eastbound Gold Line noise levels south of the right of way (ROW) were predicted to be 72 DNL or less within approximately 40 feet of the eastbound track, 65 DNL or less within approximately 50 feet of the eastbound track, and less than 60 DNL approximately 100 feet of the eastbound track (Metro Gold Line Foothill Extension Construction Authority [MGLFECA] 2007, Table 3-11.6).

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The City's 2008 General Plan Land Use Policy 6.1 requires that new residences proposed near the I-210 and METRO railroad tracks are designed to reduce the intrusion of sound into the dwellings.

The existing ambient noise and vibration environment at and near the Project area is described in more detail below.

3.2.1 Existing Ambient Noise Levels

The existing ambient noise levels in the Project area were monitored in June 2018 (MIG 2019; see Appendix A). Ambient noise levels were measured with two Larson Davis SoundTrack LxT Type 1 sound level meters; ambient noise measurements were collected in 10-minute intervals. Conditions during the monitoring were generally clear and sunny during the daytime, with a daily high of approximately 90 degrees Fahrenheit and winds from the west/southwest between approximately five to 10 miles per hour.

The ambient noise monitoring conducted for this Report included five short-term (ST) and two long-term (LT) measurements at locations selected to:

- Provide direct observations of existing noise sources at and in the vicinity of the Project;
- Determine typical ambient noise levels at and in the vicinity of the Project; and
- Evaluate potential Project noise levels at nearby sensitive receptors (see Noise Sensitive Receptors below).

The ambient noise monitoring location are described below and shown in Figure 3-1.

- **Location ST-1** was at the intersection of South Magnolia Avenue and the METRO Gold Line, at the southeast corner of the Project area. The ambient noise levels measured at location ST-1 are considered representative of background daytime noise levels associated with local commercial land uses in the area, the METRO Gold Line, and traffic on South Magnolia Avenue.
- **Location ST-2** was at the intersection of South Magnolia Avenue and West Evergreen Avenue, at the northeast corner of the Project area. The ambient noise levels measured at location ST-2 are considered representative of background daytime noise levels associated with the local commercial and other lands uses in the area, as well as traffic noise levels associated with I-210.
- **Location ST-3** was at the intersection of South Mayflower Avenue and West Evergreen Avenue, at the northwest corner of the Project area. The ambient noise levels measured at location ST-3 are considered representative of background daytime noise levels associated with the local commercial and other land uses in the area, as well as traffic noise levels associated with I-210.
- **Location ST-4** was at the intersection of South Mayflower Avenue and the METRO Gold Line, at the southwest corner of the Project area. The ambient noise levels measured at location ST-4 are considered representative of background daytime noise levels associated with the local residential land uses in the area, the METRO Gold Line, and traffic on South Mayflower Avenue.

- **Location ST-5** was on Evergreen Avenue, approximately 100 feet east of Mayflower Avenue. The ambient noise levels measured at location ST-5 are considered representative of background daytime noise levels associated with the local commercial and other land uses in the area, as well as traffic noise levels associated with I-210.
- **Location LT-1** was on Evergreen Avenue, approximately 205 feet west of South Magnolia Avenue. The ambient noise levels measured at location LT-1 are considered representative of 24-hour ambient noise exposure levels in the northern half of the Project area.
- **Location LT-2** was adjacent to the METRO Gold Line, approximately 215 feet west of South Magnolia Avenue (as measured along the METRO right-of-way [ROW]). The ambient noise levels measured at location LT-2 are considered representative of 24-hour ambient noise exposure levels in the southern half of the Project area.

Based on observations made during the ambient noise monitoring, the existing noise environment in the Project vicinity consists primarily of transportation noise sources, particularly vehicular traffic on I-210 and rail activity on the METRO Gold Line. Table 3-1 summarizes the results of the ambient noise monitoring conducted. Please refer to Appendix A for detailed ambient noise monitoring results and data sheets.

Table 3-1: Existing Ambient Noise Levels at the Project Area (dBA)

Monitoring Site	Duration	Lmin	Lmax	Leq Range			CNEL
				Daytime (7 AM – 7 PM)	Evening (7 PM – 10 PM)	Nightime (10 PM – 7 AM)	
ST-1	30 Minutes	49.7	87.9	63.7 - 70.3	--	--	--
ST-2	30 Minutes	60.3	79.4	66.2 - 77.4	--	--	--
ST-3	30 Minutes	57.9	86.7	67.8 - 68.7	--	--	--
ST-4	30 Minutes	53.5	94.4	67.5 - 73.9	--	--	--
ST-5	20 Minutes	61.1	78.2	66.5 - 66.9	--	--	--
LT-1	24-Hours	47.8	92.3	64.3 - 70.3	67.0 - 73.1	62.1 - 70.0	73.5
LT-2	24-Hours	39.2	93.5	68.9 - 73.5	68.2 - 71.8	61.6 - 71.5	75.1

Source: MIG, 2018 (See Appendix A.)

3.2.2 Existing METRO Gold Line Noise and Vibration Levels

The Project area is located adjacent to the METRO Gold Line. Rail-related noise comes from several potential sources. A locomotive engine's propulsion system generates noise from mechanical and electrical systems. The interaction of wheels with the track produces various noises, particularly where the wheel encounters a flaw or defect along smooth wheel / track surfaces. Finally, train horn or bells and railroad crossing warning devices generate short but loud alerts pursuant to federal safety regulations.

The METRO Gold Line is a commuter rail line with eastbound and westbound service at the Monrovia Station every 7 to 14 minutes Monday through Friday. Peak hourly weekday activity occurs during the AM and PM commuter periods when 9 eastbound and westbound trains can occur in an hour; typical service involves 4 to 5 eastbound and westbound trains per hour. During the weekday, service runs nearly 20 hours a day. Weekend service also runs nearly 24 hours a day, with 3 to 5 eastbound and westbound trains per hour. The METRO Gold Line crosses South Magnolia and South Mayflower Avenue at grade, with guards and warning bells provided for safety.

During the ambient noise monitoring, noise levels associated with the METRO Gold Line were observed to be in the range of 69 to 94 dB while passing at distance of approximately 5 to 20 feet from the center of the westbound track. The higher noise levels were associated with longer light rail trains (4 cars instead of 3 cars) accelerating westbound from the Monrovia Station.

Vibration monitoring was not conducted specifically for the Project; however, vibration monitoring was conducted in January 2018 for the Initial Study/Mitigated Negative Declaration for the adjacent South Station Square project (City of Monrovia 2018). The vibration monitoring for the South Station Square project was conducted approximately 525 feet from the Project, at a distance of 20 feet from the track centerline. The results of this monitoring indicate vibration levels generated by the existing METRO Gold Line are less than 0.002 PPV and 61 velocity decibels (VdB) (a measure of the vibration velocity level).

3.3 NOISE-SENSITIVE RECEPTORS

Noise sensitive receptors are buildings or areas where unwanted sound or increases in sound may have an adverse effect on people or land uses. Residential areas, motels and hotels, hospitals and health care facilities, school facilities, and parks are examples of noise receptors that could be sensitive to changes in existing environmental noise levels. Table 3-2 summarizes the noise sensitive receptors in proximity of the proposed boundary of the Alexan Specific Plan as well as the boundary of ZCA Areas A and C.

Table 3-2: Sensitive Receptor Locations

Receptor	Land Use	Direction / Location	Distance From	
			Alexan Foothills Specific Plan	ZCA Areas A and C(A)
R-1A	Single-Family Residential	East; along S. Magnolia Ave, W. Evergreen Ave, and Pomona Ave	60 ft	60ft
R-1B	Multi-Family Residential			
R-2	Multi-Family Residential	South; across the METRO Gold Line ROW (accessed via S. Mayflower Ave and Genoa St)	70 ft	70 ft
R-3	Single-Family Residential	West; along Diamond Street and the western portion of S. Mayflower Ave	260 ft	80 ft
R-4	Single-Family Residential	West; along the eastern portion of S. Mayflower Ave	70 ft	--(B)

Source: MIG 2019

(A) ZCA Areas A and C are comprised of a western portion (Parcels 4, 5, 6, 9, 14, and 15).

(B) There is no distance reported because R-4 is located within ZCA Areas A and C..

In addition, once constructed and occupied, the residential receptors associated within the Alexan Foothills Specific Plan would represent new sensitive noise receptors. However, the nearest receptor locations to each Project component are shown in Table 3-2.

Figure 4 Ambient Noise Measurement Locations

Trammel Crow Project Site, Monrovia, CA

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4 REGULATORY SETTING

4.1 FEDERAL NOISE REGULATIONS

4.1.1 Federal Transit Administration

Noise and Vibration Impact Assessment document sets ground-borne vibration annoyance criteria for general assessments. The criteria vary by the type of building being subjected to the vibrations, and the overall number of vibration events occurring each day. Category 1 buildings are considered buildings where vibration would interfere with operation, even at levels that are below human detection. These include buildings with sensitive equipment, such as research facilities and hospitals. Category 2 buildings include residential lands and buildings were people sleep, such as hotels and hospitals. Category 3 buildings consist of institutional land uses with primary daytime uses. The FTA standards vary for "frequent" events (occurring more than 70 times per day such as a rapid transit project), "occasional" events (occurring between 30 to 70 times per day) and "infrequent" events (occurring less than 30 times per day). The FTA's vibration annoyance criteria are summarized in Table 4-1.

Table 4-1: FTA Ground-Borne Vibration Impact Criteria for General Assessment

Vibration Land Use Category/Type	Frequent Events	Occasional Events	Infrequent Events
Category 1 – Buildings with sensitive equipment	65 VdB	65 VdB	65 VdB
Category 2 – Buildings where people sleep	72 VdB	75 VdB	80 VdB
Category 3 – Institutional buildings	75 VdB	78 VdB	83 VdB

Source: FTA 2006
Note: VdB = Velocity decibel

4.2 STATE NOISE REGULATIONS

4.2.1 California Building Standards Code

The California Building Standards Code is contained in Title 24 of the California Code of Regulations and consists of 11 different parts that set various construction and building requirements. Part 2, California Building Code, Section 1207, Sound Transmission, establishes sound transmission standards for interior walls, partitions, and floor/ceiling assemblies. Specifically, Section 1207.4 establishes that interior noise levels attributable to exterior noise sources shall not exceed 45 dBA DNL or CNEL (as set by the local General Plan) in any habitable room.

The California Green Building Standards Code is Part 11 to the California Building Standards Code. Relevant sections of Chapter 5, Nonresidential Mandatory Standards are noted below:

- Section 5.507.4.1.1 sets forth that buildings exposed to a noise level of 65 dB Leq (1-hour) during any hour of operation shall have exterior wall and roof-ceiling assemblies exposed to the noise source meeting a composting sound transmission class (STC) rating of at least 45 (or an outdoor indoor transmission class (OITC) of 35, with exterior windows of a minimum STC of 40.
- Section 5.507.4.2 sets forth that wall and roof assemblies for buildings exposed to a 65 dBA Leq pursuant to Section 5.507.4.1.1, shall be constructed to provide an interior noise environment

attributable to exterior sources that does not exceed 50 dBA Leq in occupied areas during any hour of operation. This requirement shall be documented by preparing an acoustical analysis documenting interior sound levels prepared by personnel approved by the architect or engineer of record.

4.2.2 CEQA

CEQA requires lead agencies to consider noise impacts. Under CEQA, lead agencies are directed to assess conformance to locally established noise standards or other agencies' noise standards; measure and identify the potentially significant exposure of people to or generation of excessive noise levels; measure and identify potentially significant permanent or temporary increase in ambient noise levels; and measure and identify potentially significant impacts associated with air traffic.

4.2.3 Caltrans

The California Department of Transportation's (Caltrans) Transportation and Construction Vibration Guidance Manual provides a summary of vibration criteria that have been reported by researchers, organizations, and governmental agencies (Caltrans 2013). Chapters Six and Seven of this manual summarize vibration detection and annoyance criteria from various agencies and provide Caltrans' recommended guidelines and thresholds for evaluating potential vibration impacts on buildings and humans from transportation and construction projects. These thresholds are summarized in Table 4-2 and Table 4-3.

Table 4-2: Caltrans' Vibration Threshold Criteria for Building Damage

Structural Integrity	Maximum PPV (in/sec)	
	Transient	Continuous
Extremely fragile buildings, ruins, monuments	0.12	0.08
Fragile buildings	0.2	0.1
Historic and some older buildings	0.50	0.25
Older residential structures	0.50	0.30
New residential structures	1.00	0.50
Modern industrial and commercial structures	2.00	0.50

Source: Caltrans,2013b
Note: PPV = peak particle velocity

Table 4-3: Caltrans' Vibration Threshold Criteria for Human Response		
Human Response	**Maximum PPV (in/sec)**	
	Transient	**Continuous**
Barely perceptible	0.035	0.012
Distinctly perceptible	0.24	0.035
Strongly perceptible	0.90	0.10
Severely perceptible	2.00	0.40
Source: Caltrans,2013b Note: PPV = peak particle velocity		

4.3 COUNTY NOISE REGULATIONS

Section 12.08.560 of the Los Angeles County Noise Control Ordinance limits vibration levels from a source to other properties of 0.01 in/sec PPV.

4.4 LOCAL NOISE REGULATIONS

The City of Monrovia General Plan and Municipal Code establish standards related to noise and vibration control.

4.4.1 City of Monrovia General Plan Noise Element

The City of Monrovia Noise Element includes several noise control programs designed to protect the City's residents from the adverse effects of uncontrolled noise by controlling noise at its source, as well as attenuating noise between the source and the receiver. The General Plan includes the following noise control programs that are relevant to the Project:

- Program No. 1: The City will continue to implement and enforce the City of Monrovia's noise ordinance for the control of unnecessary and unwanted noises. The ordinance should be enforced by the Building and Planning Department and the Police Department. The noise ordinance enforcement program should be provided with the necessary funding and expertise to ensure its effective enforcement.
- Program No. 2: The City will extend the California Building Code (California Code of Regulations, Title 24, Part 2, Appendix Chapter 12) requirements for noise mitigation in the design and construction of new multi-family residential developments, hotels, motels, dormitories, and apartment houses to include all types of residential developments. The regulations state: "Interior noise levels attributable to exterior sources shall not exceed 45 dB in any habitable room. The noise metric shall be either ... Ldn or ... CNEL, consistent with the noise element of the general plan." Additionally, an acoustical design analysis shall be required of any planned residential building or structure which is to be located where the exterior CNEL or Ldn exceed 60 dB. The residential design should be such that the interior living spaces are exposed to an Ldn or CNEL of no more than 45 dB. This may be accomplished by implementing a combination of the following:

    1. A reduction of the exterior noise to which the dwelling is exposed.
    2. Installing sound rated window suitable for the noise reduction required.

3. Configuring and insulating exterior wall and roofing systems to reduce the interior noise to acceptable levels.
4. Locating (or eliminating) vents, mail slots, etc., to minimize sound propagation into the home.
5. Installing forced air ventilation as needed to provide a habitable living space if the interior Ldn or CNEL level is to be met with all or some windows closed.

- **Program No. 3:** The City may implement a noise zoning code, defining compatible land usage requirements based on the guidelines of Figure 2. The City would require an analysis of whether or not the proposed development would be in compliance with this code. If the development falls in the CNEL or Ldn range above that indicated for the normally acceptable category, noise control design steps must be included in the project plans.
- **Program No. 6:** Future projects within the City will reflect a consciousness on the part of the City regarding the reduction of unnecessary noise near noise-sensitive areas such as residences, schools, parks, hospitals, libraries, and convalescent homes. Actions that can be taken to implement this program can include:
    1. Maintain liaison with transportation agencies such as Caltrans and the FHWA regarding the reduction of noise from existing facilities. The design and location of new facilities will also be considered.
    2. Consideration should be given to buffering noise-sensitive areas from noise-generating land uses.
    3. Noise monitoring within the City will be an ongoing process conducted by the appropriate departments.
    4. Ensure that the segment of the Pasadena Blue Line Extension project that would go through the City of Monrovia will be designed to meet FTA and other relevant noise criteria; close attention shall be paid to the potential adverse noise effects on residences and other noise sensitive receptors located in the vicinity of the proposed Blue Line station near the Myrtle Avenue / Duarte Road intersection, as well along the transit route.
    5. Close attention shall be paid to the noise evaluation in environmental assessments, environmental impact reports and environmental impact statements.

Regarding Noise Control Program No. 3, the land use compatibility guidelines referenced in the 2002 General Plan Noise Element are reproduced in Table 4-4; however, the City has not adopted nor incorporated land use noise compatibility standards into its zoning code.

Table 4-4: General Plan Land Use Compatibility Guidelines				
Land Use Category	**Community Noise Equivalent Level (in dBA, CNEL)**			
	Normally Acceptable	**Conditionally Acceptable**	**Normally Unacceptable**	**Clearly Unacceptable**
Residential – Low Density Single Family, Duplex, Mobile homes	≤ 60	≤ 70	≤ 75	> 75
Residential – Multi Family	≤ 65	≤ 70	≤ 75	> 75
Transient Lodging – Motels, Hotels	≤ 65	≤ 70	≤ 80	> 80
Schools, Libraries, Churches, Hospitals, Nursing Homes	≤ 70	≤ 70	≤ 80	> 80
Auditoriums, Concert Halls, Amphitheaters	--	≤ 65	--	> 80
Sports Arenas, Outdoor Spectator Sports	--	≤ 70	--	> 70
Playground, Neighborhood Parks	≤ 70	--	≤ 75	> 75
Golf Course, Riding Stables, Water Recreation, Cemeteries	≤ 75	--	≤ 80	> 80
Office Buildings, Business Commercial and Professional	≤ 70	≤ 77.5	> 77.5	--
Industrial, Manufacturing, Utilities, Agriculture	≤ 75	≤ 80	> 80	--
Land Use Compatibility Interpretation:				
Normally Acceptable:	*Specific land use is satisfactory based upon the assumption 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 analyses of noise reduction requirements is made and needed noise insulation features 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 be generally discouraged. If new construction or development does proceed, a detailed analysis of noise reduction requirements must be made and needed noise insulation features included in the design.*			
Clearly Unacceptable:	*New development should generally not be undertaken.*			

Source: City of Monrovia General Plan Noise Element

4.4.2 City of Monrovia Municipal Code

The City's existing Municipal Code regulates unnecessary, excessive, and annoying noise and vibration generated by certain sources of noise. The City's code is intended to maintain quiet residential areas that exhibit low noise levels, and to implement programs that reduce noise in residential areas where noise levels are above acceptable values.

Existing Municipal Code Title 9, Public Peace, Morals, and Safety, Chapter 9.44, Noise, includes the following standards related to noise:

- **Section 9.44.030, General Prohibition,** sets forth that it is unlawful for any person to willfully generate any loud, unnecessary, or unusual noise which unreasonably disturbs the peace and quiet of any neighborhood or which causes any discomfort or annoyance to any reasonable person of normal sensitivity, given factors such as the volume, intensity, nature, duration, and timing of the noise.
- **Section 9.44.040, Allowable Noise Levels**, sets forth that no person shall create or allow the creation of noise on any residential property which causes the noise level to exceed the actual

measured median ambient noise level, or the following presumed ambient noise level, whichever is greater:

- During the daytime (7 AM to 9 PM), the allowable noise level is 55 dBA
- During the nighttime (9 PM to 7 AM), the allowable noise level is 50 dBA

If the intruding noise source is continuous and cannot be reasonably discontinued for sufficient time in which the ambient noise level can be determined, the presumed ambient noise level shall be used.

- **Section 9.44.060, Permitted Increases in Noise Levels,** sets forth that increase in the allowable noise levels described above are permitted as follows:
  - A 5 dBA increase is permitted for 15 minutes per hour
  - A 10 dBA increase is permitted for 5 minutes per hour
  - A 15 dBA increase is permitted for 1 minute per hour
  - A 20 dBA increase is permitted for less than one minute per hour.
- **Section 9.44.080, Exemptions**, sets forth that the following activities are exempt from the noise control provisions of the City's Municipal Code:
  - Emergency sounds
  - Noise generating activities made while performing governmental duties
  - Noise generating activities conducted on public playgrounds and public or private school grounds
  - The handling of boxes, crates, containers, garbage cans, or other similar objects between the hours of 7 AM and 7 PM
  - The operation of mechanically powered saws, drills, grinders, lawn or garden tool, or similar tool between 7 AM and 7 PM Monday to Friday and 10 AM and 10 PM on weekends and holidays
  - Construction or demolition work conducted between the hours of 7 AM and 7 PM Monday to Friday and 9 AM and 6 PM on weekends and holidays
- **Section 9.44.090, Radios, Television Sets, and Similar Devices**, sets forth that it is unlawful for any person within any residential zone to use or operate any radio, musical instrument, stereo system, entertainment system, television set, or other machine or device for producing or reproducing sound between the hours of 10 PM and 7 AM in a manner that disturbs the peace, quiet, and comfort of neighboring residents or any reasonable person of normal sensitivity residing in the area.

Existing Municipal Code Title 17, Zoning, Chapter 17.32, Performance Standards, includes the following standards related to noise and vibration:

- **Section 17.32.040, Noises**, sets forth that the maximum sound level radiated by any use of facility, when measured at the boundary line of the property on which the sound is generated, shall not be obnoxious by reason of its intensity, pitch or dynamic characteristics, as determined by the City.

- **Section 17.32.040, Vibration**, sets forth that no vibration shall be permitted which causes a noticeable tremor beyond the boundary line of the property upon which the vibration exists.

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5 PROPOSED PROJECT DESCRIPTION

The City of Monrovia (City) is proposing a new Planned Development (PD), Planned Development 27 (PD-27), Station Square West, within a 9.63-acre Project area. Within this area, a Planned Development General Plan Amendment (PD GPA) and Planned Development Zoning Code Amendment (PD ZCA) are proposed, as well as a proposed 6.77-acre Alexan Foothills Specific Plan (Specific Plan) within a portion of the area proposed for the GP/ZCA.

The City is in the San Gabriel Valley region of Los Angeles County. The Project area comprises one City block on approximately 9.63 acres. The block is bounded by West Evergreen Avenue to the north, South Magnolia Avenue to the east, South Mayflower Avenue to the west, and the METRO Gold Line light rail to the south. The Project area is located primarily within an urbanized industrial area.

General Plan Amendment

The GPA area encompasses the entire Project area. Current land uses within the 9.63-acre GPA area include a mix of residential, industrial, and institutional uses, which are described in more detail below under the ZCA area heading.

Zoning Code Amendment

The ZCA area encompasses the same 9.63 acres as the GPA area and involves establishment of new Planned Development 27. The Project area is currently developed with a mix of light industrial (approximately 70,750 square feet) and warehouse (approximately 10,120 square feet) uses with five single-family residences, an institutional place of worship (approximately 6,630 square feet), and an office. The Project area also contains private surface parking throughout the area and two cellular towers. Three areas have been defined with the ZCA area, referred to as Areas A, B, and C (Figure 3-3), which are described as follows:

- Area “A” encompasses 2.30 acres in the western portion of the Project area where there is a mix of residential and commercial/industrial buildings;
- Area “B” encompasses the middle 6.77-acre portion (the Alexan Foothills Specific Plan area). This area is developed with three light industrial structures, one residential unit, the institutional place of worship and associated trailers, the commercial office building, and one asphalt covered storage lot, all constructed between 1942 and 1987. The following parcels are within the Alexan Foothills Specific Plan boundaries (Assessor Parcel Numbers [APNs] 8507-006-016, -022, -024, -035, -041, -042, -043, and -044); and
- Area “C” encompasses the 0.56-acre northeastern portion of the Project area and is developed with three commercial/industrial buildings.

Alexan Foothills Specific Plan

The Alexan Foothills Specific Plan would allow a 436-unit, five-story apartment complex and an eight-level (seven stories) parking structure, containing 798 stalls. The apartment complex would include two pools and several tenant amenity courtyards. The Magnolia Avenue street frontage proposes a two-story lobby, fitness room, and four live-work units, all with apartments above. Three outdoor/rooftop amenity decks are planned on top of the apartment complex’s fourth level; two rooftop decks face the San Gabriel Mountains to the north, and the other faces west. Other tenant amenities include a pet spa, bike “kitchen” (i.e., bicycle repair area), tenant lounge, centralized mail/package delivery room, and a golf simulation room. No offsite improvements to utilities are proposed under the Specific Plan.

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6 NOISE IMPACT ANALYSIS

This chapter describes potential impacts related to noise and vibration that could result from the proposed Project. The chapter also recommends mitigation measures as needed to reduce significant impacts.

6.1 THRESHOLDS OF SIGNIFICANCE

Based on the CEQA Guidelines, Appendix G: Items XIII (a) through (c), implementation of the Project would have a significant impact related to noise and vibration if it would:

- Generate a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in:
    - The City of Monrovia Municipal Code Title 9, Public Peace, Morals, and Safety, Chapter 9.44, Noise; or
    - The City of Monrovia Municipal Code Title 17, Zoning, Chapter 17.31, Performance Standards; or
    - The City of Monrovia General Plan Noise Element; or
    - Other potentially applicable state or agency standards.
- Generate excessive ground vibration or ground-borne noise levels.
- 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 expose people residing or working in the project area to excessive noise levels.

For the purposes of this Report, the proposed Project would result in a substantial permanent increase in ambient noise levels if it would:

- Cause the Ldn at an adjacent land use to increase by 5.0 dBA or more where noise levels would remain below the land use compatibility guidelines referenced in the 2002 General Plan Noise Element (reproduced in Table 4-4); or
- Cause the Ldn at an adjacent land use to increase by 3.0 dBA or more where noise levels would equal or exceed the land use compatibility guidelines referenced in the 2002 General Plan Noise Element (reproduced in Table 4-4).

For the purposes of this Report, the proposed Project would result in a substantial temporary or periodic noise impact if it would:

- Result in a 10 dB or greater increase in hourly noise levels above ambient conditions for two or more hours per day, five days a week, for a period of 12 months or more.

For temporary construction noise, the City considers construction activities resulting in a 10 dB increase in hourly noise levels above ambient conditions to be a temporary and substantial increase in noise levels, provided this increase occurs for two or more hours a day, five days a week, for more than 12 months. A 10 dB increase above existing ambient conditions is typically perceived as a “doubling” of loudness, which in limited doses would not be substantial. Prolonged exposure to project-specific construction noise levels that are twice as loud as the ambient environmental level in which the receiver is

accustomed to, however, would be considered substantial, even if such noise levels occur on a temporary basis.

6.2 ENVIRONMENTAL IMPACTS

6.2.1 Noise and Land Use Compatibility / Compliance with Applicable Standards

The Project would result in the placement of new, noise-sensitive, residential land uses in close proximity to the I-210 and METRO Gold Line. The following analysis evaluates if new residential receptors in the Project area would be exposed to noise levels that exceed City standards. The analysis also evaluates if the new residential developments would generate noise levels that could exceed City standards.

Exposure to Noise Levels that Exceed Standards

As shown earlier in Table 3-1, the Project area is subject to high ambient noise levels that are primarily associated with traffic noise from I-210 and rail noise from the METRO Gold Line. Measures daytime and nighttime hourly noise levels were generally above 65 dBA Leq (as measured at the Project area boundary) and did not fluctuate significantly, indicating noise levels associated with the I-120 and the METRO Gold Line are consistent throughout the daytime and nighttime period.

The calculated CNEL (at the Project area boundary) adjacent to the I-210 and METRO Gold Line is 73.5 and 75.1 CNEL, respectively (Table 3-1). Although these noise levels represent existing conditions, they are not expected to change substantially in the future since traffic volumes on I-210 are already substantial and the METRO Gold Line currently operates with a high level of frequency.

Alexan Foothills Specific Plan Noise Exposure

The current conceptual site plan for the Alexan Foothills Specific Plan includes a number of design features that would reduce noise levels at exterior building facades and corresponding interior noise levels, including:

- Building setbacks of at least 20 feet or more from the edge of the West Evergreen and METRO Gold Line ROWs.
- Building orientation that limits exterior residential wall exposure to direct noise from the I-210 and the METRO Gold Line. The current conceptual site plan shows 27 units with exterior wall exposure to the I-210 (plus one exterior roof deck) and 45 units with exterior wall exposure to the METRO Gold Line. Thus, only 16% of the total available units would be subject to the worst-case noise levels at the site.
- Residential unit design that places bedrooms on the interior of the unit and less sensitive spaces (kitchens, closets, etc.) along the exterior wall facing the I-210 and METRO Gold Line ROW.
- Use of outdoor recreation space and the proposed parking garage to buffer residential units from noise associated with the I-210 and the METRO Gold Line. Higher noise levels are generally acceptable in outdoor recreation spaces due to the shorter exposure period (i.e., non-continuous, short-term exposure) and the fact that outdoor activities are typically less sensitive to the subjective and interference effects of noise (e.g., annoyance, nuisance, interference with sleep or speech).

- Incorporation of a vegetated screening wall along the southern property line to limit line of sight / direct observation of METRO Gold trains.

With building setbacks, the CNEL at exterior building facades for the Alexan Foothills Specific Plan would likely be in the range of 71 to 72 CNEL in the northern and southern parts of the Alexan Foothills Specific Plan area. Exterior noise levels at proposed Courtyard #3 and the secondary recreation courtyard would not exceed 70 dB CNEL.

ZCA Areas A and C Noise Exposure

The ZCA would allow for development of multi-family land use(s) in ZCA Areas A and C that would likely be similar to the proposed Alexan Foothills Specific Plan area (i.e., a multi-story residential development); however, no specific development is proposed at this time. Since building setbacks would be similar to those proposed for the Alexan Foothills Specific Plan, future residential buildings within the ZCA Areas A and C would likely be exposed to similar noise levels as the Alexan Foothills Specific Plan (72 to 74 CNEL in the northern and southern parts of the Project area, respectively).

Impact Significance Determination

Based on the ambient noise measurements performed for the Project, potential residential units within the Project area that front West Evergreen Avenue and the I-210 would be exposed to noise levels of approximately 72 CNEL, while potential residential units that front the METRO Gold Line ROW would be exposed to noise levels of approximately 74 CNEL.

Ambient noise levels greater than 70 dB CNEL in the Project area exceed the levels at which the California Building Standards Code, California Green Building Standards Code, and the General Plan require the preparation of an acoustical analysis documenting compliance with applicable interior noise standards of 45 CNEL in any habitable room (pursuant to the Section 1207.4 of the California Building Code, Part 2, Volume 1) and 50 dBA Leq (1-hour) for any occupied room (pursuant to Section 5.507.4.2 of the California Green Building Standards Code)[1].

Standard construction techniques and materials are commonly accepted to provide a minimum exterior to interior noise attenuation (i.e., reduction) of 22 to 25 dBA with all windows and doors closed, which would result in interior noise levels of approximately 47 to 50 CNEL dBA for units fronting I-210 and approximately 49 to 52 CNEL for units fronting the METRO Gold Line ROW[2]. Since interior noise levels

[1] Part 2 of the California Building Code, Section 1207, Sound Transmission, establishes sound transmission standards for interior walls, partitions, and floor/ceiling assemblies. Specifically, Section 1207.4 establishes that interior noise levels attributable to exterior noise sources shall not exceed 45 dBA DNL or CNEL (as set by the local General Plan) in any habitable room. Chapter 5 of the California Green Building Standards Code, Section 5.507 sets forth environmental comfort/acoustical control requirements for building assemblies that are prescriptive- based (i.e., assemblies meet certain prescribed exterior to interior noise attenuation levels) or performance-based (i.e., the interior noise environment shall not exceed 50 dBA on an hourly equivalent noise level basis in occupied areas. Both the prescriptive and performance standard contained in the Green Building Standards Code apply to projects located within a 65 CNEL noise contour of an airport, freeway, railroad, industrial source, etc. or otherwise exposed to a noise level of 65 dBA on an hourly Leq basis.

2 The U.S. Department of Housing and Urban Development (HUD) Noise Guidebook and supplement (2009a, 2009b) includes information on noise attenuation provided by building materials and different construction techniques. As a reference, a standard exterior wall consisting of 5/8-inch siding, wall sheathing, fiberglass insulation, two by four wall studs on 16-inch centers, and 1/2-inch gypsum wall board with single strength windows provides approximately 35 dBs of attenuation between exterior and interior noise levels. This reduction may be

would continue to exceed applicable City and State standards, this is considered a potentially significant impact.

To ensure potential interior noise levels meet applicable standards, the City shall require all development proposals in the Project area, including the Alexan Foothills Specific Plan, to implement mitigation measure MM NOI-1, which requires the preparation of an acoustical analysis to document compliance with interior noise level requirements. Mitigation measure MM NOI-1 would ensure applicable exterior and interior noise standards are met by new development within the Project area. Thus, this measure would ensure that buildout of the Project would not expose people to noise levels that exceed standards and impacts would be reduced to a less than significant level.

Mitigation Measures

Mitigation measure MM NOI-1 is applicable to the Alexan Foothills Specific Plan and future developments within ZCA Areas A and C.

Mitigation Measure NOI-1: Prior to the issuance of a building permit for any development in the Project area, the City shall review and approve an acoustical analysis, prepared by or on behalf of the applicant, and based on the final design, that:

1. Identifies the exterior noise levels at the:
    a. Exterior building facades that face West Evergreen Avenue/I-210, South Magnolia Avenue, and the METRO Gold Line ROW; and
    b. Exterior recreation areas, including patios, that face and have a line of sight to West Evergreen Avenue/I-210, South Magnolia Avenue, and the METRO Gold Line ROW.
2. Identifies the final site and building design features that would:
    a. Attenuate exterior building façade noise levels to interior levels that do not exceed 45 CNEL in habitable rooms and 50 dBA Leq (1-hour) in other occupied rooms. Potential noise insulation site and building design features capable of achieving this requirement may include, but are not limited to:
        i. Sound barriers;
        ii. Enhanced exterior wall construction/noise insulation design;
        iii. Use of enhanced window, door, and roof assemblies with above average sound transmission class (STC) or outdoor/indoor transmission class (OITC) values; or
        iv. Use of mechanical, forced air ventilation systems to permit a windows closed condition in residential units.

Plan Requirements and Timing: An acoustical report shall be submitted to City Planning for review and approval prior to the issuance of building permits, documenting that actual interior and exterior noise level at the locations indicated in this measure, meet City and State standards.

Monitoring: City Planning staff shall approve the acoustical analysis prior to issuance of building permits.

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slightly lower (2-3 dBs) for traffic noise due to the specific frequencies associated with traffic noise. Increasing window space may also decrease attenuation, with a reduction of 10 dBs possible if windows occupy 30% of the exterior wall façade.

Proposed Project Generation of Noise Levels that Exceed Standards

Once constructed, the proposed Alexan Foothills Specific Plan and future development in ZCA Areas A and C would generate noise levels from increased vehicle parking activities, stationary sources of equipment such as potential heating, ventilation, and air conditioning (HVAC) equipment, and a back-up generator and fire pump. The potential noise levels generated by these activities and equipment are described below.

Alexan Foothills Specific Plan Operational Noise Generation

Parking Garage Noise. The proposed Alexan Foothills Specific Plan parking garage would increase the noise levels at the site by providing additional parking capacity, reflection of sound waves, etc. Noise sources associated with the parking garage (e.g., car horns, doors slamming, cars starting, etc.) would be intermittent. These types of noises would not differ substantially from the noise generated by existing parking activities in the Project area, but the frequency of these events would increase. Potential increases in noise resulting from the new parking garage were quantified using the following equations contained in the FTA's *Transit Noise and Vibration Impact Assessment* manual (FTA 2006).

$$\mathbf{Leq(h) = SEL_{ref} + C_N - 36.5}$$

and

$$\mathbf{C_N = 10 \times \log(N_A / 1{,}000)}$$

Where:

Leq(h)	=	Hourly Leq at 50 feet
SEL_{ref}	=	Source Reference Level at 50 feet
C_N	=	Volume Adjustment (SEL_{ref} is based on 1,000 cars in peak activity hour)
N_A	=	Number of Automobiles per Hour

To calculate the Leq and CNEL at 50 feet from the parking garage, hourly noise levels were first calculated throughout the day using the equations above, where, according to the FTA, the SELref for parking garages is 92 dBA. The AM peak hour calculations accounted for 143 hourly trips, the PM peak hour (calculations accounted for 194 hourly trips, and the remaining 1,601 trips were divided evenly throughout the remaining 22 hours in the day (i.e., approximately 73 average trips her hour). This methodology is considered conservative (i.e., likely to overestimate CNEL) since it likely overestimates activity at the parking garage from the hours of 10:00 PM to 7:00 AM, when a 10 dBA penalty is applied to the hourly noise levels used to calculate the CNEL (see Section 2.1.3).

The results of the calculation indicate the parking garage would result in a worst-case hourly Leq value of 49.3 dBA (during the PM peak hour activity) and a CNEL of 51.8, which is more than 20 dBA lower than the existing ambient noise level measured at LT-2 (75.1 CNEL). In general, when two noise levels are 10 dB or more apart, the lower value does not contribute significantly (less than 0.5 dB) to the total noise level. Thus, potential noise levels from the Alexan Foothills Specific Plan parking garage would comply with the standards contained in Municipal Code Section 9.44.040 and would not result in a substantial increase in ambient noise levels in the vicinity of the Project.

Mechanical Equipment. The proposed parking garage would be an open air structure and would not require fresh air supply or exhaust supply fans to provide ventilation throughout the garage.

Mechanical equipment associated with the Alexan Foothills Specific Plan would include pool equipment (e.g., pumps), elevators, and individual HVAC units. Pool and elevator equipment would be contained within mechanical rooms, and the HVAC units necessary to cool and ventilate residential units would be small charge/load units mounted on each rooftop and contained behind a parapet wall that would direct sound upwards. The mechanical equipment associated with the proposed Alexan Foothills Specific Plan would comply with the standards contained in Municipal Code Section 9.44.040 and would not result in a substantial increase in ambient noise levels in the vicinity of the Project.

Other Operational Noise Sources Including Stationary Noise Sources

The Alexan Foothills Specific Plan would include ground level and rooftop recreational spaces, resident amenities such as a pet spa and fitness center, refuse collection services, a 50-horsepower emergency generator, and a 50-horsepower emergency fire pump which could be tested approximately one-half hour to one-hour per month.

The Specific Plan's recreational spaces and amenities would provide residents recreation and residential services, including areas to sit, eat, and socialize. This type of anticipated activity is consistent with other land uses in the area and would not result in a substantial increase in noise levels in the immediate area.

Refuse collection services would be congregated in the center of the Specific Plan area, with collection services occurring on West Evergreen Avenue, adjacent to the I-210 and away from sensitive receptors. Thus, refuse collection services would not generate substantial noise levels at noise sensitive receptor locations.

The 50-horsepower back-up generator and 50 hp emergency fire pump would be located within designated mechanical rooms. These pieces of equipment would only be used on an intermittent emergency basis with the exception of regular testing (assumed to be one hour per month). Noise from these pieces of equipment would also be shielded by their enclosures, and therefore, would not exceed noise standards at the locations of residences.

Therefore, operational noise impacts generated by the proposed Alexan Foothills Specific Plan would be less than significant.

Mitigation Measures

No mitigation measures are required.

Operational Noise Generation in ZCA Areas A and C

Although a specific development is not proposed at this time, future development in the remaining Although a specific development is not proposed at this time, future development in ZCA Areas A and C would be likely to generate noise levels from the same type of sources as the Alexan Foothills Specific Plan. However, the overall noise generating activities in these areas would likely be approximately 80% less than that of the Alexan Foothills Specific Plan, based on potential development capacity in ZCA Areas A and C. As described above, the Alexan Foothills Specific Plan would not generate onsite noise levels that have the potential to exceed City standards or result in a substantial permanent increase in ambient noise levels. Since the ZCA would result in less noise generating activities and equipment than the Alexan Foothills Specific Plan, it would also not have the potential to generate onsite noise levels that have the potential to exceed City standards or result in a substantial permanent increase in ambient noise levels. Therefore, impacts would be less than significant.

Mitigation Measures

No mitigation measures are required.

Operational Noise Levels Associated with Entire Project

The potential for noise sources in the Alexan Foothills Specific Plan area and ZCA Areas A and C to combine is limited to two areas where the different properties would abut each other. Otherwise, residential buildings, parking garage, and other structures in the proposed development under the Alexan Foothills Specific Plan, would shield adjacent properties.

The first area would be in the northeast corner of the Project area, near the intersection of South Magnolia Avenue and West Evergreen Avenue. The noise generating activities from the Alexan Foothills Specific Plan in this area would generally be limited to low-speed vehicle noise associated with vehicles entering and exiting the development, as well as some office and commercial activities associated with the leasing office in this area. Although there is no specific development proposal for this ZCA area (Area C) at this time, because this area is currently an industrial use, sensitive receptors are not expected in this area in the future. Therefore, combined noise levels in this area could only affect receptors R-1A and R-1B, located approximately 60 feet east of the Project, across South Magnolia Avenue.

The second area would be in the interior of the Project area, where the western boundary of the Alexan Foothills Specific Plan abuts the eastern boundary of the ZCA Area A along Mayflower Avenue. The noise generating activities from the Alexan Foothills Specific Plan in this area would generally be limited to use of the secondary recreation courtyard, residential uses, and roof deck activities. Although there is no specific development proposal for ZCA Area A at this time, it is assumed that the noise generating activities from future development in this area would consist of similar noise generating activities. The combined noise levels in this area could only affect the residence located approximately 70 feet south of the Project, across the METRO Gold Line ROW (i.e., sensitive receptor location R-2; see Table 3-2).

The combined noise levels generated by the Alexan Foothills Specific Plan and future development in ZCA Areas A and C, would not be substantially different than the individual noise levels associated with each Project component. As described in Section 2.1.2, when two or more sources of equivalent noise are combined, the resulting increase in noise levels is approximately 3 dB. An increase in 3 dB is barely perceptible by humans and would not be significant. Therefore, this impact would be less than significant.

Mitigation Measures

No mitigation measures are required.

6.2.2 Substantial Permanent Increases in Ambient Noise Levels

Alexan Foothills Specific Plan and ZCA Areas A and C

The Alexan Foothills Specific Plan and other future development in ZCA Areas A and C would not generate noise levels that exceed City standards or result in a substantial permanent increase in noise at or in the Project area.

However, the Alexan Foothills Specific Plan and future development in ZCA Areas A and C would generate traffic that would be distributed onto the local roadway system, potentially increasing noise levels along travel routes. The following analysis evaluates the potential increases in traffic noise levels resulting from the Alexan Foothills Specific Plan, future development of ZCA Areas A and C, and both combined.

Caltrans considers a doubling of total traffic volume to result in a 3 dBA increase in traffic-related noise levels (Caltrans 2013a). If the Project would not result in a doubling of traffic volumes on the local roadway system, it would not result in a substantial permanent increase in traffic-related noise levels. A noise level of less than 3 dBA is typically not perceptible to the human ear in an outdoor environment.

Alexan Foothills Specific Plan Increases in Traffic Noise Levels

The TIA identifies that the Alexan Foothills Specific Plan would result in a net increase in trip generation equal to 1,938 vehicle trips (LSA 2018). Table 6-1 and Table 6-2 identify the increases in traffic noise levels attributable to the Alexan Foothills Specific Plan under existing (2018) and cumulative (2035) conditions, based on the trip distribution assumptions contained in the TIA.

Table 6-1: Alexan Foothills Specific Plan Net Change in ADT (Existing 2017)

ID	Road	Segment	Existing ADT	Existing Plus SP ADT	Percent Change
1A	Duarte Road	West of Mayflower	21,445	21,545	0.47%
1B	Duarte Road	Mayflower to Magnolia	17,531	17,531	0.00%
1C	Duarte Road	Magnolia to Myrtle	17,531	17,731	1.14%
1D	Duarte Road	East of Myrtle	10,667	10,767	0.94%
2A	**W. Evergreen Avenue**	**Mayflower to Magnolia**	**2,300**	**2,900**	**26.09%**
2B	W. Evergreen Avenue	Magnolia to Myrtle	2,500	2,700	8.00%
3A	Huntington Drive	Mayflower to Magnolia	25,299	25,499	0.79%
3B	Huntington Drive	Magnolia to Myrtle	25,29	25,399	0.40%
4A	Mayflower Avenue	North of Evergreen	15,416	15,716	1.95%
4B	Mayflower Avenue	Evergreen to Duarte	15,236	15,336	0.66%
4C	Mayflower Avenue	South of Duarte	7,200	7,200	0.00%
5A	Magnolia Avenue	Huntington to Evergreen	6,790	7,490	10.31%
5B	Magnolia Avenue	Evergreen to Duarte	6,255	6,755	7.99%
6A	Myrtle Avenue	Huntington to Central	21,331	21,531	0.94%
6B	Myrtle Avenue	Central to Duarte	19,904	19,904	0.00%
6C	Myrtle Avenue	South of Duarte	21,578	21,678	0.46%

Source: LSA 2018

Table 6-2: Alexan Foothills Specific Plan Net Change in ADT (Future 2035)

ID	Road	Segment	Future ADT	Future Plus SP ADT	Percent Change
1A	Duarte Road	West of Mayflower	23,900	24,000	0.42%
1B	Duarte Road	Mayflower to Magnolia	19,700	19,700	0.00%
1C	Duarte Road	Magnolia to Myrtle	19,800	20,000	1.01%
1D	Duarte Road	East of Myrtle	12,100	12,200	0.83%
2A	**W. Evergreen Avenue**	**Mayflower to Magnolia**	**2,500**	**3,100**	**24.00%**

Table 6-2: Alexan Foothills Specific Plan Net Change in ADT (Future 2035)					
ID	**Road**	**Segment**	**Future ADT**	**Future Plus SP ADT**	**Percent Change**
2B	W. Evergreen Avenue	Magnolia to Myrtle	2,700	2,900	7.41%
3A	Huntington Drive	Mayflower to Magnolia	28,600	28,800	0.70%
3B	Huntington Drive	Magnolia to Myrtle	28,500	28,600	0.35%
4A	Mayflower Avenue	North of Evergreen	16,900	17,200	1.78%
4B	Mayflower Avenue	Evergreen to Duarte	16,700	16,800	0.60%
4C	Mayflower Avenue	South of Duarte	7,900	7,900	0.00%
5A	Magnolia Avenue	Huntington to Evergreen	8,100	8,800	8.64%
5B	Magnolia Avenue	Evergreen to Duarte	7,700	8,200	6.49%
6A	Myrtle Avenue	Huntington to Central	24,900	25,100	0.80%
6B	Myrtle Avenue	Central to Duarte	24,000	24,000	0.00%
6C	Myrtle Avenue	South of Duarte	24,100	24,200	0.41%
Source: LSA 2018					

As shown in Table 6-1 and Table 6-2, the Alexan Foothills Specific Plan could result in up to an additional 26% increase in traffic volumes on roadways segments near the Project (West Evergreen Avenue). Since the Alexan Foothills Specific Plan would not double traffic volumes on roadways in the Project vicinity, traffic noise would not increase by 3 dBA. Therefore, this impact is less than significant.

Mitigation Measures

No mitigation measures are required.

ZCA Areas A and C Increases in Traffic Noise Levels

TThe TIA identifies that future development in the ZCA Areas A and C would result in a net increase in trip generation equal to 425 vehicle trips (LSA 2018). Table 6-3 and Table 6-4 identify the increases in traffic noise levels attributable to future development in the ZCA areas under existing (2018) and cumulative (2035) conditions, based on the trip distribution assumptions contained in the TIA.

Table 6-3: GP/ZCA Net Change in ADT (Existing 2017)					
ID	**Road**	**Segment**	**Existing ADT**	**Existing Plus GP/ZCA ADT**	**Percent Change**
1A	Duarte Road	West of Mayflower	21,445	21,545	0.47%
1B	Duarte Road	Mayflower to Magnolia	17,531	17,531	0.00%
1C	Duarte Road	Magnolia to Myrtle	17,531	17,531	0.00%
1D	Duarte Road	East of Myrtle	10,667	10,767	0.94%
2A	**W. Evergreen Avenue**	**Mayflower to Magnolia**	**2,300**	**2,400**	**4.35%**
2B	W. Evergreen Avenue	Magnolia to Myrtle	2,500	2,500	0.00%
3A	Huntington Drive	Mayflower to Magnolia	25,299	25,399	0.40%
3B	Huntington Drive	Magnolia to Myrtle	25,29	25,299	0.00%
4A	Mayflower Avenue	North of Evergreen	15,416	15,416	0.00%

Table 6-3: GP/ZCA Net Change in ADT (Existing 2017)					
ID	**Road**	**Segment**	**Existing ADT**	**Existing Plus GP/ZCA ADT**	**Percent Change**
4B	Mayflower Avenue	Evergreen to Duarte	15,236	15,236	0.00%
4C	Mayflower Avenue	South of Duarte	7,200	7,200	0.00%
5A	Magnolia Avenue	Huntington to Evergreen	6,790	6,990	2.95%
5B	Magnolia Avenue	Evergreen to Duarte	6,255	6,355	1.60%
6A	Myrtle Avenue	Huntington to Central	21,331	21,331	0.00%
6B	Myrtle Avenue	Central to Duarte	19,904	19,904	0.00%
6C	Myrtle Avenue	South of Duarte	21,578	21,578	0.00%
Source: LSA 2018					

Table 6-4: GP/ZCA Net Change in ADT (Future 2035)					
ID	**Road**	**Segment**	**Future ADT**	**Future Plus GP/ZCA ADT**	**Percent Change**
1A	Duarte Road	West of Mayflower	23,900	24,000	0.42%
1B	Duarte Road	Mayflower to Magnolia	19,700	19,700	0.00%
1C	Duarte Road	Magnolia to Myrtle	19,800	19,800	0.00%
1D	Duarte Road	East of Myrtle	12,100	12,200	0.83%
2A	**W. Evergreen Avenue**	**Mayflower to Magnolia**	**2,500**	**2,600**	**4.00%**
2B	W. Evergreen Avenue	Magnolia to Myrtle	2,700	2,700	0.00%
3A	Huntington Drive	Mayflower to Magnolia	28,600	28,700	0.35%
3B	Huntington Drive	Magnolia to Myrtle	28,500	28,500	0.00%
4A	Mayflower Avenue	North of Evergreen	16,900	16,900	0.00%
4B	Mayflower Avenue	Evergreen to Duarte	16,700	16,700	0.00%
4C	Mayflower Avenue	South of Duarte	7,900	7,900	0.00%
5A	Magnolia Avenue	Huntington to Evergreen	8,100	8,300	2.47%
5B	Magnolia Avenue	Evergreen to Duarte	7,700	7,800	1.30%
6A	Myrtle Avenue	Huntington to Central	24,900	24,900	0.00%
6B	Myrtle Avenue	Central to Duarte	24,000	24,000	0.00%
6C	Myrtle Avenue	South of Duarte	24,100	24,100	0.00%
Source: LSA 2018					

As shown in Table 6-3 and Table 6-4, ZCA Areas A and C could result in up to an additional 4.35% increase in traffic volumes on roadways segments near the Project (West Evergreen Avenue). Since potential future development in ZCA Areas A and C would not double traffic volumes on roadways in the Project vicinity, traffic noise would not increase by 3 dBA. Therefore, this impact is less than significant.

Mitigation Measures

No mitigation measures are required.

Combined Increases in Traffic Noise Levels

The TIA identifies that the Alexan Foothills Specific Plan and potential future development in ZCA Areas A and C would result in a combined net increase in trip generation equal to 2,363 vehicle trips (LSA 2018). Table 6-5 and Table 6-6 identify the increases in traffic noise levels attributable to the Alexan Foothills Specific Plan and potential future development in ZCA Areas A and C under existing (2018) and cumulative (2035) conditions, based on the trip distribution assumptions contained in the TIA.

As shown in Table 6-5 and Table 6-6, the Project could result in up to an additional 30.4% increase in traffic volumes on roadway segments near the Project (West Evergreen Avenue). Since the combined Project development would not double traffic volumes on roadways in the Project vicinity, traffic noise would not increase by 3 dBA. Therefore, this impact is less than significant.

Mitigation Measures

No mitigation measures are required.

Table 6-5: Project Net Change in ADT (Existing 2017)

ID	Road	Segment	Existing ADT	Existing Plus Project ADT	Percent Change
1A	Duarte Road	West of Mayflower	21,445	21,645	0.93%
1B	Duarte Road	Mayflower to Magnolia	17,531	17,531	0.00%
1C	Duarte Road	Magnolia to Myrtle	17,531	17,731	1.14%
1D	Duarte Road	East of Myrtle	10,667	10,867	1.87%
2A	**W. Evergreen Avenue**	**Mayflower to Magnolia**	**2,300**	**3,000**	**30.43%**
2B	W. Evergreen Avenue	Magnolia to Myrtle	2,500	2,700	8.00%
3A	Huntington Drive	Mayflower to Magnolia	25,299	25,599	1.19%
3B	Huntington Drive	Magnolia to Myrtle	25,29	25,399	0.40%
4A	Mayflower Avenue	North of Evergreen	15,416	15,716	1.95%
4B	Mayflower Avenue	Evergreen to Duarte	15,236	15,336	0.66%
4C	Mayflower Avenue	South of Duarte	7,200	7,200	0.00%
5A	Magnolia Avenue	Huntington to Evergreen	6,790	7,690	13.25%
5B	Magnolia Avenue	Evergreen to Duarte	6,255	6,855	9.59%
6A	Myrtle Avenue	Huntington to Central	21,331	21,531	0.94%
6B	Myrtle Avenue	Central to Duarte	19,904	19,904	0.00%
6C	Myrtle Avenue	South of Duarte	21,578	21,678	0.46%

Source: LSA 2018

Table 6-6: Project Net Change in ADT (Future 2035)					
ID	**Road**	**Segment**	**Future ADT**	**Future Plus Project ADT**	**Percent Change**
1A	Duarte Road	West of Mayflower	23,900	24,100	0.84%
1B	Duarte Road	Mayflower to Magnolia	19,700	19,700	0.00%
1C	Duarte Road	Magnolia to Myrtle	19,800	20,000	1.01%
1D	Duarte Road	East of Myrtle	12,100	12,300	1.65%
2A	**W. Evergreen Avenue**	**Mayflower to Magnolia**	**2,500**	**3,200**	**28.00%**
2B	W. Evergreen Avenue	Magnolia to Myrtle	2,700	2,900	7.41%
3A	Huntington Drive	Mayflower to Magnolia	28,600	28,900	1.05%
3B	Huntington Drive	Magnolia to Myrtle	28,500	28,600	0.35%
4A	Mayflower Avenue	North of Evergreen	16,900	17,200	1.78%
4B	Mayflower Avenue	Evergreen to Duarte	16,700	16,800	0.60%
4C	Mayflower Avenue	South of Duarte	7,900	7,900	0.00%
5A	Magnolia Avenue	Huntington to Evergreen	8,100	9,000	11.11%
5B	Magnolia Avenue	Evergreen to Duarte	7,700	8,300	7.79%
6A	Myrtle Avenue	Huntington to Central	24,900	25,100	0.80%
6B	Myrtle Avenue	Central to Duarte	24,000	24,000	0.00%
6C	Myrtle Avenue	South of Duarte	24,100	24,200	0.41%
Source: LSA 2018					

6.2.3 Substantial Temporary or Periodic Increases in Ambient Noise Levels

Alexan Foothills Specific Plan and ZCA Areas A and C

The construction of the Alexan Foothills Specific Plan and other future development within ZCA Areas A and C would generate a temporary and periodic increase in ambient noise levels over an approximately two-and-a-half-year period. The construction of the Alexan Foothills Specific Plan is anticipated to occur over an approximately 30-month period between 2020 and 2022, while construction of future development in ZCA Areas A and C is anticipated to occur over a 12-month period between 2021 and 2022. As a conservative approach, this EIR's analysis assumes future development of the ZCA Areas A and C would occur during the final twelve months of the Alexan Foothills Specific Plan construction schedule (i.e., construction activities in the Alexan Foothills Specific Plan and ZCA Areas A and C would occur at the same time). The following analysis first presents the estimated construction noise levels associated with the Alexan Foothills Specific Plan, then the construction noise levels associated with future development in ZCA Areas A and C, and finally the combined noise levels associated with simultaneous development of both Project components.

Demolition of existing buildings as well as erection of new structures associated with the Alexan Foothills Specific Plan and buildout within ZCA Areas A and C would require the use of heavy-duty, off-road construction equipment throughout development activities. Table 6-7 presents the noise levels associated with typical types of construction equipment that could be used during construction activities.

Alexan Foothills Specific Plan Construction Noise Levels

The Alexan Foothills Specific Plan area is generally located within the center of the overall Project area and extends to the eastern boundary of the site. Parcel 7, located in the northwestern portion of the Project area is identified as ZCA Area C.

Table 6-7: Typical Construction Equipment Noise Levels (dBA)

Equipment	Reference Noise Level at 50 Feet (Lmax)(A)	Percent Usage Factor(B)	Predicted Noise Levels (Leq) at Distance(C)					
			50 Feet	100 Feet	150 Feet	250 Feet	350 Feet	450 Feet
Bulldozer	85	40	81	75	71	67	64	62
Backhoe	80	40	76	70	66	62	59	57
Compact Roller	80	20	73	67	63	59	56	54
Concrete Mixer	85	40	81	75	71	67	64	62
Crane	85	16	77	71	67	63	60	58
Excavator	85	40	81	75	71	67	64	62
Generator	82	50	79	73	69	65	62	60
Pneumatic tools	85	50	82	76	72	68	65	63
Scraper	85	40	82	76	72	68	64	62
Delivery Truck	85	40	81	75	71	67	64	62
Vibratory Roller	80	20	73	67	63	59	56	54

Sources: Caltrans 2013a and FHWA 2010.

(A) L_{max} noise levels based on manufacturer's specifications.
(B) Usage factor refers to the amount of time the equipment produces noise over the time period.
(C) Estimate does not account for any atmospheric or ground attenuation factors. Calculated noise levels based on Caltrans, 2009: L_{eq} (hourly) = L_{max} at 50 feet – 20log (D/50) + 10log (UF), where: L_{max} = reference L_{max} from manufacturer or other source; D = distance of interest; UF = usage fraction or fraction of time period of interest equipment is in use.

Construction activities associated with buildout of the five-story residential buildings and six-story parking structure would generate a variety of noise levels from operation of different kinds of construction equipment. Day-to-day noise levels at individual locations would vary depending on the equipment staging, location of operation, where materials are being stored onsite, and access routes used to import materials. Demolition, site preparation, grading / excavation, building construction, paving, and architectural coating processes involve equipment and vehicles that are known to produce temporary but intrusive levels of noise when operated in close proximity to sensitive residential receptors, particularly if equipment operation occurs during early morning, evening, or nighttime hours.

In general, construction noise levels would be highest during site preparation, grading, and excavation phases, when large pieces of earthmoving equipment would be required. Bulldozers, excavators, and graders would likely be the largest pieces of equipment operating at the same time during these phases. As a conservative approach, it is estimated up to three such pieces of equipment could be operating concurrently near a property line for an hour or two at a time. At a distance of 50 feet, the hourly Leq noise level associated with operation of a bulldozer, excavator, and grader would be approximately 86 dBA. Table 6-8 summarizes the hourly Leq noise levels that would be generated by the operation of these three pieces of equipment at sensitive receptor locations and compares these estimated noise levels against the existing ambient noise level environment.

Table 6-8: Alexan Foothills Specific Plan: Estimated Construction Noise Levels					
Receptor	**Distance from Construction Activity**	**Noise Level (dBA)**			
		Existing Ambient	**Construction**	**With Barrier Attenuation(A)**	**Change(B)**
R-1A / 1B	60 ft	63.7(C)	84.2	--	**+20.5**
R-2	70 ft	63.7(D)	82.9	72.9	+9.2
R-3	260 ft	67.5(E)	71.8	--	+4.3
R-4	70 ft	67.5(E)	82.9	--	**+15.4**

Source: MIG 2019

(A) A permanent noise barrier is located along the southern side of the METRO Gold Line, adjacent to receptors represented by R-2. Effective noise barriers can reduce noise levels by 10 to 15 dBA. The attenuation provided by this barrier (assumed to be 10 dBA) has been factored into the estimated noise level at R-2.

(B) Per the criterion outlined in Section 6.1, a significant temporary or periodic noise impact would occur if construction activities resulted in an increase of 10 dBA Leq or more at sensitive receptor locations. Bold values indicate an increase of more than 10 dBA above the ambient level.

(C) The Leq value measured at ST-1 is considered representative of ambient conditions at receptor location R-1A and R-1B. Both ST-1 and ST-2 were taken along South Magnolia Ave, along which Receptor R-1A and R-1B are located. Between ST-1 and ST-2, ST-1 had the lowest Leq value recorded, and therefore represents a conservative indication of ambient noise levels at receptor locations east of the Project.

(D) The Leq value measured at ST-1 is considered representative of ambient conditions at the property boundaries of receptor location R-2. Measurements at ST-1, LT-1, and ST-4 were all located along the southern boundary of the Project area, adjacent to the METRO Gold Line. ST-1 had the lowest Leq value recorded, and therefore represents a conservative indication of ambient noise levels at receptor locations south of the Project.

(E) The Leq value measured at ST-4 is considered representative of ambient conditions at receptor locations R-3 and R-4. Both ST-3 and ST-4 were taken along Mayflower Ave, along which Receptors R-3 and R-4 are located. Between ST-3 and ST-4, ST-4 had the lowest Leq value recorded, and therefore represents a conservative indication of ambient noise levels at receptor locations east of the Project.

The values presented in Table 6-8 reflect conservative (i.e., worst-case), yet realistic estimate of potential hourly Leq noise levels. The above estimates assume all equipment is operating at the Project's boundary nearest the receptor location. In actuality, equipment onsite would move around the work area and would generally not be situated at the same location for more than a few hours at a time. Equipment operating further away would produce lower noise levels than those presented. Nonetheless, as shown in Table 6-8, construction activities associated with the Alexan Foothills Specific Plan are anticipated to increase hourly ambient noise levels by 10 dB or more for two or more hours per day, seven days a week, for a period of 12 months or more. This is considered a potentially significant impact.

To reduce noise levels during construction of the Alexan Foothills Specific Plan, the City would require the applicant and/or the applicant's contractors to implement mitigation measure MM NOI-2, which requires preparation of a construction noise plan and implementation of the plan to minimize noise disturbance at adjacent sensitive receptor locations, to establish designated truck routes to minimize noise disturbance associated with deliveries to the site, and to install noise barriers along the eastern and western perimeters of the Alexan Foothills Specific Plan area to reduce noise levels by a minimum of 11 dBA. These requirements would reduce construction noise levels such that sensitive receptor locations would not be exposed to noise levels in excess of 10 dBA above ambient conditions for more than year. Implementation of this measure would reduce impacts to a less than significant level.

Mitigation Measures

Mitigation measure MM NOI-2 is applicable to the Alexan Foothills Specific Plan and future developments within ZCA Areas A and C.

Mitigation Measure NOI-2: To reduce temporary construction noise impacts on adjacent land uses, the applicant or the applicant's construction contractor shall implement the following construction-period noise abatement measures for any development within the Project area:

- *Construction Activity Notification.* All residential units located within 500 feet of the construction site shall be sent a notice regarding the construction schedule for the proposed development. A sign, legible at a distance of 50 feet shall also be posted at the construction site. All notices and signs shall indicate the dates and duration of construction activities, as well as provide a telephone number where residents can enquire about the construction process and register complaints.
- *Noise Disturbance Coordinator.* A "noise disturbance coordinator" shall be established. The disturbance coordinator shall be responsible for responding to any local complaints about construction noise. The disturbance coordinator shall determine the cause of the noise complaint (e.g., starting too early, bad muffler, etc.) and shall be required to implement reasonable measures such that the complaint is resolved. All notices that are sent to residential units within 500 feet of the construction site and all signs posted at the construction site shall list the telephone number for the disturbance coordinator.
- *Construction Traffic.* Route all construction traffic to and from the construction site via designated truck routes to the maximum extent feasible. Prohibit construction-related heavy truck traffic in residential areas where feasible.
- *Noise Disturbance Coordinator.* A "noise disturbance coordinator" shall be established. The disturbance coordinator shall 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 would be required to implement reasonable measures such that the complaint is resolved. All notices that are sent to residential units within 500 feet of the construction site and all signs posted at the construction site shall list the telephone number for the disturbance coordinator.
- *Construction Traffic.* Route all construction traffic to and from the construction site via designated truck routes to the maximum extent feasible. Prohibit construction-related heavy truck traffic in residential areas where feasible.
- *Equipment Noise Controls:* The applicant and/or its construction contractor shall implement the following equipment noise control measures during all phases of construction:
    - *Mufflers*. All construction equipment shall be equipped with muffles and other suitable noise attenuation devices (e.g., engine shields).
    - *Equipment Selection*. Grading and construction contractors shall use quieter equipment as opposed to noisier equipment (such as rubber-tired equipment rather than track equipment), to the maximum extent feasible.
    - *Provide Electric Hook-Ups*. If feasible, electric hook-ups shall be provided to avoid the use of generators. If electric service is determined to be infeasible for the site, only whisper-quiet generators shall be used (i.e., inverter generators capable of providing variable load.
- *Temporary Barriers*. During all demolition and construction activities, one or more physical barriers capable of achieving a minimum reduction in predicated noise levels by 11 dB shall be installed between future development and Magnolia Avenue and Mayflower Avenue, and between the western boundary of the Alexan Foothills Specific Plan and ZCA Area A. Potential options for achieving this level of attenuation can include, but are not limited to:
    - A concrete, wood, or other barrier installed at-grade (or mounted to structures located at-grade, such as K-Rail) along the property line. Such a wall/barrier shall consist of material

that has a minimum rated transmission loss value of 21 dB (or equivalent rating) and shall contain no gaps in the structure through which noise may pass.

- Commercially available acoustic panels or other products such as acoustic barrier blankets installed along the property line, building envelope or, if feasible and necessary, at or near sensitive residential receptor areas.
- Any combination of noise barriers and commercial products capable of achieving an 11-dB reduction in construction noise levels at sensitive receptor locations.

Requirements and Planning: This measure shall be printed on all construction drawings and included in construction contracts.

Monitoring: City Planning staff shall ensure that this measure is located on final construction drawings. City Planning staff shall conduct inspections during construction to ensure that measures are implemented.

Construction Noise Levels in ZCA Areas A and C

The type of equipment required to buildout ZCA Areas A and C would be similar to those required for the Alexan Foothills Specific Plan. Based on the smaller area of ZCA Areas A and C, it is estimated that only two large pieces of off-road equipment would be needed during the most intensive phases of construction (e.g., bulldozers, graders, excavators) of future development in ZCA Area A, and one large and small piece of equipment (e.g., bulldozer and backhoe) are assumed to be involved in any future redevelopment of ZCA Area C. Table 6-9 summarizes the hourly Leq noise levels that would be generated by construction activities at the nearest sensitive receptor locations in ZCA Areas A and C and compares these estimated noise levels against the existing ambient noise level environment.

Table 6-9: Remaining GP/ZCA Area: Estimated Construction Noise Levels

Receptor	Distance from Construction Activity	Noise Level (dBA)			
		Existing Ambient	Construction	With Barrier Attenuation(A)	Change(B)
R-1A	60 ft	66.2(C)	80.6	--	**+14.4**
R-2	70 ft	67.5(D)	82.9	72.9	+5.4
R-3	80 ft	67.5(E)	81.7	--	**+14.2**

Source: MIG 2019

(A) A permanent noise barrier is located along the southern side of the METRO Gold Line, adjacent to receptors represented by R-2. Effective noise barriers can reduce noise levels by 10 to 15 dBA. The attenuation provided by this barrier (assumed to be 10 dBA) has been factored into the estimated noise level at R-2.

(B) Per the criterion outlined in Section 6.1, a significant temporary or periodic noise impact would occur if construction activities resulted in an increase of 10 dBA Leq or more at sensitive receptor locations. **Bold** values indicate an increase of more than 10 dBA above the ambient level.

(C) The Leq value measured at ST-2 is considered representative of ambient conditions at receptor location R-1A, because the eastern portion of construction associated with the ZCA areas is closest to ST-2.

(D) The Leq value measured at ST-4 is considered representative of ambient conditions at the property boundaries of receptor location R-2, because ST-4 is the closest measurement location to R-2 in relation to where construction activities associated with the western side of theZCA areas would occur.

(E) The Leq value measured at ST-4 is considered representative of ambient conditions at receptor location R-3. Both ST-3 and ST-4 were taken along S Mayflower Ave, along which Receptor R-3 is located. Between ST-3 and ST-4, ST-4 had the lowest Leq value recorded, and therefore represents a conservative indication of ambient noise levels at receptor locations east of the Project.

As shown in Table 6-9, the estimated construction noise levels attributable to development of ZCA Areas A and C would result in potentially significant impacts at receptor locations R-1A and R-3, whether or

not construction associated with ZCA Areas A and C were to occur concurrently with implementation of the Alexan Foothills Specific Plan. Consistent with the discussion presented under the construction noise analysis for the development of the Alexan Foothills Specific Plan, these noise values represent conservative (i.e., worst-case) yet realistic estimate of potential hourly Leq noise levels. In actuality, equipment onsite would move around the work area and would generally not be situated at the same location for more than a few hours at a time. Equipment operating further away would produce lower noise levels than those presented.

Nevertheless, impacts would be potentially significant. Implementation of mitigation measure MM NOI-2 would reduce impacts to less than significant levels.

Mitigation Measures

Refer to Mitigation Measure MM NOI-2.

Combined Project Noise Levels

As described previously, the Project being analyzed is the buildout of the Alexan Foothills Specific Plan over an approximately 30-month period, with future development of ZCA Areas A and C potentially occurring during the final 12 months of the Alexan Foothills Specific Plan construction.

Development in the Specific Plan area would be well underway by the time demolition and earthmoving activities would begin in ZCA Areas A and C. The residential buildings and parking garage would likely be into vertical building construction phases by the time site preparation, grading, and/or exaction would begin in ZCA Areas A and C. The types of equipment needed for vertical structure development would generally include a crane, pneumatic tools (e.g., nail gun), and a forklift (similar in terms of horsepower as a backhoe). At a distance of 50 feet, the hourly Leq noise level associated with operation of a crane, pneumatic tool, and forklift would be approximately 84 dBA. Table 6-10 summarizes the hourly Leq noise levels that would be generated by vertical structure development within the Alexan Foothills Specific Plan area, and Table 6-11 presents the worst-case, combined noise level under full buildout of the Project area.

Table 6-10: Alexan Foothills Specific Plan: Construction Noise Levels (Structure Development)

Receptor	Distance from Construction Activity	Construction Noise Level (dBA)
R-1A / R-1B	60 ft	82.4
R-2	70 ft	81.0
R-3	260 ft	69.6
Source: MIG 2018		

Table 6-11: Combined Construction Noise Levels of the Alexan Foothills Specific Plan and ZCA Areas A and C

Receptor	Distance from Construction Activity	Noise Level (dBA)			
		Existing Ambient	Construction	With Barrier Attenuation(A)	Change(B)
R-1A / R-1B	60 ft	66.2(C)	84.6	--	**+18.4**
R-2	70 ft	67.5(D)	85.1	75.1	+7.6
R-3	80 / 260 ft	67.5(E)	82.0	--	**+14.5**

Source: MIG 2018

(A) A permanent noise barrier is located along the southern side of the METRO Gold Line, adjacent to receptors represented by R-2. Effective noise barriers can reduce noise levels by 10 to 15 dBA. The attenuation provided by this barrier (assumed to be 10 dBA) has been factored into the estimated noise level at R-2.

(B) Per the criterion outlined in Section 6.1, a significant temporary or periodic noise impact would occur if construction activities resulted in an increase of 10 dBA Leq or more at sensitive receptor locations. **Bold** values indicate an increase of more than 10 dBA above the ambient level.

(C) The Leq value measured at ST-2 is considered representative of ambient conditions at receptor location R-1A and R-1B, because the most affected receptor by construction in the eastern portion of the Project would be across, or near, ST-2.

(D) The Leq value measured at ST-4 is considered representative of ambient conditions at the property boundaries of receptor location R-2, because the most affected receptor south of the Project would have combined noise levels from construction in the Alexan Foothills Specific Plan area and the ZCA areas (on the western side).

(E) The Leq value measured at ST-4 is considered representative of ambient conditions at receptor location R-3, because of ST-3 and ST-4, ST-4 had the lowest Leq value recorded. ST-4 therefore represents a conservative indication of ambient noise levels at receptor locations east of the Project.

As shown in Table 6-11, combined unmitigated construction noise levels could be as high as 18.4 dBA above the existing ambient environment, under a worst-case scenario at sensitive receptor locations R-1A and R-1B. This change is less than the incremental increase identified for R-1A and R-1B (see Table 6-8), which would occur during earthmoving activities associated with development of the Alexan Foothills Specific Plan. As such, implementation of mitigation measure MM NOI-2, which requires a noise barrier be constructed along the eastern and western portions of active construction areas, capable of reducing noise levels by a minimum of 11 dBA, would also ensure that combined, construction noise levels associated with development of the entire Project area would not increase ambient noise levels at sensitive receptor locations by more than 10 dBA during construction activities. With implementation of mitigation measure MM NOI-2, impacts would be reduced to less than significant impacts.

Mitigation Measures

Refer to mitigation measure MM NOI-2.

6.2.4 Expose People to or Generate Excessive Groundborne Vibration or Noise

Alexan Foothills Specific Plan and ZCA Areas A and C

Buildout of the Project would require the use of heavy construction equipment that could produce groundborne vibration. The following analysis evaluates if construction of the Project would generate excessive groundborne vibration levels. Once operational, development in the Project area would not result in the use of equipment or machinery that could generate significant groundborne vibration. However, the Project is situated adjacent to the METRO Gold Line ROW, and trains travelling within the ROW would generate groundborne vibration. The analysis also evaluates if new residential receptors in the Project area would be exposed to excessive groundborne vibration from the operation of the METRO Gold Line.

Construction Vibration in the Alexan Foothills Specific Plan and ZCA Areas A and C

There is the potential that site preparation, grading, foundation construction, and other construction activities associated with the Alexan Foothills Specific Plan and other future development in ZCA Areas A and C could result in groundborne vibration that would, at worst case, occur approximately 60 feet from existing structures on South Magnolia Ave (sensitive receptor locations R-1A and R-1B, see Table 3-2). Table 6-12 lists the groundborne vibration levels associated with the potential type of construction equipment that would most likely be required while undertaking construction in the Project area.

Table 6-12: Estimated Project Construction Groundborne Vibration Levels

Equipment	Peak Particle Velocity (in/sec) (A)			Velocity Decibels (VdB) (B)		
	25 feet	60 feet	100 feet	25 feet	60 feet	100 feet
Large bulldozer	0.089	0.034	0.019	87.0	75.6	68.9
Small bulldozer	0.03	0.011	0.007	58.0	46.6	39.9
Loaded truck	0.076	0.029	0.017	86.0	74.6	67.9
Jackhammer	0.035	0.013	0.008	79.0	67.6	60.9

Sources: Caltrans 2013b and FTA 2006.

Notes:

(A) Estimated PPV calculated as: PPV(D)=PPV(ref)*(25/D)^1.1 where PPV(D)= Estimated PPV at distance; PPVref= Reference PPV at 25 ft; D= Distance from equipment to receiver; and n= ground attenuation rate (1.1 for dense compacted hard soils).

(B) Estimated Lv calculated as: Lv(D)=Lv(25 feet)-30Log(D/25) where Lv(D)= estimated velocity level in decibels at distance, Lv(25 feet)= RMS velocity amplitude at 25 f; and D= distance from equipment to receiver.

As shown in Table 6-12, , receptors 60 feet away from construction activities could be exposed to groundborne vibration levels of up to 0.034 in/sec PPV and 75.6 VdB during operation of large bulldozers. Based on Caltrans' transient criteria (see Table 4-3), these vibration levels would be "barely perceptible." Therefore, groundborne vibration levels are not predicted to exceed Caltrans' vibration damage threshold criteria for historic or older buildings (0.25 in/sec PPV), a threshold considered protective of all nearby buildings, which are presumed to be of more recent construction, and thus, not as susceptible to damage from vibration as older, unreinforced structures. Groundborne vibration from construction activities would also be infrequent and short in duration (lasting a few hours or days as equipment would not operate in the same location for a prolonged amount of time), would not damage buildings or structures, would not result in long-term incompatibility with existing land uses, and would, therefore, not be excessive. Thus, this impact would be less than significant.

Mitigation Measures

No mitigation measures are required.

Exposure to Excessive Groundborne Vibration from the METRO Gold Line in the Alexan Foothills Specific Plan and ZCA Areas A and C

The Monrovia General Plan Proposed Land Use and Circulation Elements EIR (City of Monrovia 2008) requires consideration of potential METRO Gold Line vibration impacts on residential projects located within 300 feet of the Gold Line (EIR Mitigation Measure NOI-B). Accordingly, a discussion of potential METRO Gold Line vibration impacts on development in the Project area is provided below.

The approval of the proposed Alexan Foothills Specific Plan and other future development within ZCA Areas A and C would result in the placement of new, sensitive residential land uses in close proximity to the METRO Gold Line. As explained in Section 7.1, "Existing METRO Gold Line Noise and Vibration Levels," vibration monitoring was not conducted for the Project; however, vibration monitoring was conducted in January 2018 for the Station Square South Specific Plan, an approximately 3.79-acre residential project located approximately 100 feet southwest of the Project (City of Monrovia 2018). The vibration monitoring for the South Station Square project was conducted approximately 525 feet from the Project, at a distance of 20 feet from the track centerline (Veneklassen 2018). The results of the vibration monitoring conducted for the Station Square South Specific Plan indicate groundborne vibration from passing METRO Gold Line trains was below 0.002 in/sec PPV and 65 VdB. These vibration levels are below both the Los Angeles County Vibration Limit of 0.01 in/sec PPV and the FTA's recommended vibration limit of 72 VdB for frequent events where people sleep (see Table 4-3).

The proposed Alexan Foothills Specific Plan and other future development within ZCA Areas A and C would not result in the placement of structures 20 feet or closer to the METRO Gold Line due to the width of the METRO ROW and City zoning setback requirements. Thus, the operation of the METRO Gold Line would not expose people living in the Project area to excessive groundborne vibration or groundborne noise levels. This impact would be less than significant.

Mitigation Measures

No mitigation measures are required.

6.2.5 Airport-Related Noise Levels

Alexan Foothills Specific Plan and ZCA Areas A and C

The closest airport to the Project area is San Gabriel Valley Airport, located approximately 3.7 miles southwest of the Project area. This public airport has one runway and does not generate substantial airport-related noise in the City of Monrovia. Development of the Project would not expose people living or working in the Project area to excessive airport-related noise levels. This impact would be less than significant.

Mitigation Measures

No mitigation measures are required.

6.3 IMPACT CONCLUSIONS

Buildout of the Project has the potential to place residents in areas where ambient noise levels exceed City and State standards for interior noise levels due to the proximity of the Project to I-210 and the METRO line. Impacts would be potentially significant, but they would be reduced to less than significant levels with implementation of mitigation measure MM NOI-1, which requires implementation of design features to ensure interior noise standards can be met and an acoustical analysis to confirm that standards can be met.

In addition, construction under buildout of the Alexan Foothills Specific Plan, ZCA Areas A and C, and both have the potential to result in a significant temporary increase in noise at sensitive receptor locations along Mayflower Avenue and Magnolia Avenue or between the western boundary of the Alexan Foothills Specific Plan and ZCA Areas A and C. Mitigation measure MM NOI-2 would require installation of noise barriers to reduce construction noise at sensitive receptor locations, thereby reducing impacts to less than significant levels.

Traffic noise impacts, noise impacts associated with stationary equipment, and vibration impacts would be less than significant.

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7 Report Preparers and References

This report was prepared by MIG under contract to Trammel Crow Residential. This report reflects the independent, objective, professional opinion of MIG.

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APPENDIX A: Technical Noise Data

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Alexan SP Residential Development
Magnolia Avenue, Monrovia, CA
Appendix D: Ambient Noise Monitoring Data
Prepared by MIG, June 2018

Table l1: Summary of Site LT1 Noise Monitoring Data

Site LT1 (XYZLOCATION)											
Date	Time	Duration	Leq	CNEL	Lmin	Lmax	L(5)	L(10)	L(25)	L(50)	L(90)
6/28/2018	7:00 AM	1-hour	69.6	69.6	63.6	78.9	72.9	71.8	70.2	68.9	66.8
6/28/2018	8:00 AM	1-hour	69.3	69.3	62.0	84.9	72.6	71.3	69.5	68.1	66.0
6/28/2018	9:00 AM	1-hour	68.1	68.1	60.7	86.1	71.5	70.2	68.5	67.0	64.7
6/28/2018	10:00 AM	1-hour	67.4	67.4	57.2	82.7	70.6	69.4	67.7	66.3	63.8
6/28/2018	11:00 AM	1-hour	67.6	67.6	61.3	79.3	70.9	69.9	68.2	66.6	64.5
6/27/2018	12:00 PM	1-hour	68.3	68.3	60.0	89.9	71.3	69.9	68.3	66.6	64.4
6/27/2018	1:00 PM	1-hour	67.1	67.1	57.2	80.1	71.0	69.6	67.4	65.8	63.4
6/27/2018	2:00 PM	1-hour	65.6	65.6	56.8	83.6	70.4	68.3	64.6	62.3	59.8
6/27/2018	3:00 PM	1-hour	65.0	65.0	56.8	84.0	69.7	67.9	65.0	63.1	60.3
6/27/2018	4:00 PM	1-hour	64.3	64.3	54.5	81.5	69.8	68.1	64.4	61.2	58.0
6/27/2018	5:00 PM	1-hour	66.7	66.7	56.4	81.7	72.1	70.8	67.4	63.0	59.4
6/27/2018	6:00 PM	1-hour	70.3	70.3	56.6	78.4	71.7	69.3	64.7	61.5	58.9
6/27/2018	7:00 PM	1-hour	67.2	72.2	57.1	92.3	70.9	69.0	66.4	64.9	62.7
6/27/2018	8:00 PM	1-hour	73.1	78.1	61.5	77.8	71.5	69.8	67.7	66.5	64.7
6/27/2018	9:00 PM	1-hour	67.0	72.0	60.8	80.1	70.7	69.2	67.2	65.8	63.7
6/27/2018	10:00 PM	1-hour	66.4	76.4	60.3	83.5	69.7	68.4	66.9	65.4	63.2
6/27/2018	11:00 PM	1-hour	65.5	75.5	55.6	88.5	69.1	67.7	65.9	64.1	61.6
6/28/2018	12:00 AM	1-hour	63.9	73.9	51.3	77.9	68.0	66.7	64.6	62.5	59.4
6/28/2018	1:00 AM	1-hour	62.1	72.1	50.2	75.7	66.7	65.4	63.0	60.4	56.3
6/28/2018	2:00 AM	1-hour	63.6	73.6	47.8	85.1	67.2	65.9	63.6	60.7	56.8
6/28/2018	3:00 AM	1-hour	63.0	73.0	52.3	79.0	67.3	66.1	63.6	61.5	57.7
6/28/2018	4:00 AM	1-hour	65.3	75.3	56.4	77.0	68.9	67.8	66.2	64.3	61.5
6/28/2018	5:00 AM	1-hour	68.3	78.3	61.1	89.9	71.0	69.9	68.2	66.9	64.7
6/28/2018	6:00 AM	1-hour	70.0	80.0	62.5	87.1	73.2	72.0	70.4	69.0	66.5
		Daytime (7 AM to 7 PM)	*67.8*	*--*	*54.5*	*89.9*	*71.3*	*69.9*	*67.6*	*65.7*	*63.4*
		Evening (7 PM to 10 PM)	*70.1*	*--*	*57.1*	*92.3*	*71.0*	*69.4*	*67.1*	*65.8*	*63.8*
		Nighttime (10 PM to 7 AM)	*66.1*	*--*	*47.8*	*89.9*	*69.5*	*68.3*	*66.5*	*64.8*	*62.1*
		24-Hour	*--*	*73.5*	*47.8*	*92.3*	*70.7*	*69.3*	*67.1*	*65.4*	*63.0*

Alexan SP Residential Development
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Table l2: Summary of Site LT2 Noise Monitoring Data

Site LT2											
Date	Time	Duration	Leq	CNEL	Lmin	Lmax	L(5)	L(10)	L(25)	L(50)	L(90)
6/28/2018	7:00 AM	1-hour	71.0	71.0	47.8	90.6	71.5	61.6	58.2	52.9	50.5
6/28/2018	8:00 AM	1-hour	70.7	70.7	46.3	91.2	70.3	61.0	57.5	51.8	49.3
6/28/2018	9:00 AM	1-hour	68.9	68.9	44.6	90.8	67.9	61.6	59.5	53.2	49.0
6/28/2018	10:00 AM	1-hour	68.9	68.9	45.3	91.3	67.0	61.4	58.6	52.2	48.2
6/28/2018	11:00 AM	1-hour	69.0	69.0	45.4	91.9	69.4	63.4	58.6	52.3	48.8
6/27/2018	12:00 PM	1-hour	70.2	70.2	45.4	92.4	67.0	61.1	58.2	51.5	48.6
6/27/2018	1:00 PM	1-hour	69.5	69.5	45.7	92.2	66.9	60.9	58.2	51.2	48.5
6/27/2018	2:00 PM	1-hour	72.0	72.0	45.8	92.9	70.3	62.1	57.2	50.9	48.3
6/27/2018	3:00 PM	1-hour	71.2	71.2	46.5	92.5	72.2	61.4	53.0	51.2	48.8
6/27/2018	4:00 PM	1-hour	73.5	73.5	43.9	92.3	76.7	65.1	53.9	50.3	47.5
6/27/2018	5:00 PM	1-hour	73.0	73.0	45.8	93.5	74.5	62.8	54.8	51.6	48.7
6/27/2018	6:00 PM	1-hour	72.3	72.3	46.1	91.9	73.8	63.7	55.2	51.6	48.6
6/27/2018	7:00 PM	1-hour	71.8	76.8	47.0	92.1	70.6	60.9	54.5	52.0	49.6
6/27/2018	8:00 PM	1-hour	69.6	74.6	47.6	91.6	67.7	58.9	53.4	51.2	49.2
6/27/2018	9:00 PM	1-hour	68.2	73.2	45.3	91.6	65.3	56.5	52.4	50.0	47.9
6/27/2018	10:00 PM	1-hour	67.4	77.4	45.4	91.0	57.6	53.4	50.4	48.8	47.2
6/27/2018	11:00 PM	1-hour	66.7	76.7	40.6	91.3	60.8	52.9	49.2	47.4	45.4
6/28/2018	12:00 AM	1-hour	66.7	76.7	40.2	90.5	59.7	52.5	48.4	46.3	44.1
6/28/2018	1:00 AM	1-hour	63.3	73.3	39.2	90.6	53.5	49.7	47.0	45.3	43.0
6/28/2018	2:00 AM	1-hour	63.7	73.7	40.5	90.6	56.5	50.5	47.7	46.3	43.8
6/28/2018	3:00 AM	1-hour	61.6	71.6	40.7	90.7	51.2	49.7	48.5	47.3	45.1
6/28/2018	4:00 AM	1-hour	67.7	77.7	44.0	90.8	62.1	59.9	57.9	53.3	48.7
6/28/2018	5:00 AM	1-hour	70.3	80.3	48.8	90.8	67.4	61.1	58.7	53.2	51.0
6/28/2018	6:00 AM	1-hour	71.5	81.5	47.9	90.8	71.6	61.7	59.2	54.2	51.5
		Daytime (7 AM to 7 PM)	*71.1*	--	*43.9*	*93.5*	*71.8*	*62.4*	*57.3*	*51.8*	*48.8*
		Evening (7 PM to 10 PM)	*70.1*	--	*45.3*	*92.1*	*68.4*	*59.1*	*53.5*	*51.2*	*49.0*
		Nighttime (10 PM to 7 AM)	*67.6*	--	*39.2*	*91.3*	*64.4*	*57.1*	*54.7*	*50.4*	*47.7*
		24-Hour	--	*75.1*	*39.2*	*93.5*	*69.7*	*60.6*	*56.1*	*51.2*	*48.4*

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Table l3: Summary of Site ST-1 Noise Monitoring Data

Site ST-1 (Southeast corner of project area, S. Magnolia and Metro Gold Line)										
Date	Time Start	Duration	Leq	Lmin	Lmax	L(5)	L(10)	L(25)	L(50)	L(90)
6/27/2018	12:00 PM	10 mins	69.3	50.5	87.9	73.1	68.5	66.3	63.0	55.2
6/27/2018	12:10 PM	10 mins	70.3	49.7	86.9	75.7	71.0	67.3	64.8	56.5
6/27/2018	12:20 PM	10 mins	63.7	50.7	74.1	68.4	67.2	65.3	62.2	54.2
		Average:	*68.6*	*49.7*	*87.9*	*73.3*	*69.2*	*66.4*	*63.5*	*55.4*

Table l4: Summary of Site ST-2 Noise Monitoring Data

Site ST-2 (Northeast corner of project area, S. Magnolia and W. Evergreen)										
Date	Time Start	Duration	Leq	Lmin	Lmax	L(5)	L(10)	L(25)	L(50)	L(90)
6/27/2018	12:40 PM	10 mins	66.2	58.6	82.9	70.4	68.3	65.9	63.9	61.8
6/27/2018	12:50 PM	10 mins	66.9	57.0	81.0	72.3	69.2	66.6	64.3	61.2
6/27/2018	1:00 PM	10 mins	67.4	60.3	79.4	73.2	70.2	67.2	64.6	62.0
		Average:	*66.9*	*57.0*	*82.9*	*72.1*	*69.3*	*66.6*	*64.3*	*61.7*

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Table I5: Summary of Site ST-3 Noise Monitoring Data

Site ST-3 (Northwest Corner of Project Area - Mayflower Ave. and W. Evergreen)										
Date	Time	Duration	Leq	Lmin	Lmax	L(5)	L(10)	L(25)	L(50)	L(90)
6/28/2018	9:55 AM	10 mins	67.8	57.9	83.7	71.1	68.9	66.7	65.2	62.0
6/28/2018	10:05 AM	10 mins	68.6	59.8	86.7	72.4	70.0	67.5	66.1	63.0
6/28/2018	10:15 AM	10 mins	68.7	61.0	84.1	72.2	69.8	67.7	66.3	63.9
		Average:	*68.4*	*57.9*	*86.7*	*71.9*	*69.6*	*67.3*	*65.9*	*63.0*

Table I6: Summary of Site ST-4 Noise Monitoring Data

Site ST-4 (Southwest Corner of Project Area - Mayflower Ave and Metro Gold Line)										
Date	Time	Duration	Leq	Lmin	Lmax	L(5)	L(10)	L(25)	L(50)	L(90)
6/28/2018	10:35 AM	10 mins	67.5	55.0	77.6	72.8	71.2	68.7	65.1	58.7
6/28/2018	10:45 AM	10 mins	73.9	54.8	94.4	74.0	71.7	68.7	65.6	58.7
6/28/2018	10:55 AM	10 mins	70.2	53.5	89.0	73.3	71.6	68.4	64.6	57.0
6/28/2018	11:05 AM	10 mins	67.6	57.9	81.6	71.8	69.9	67.9	66.0	61.4
		Average:	*70.7*	*53.5*	*94.4*	*73.0*	*71.2*	*68.4*	*65.4*	*59.2*

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Table l7: Summary of Site ST-5 Noise Monitoring Data

Site ST-5 (On West Evergreen Ave., approximatley 210 feet west S. Magnolia Ave)										
Date	Time	Duration	Leq	Lmin	Lmax	L(5)	L(10)	L(25)	L(50)	L(90)
6/28/2018	11:10 AM	10 mins	66.5	59.4	77.8	70.7	69.0	66.7	65.0	62.3
6/28/2018	11:20 AM	10 mins	66.9	61.1	78.2	71.2	68.9	66.9	65.3	63.5