

Final Supplemental Environmental Impact Report 3 for

METRO GOLD LINE

Evaluating Relocation of the
San Dimas Station
Parking Facility

FOOTHILL EXTENSION

Azusa to Montclair (SCH No. 2010121069)

July 2022

APPENDIX C:

NOISE AND VIBRATION TECHNICAL MEMORANDUM



Foothill Gold Line

Metro Gold Line Foothill Extension Construction Authority



Cross-Spectrum Acoustics Inc.

Massachusetts

Utah

California

TECHNICAL MEMORANDUM

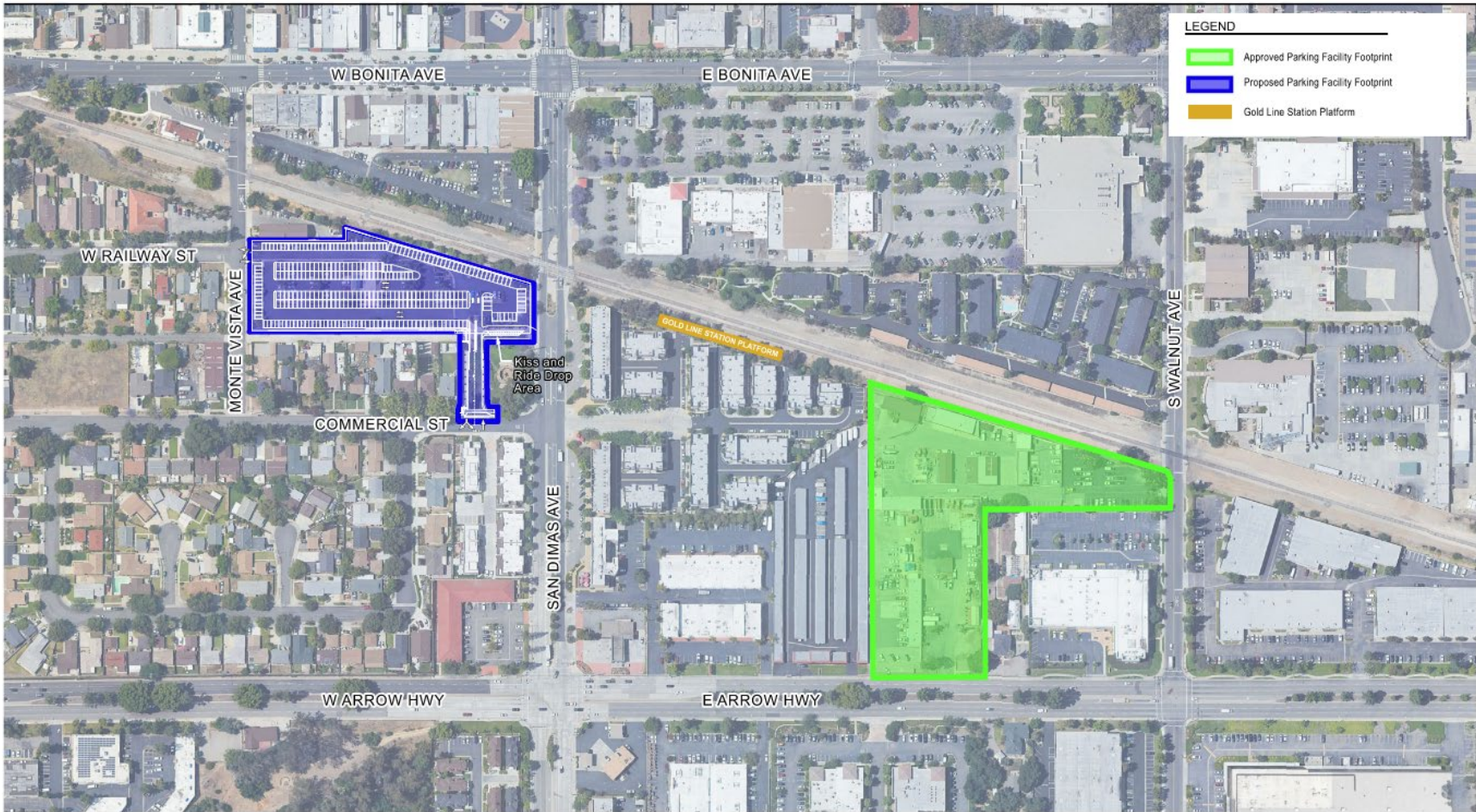
To: Natasha Peterson, Foothill Gold Line Construction Authority
From: Shannon McKenna, Cross-Spectrum Acoustics Inc.
Date: ~~August 23, 2021~~ May 24, 2022
Subject: Noise Assessment of San Dimas Modified Parking Facility
Foothill Gold Line Construction Authority

This technical memorandum presents the evaluation of noise levels for a change in the site of the parking facility in San Dimas for the Foothill Gold Line Azusa to Montclair project. The Foothill Gold Line Construction Authority originally approved parking structures as part of the Final Environmental Impact Report (EIR). Modified parking lots were subsequently approved for Glendora, San Dimas, La Verne, Pomona, and Claremont stations as part of Supplemental EIR #2. The noise levels for the originally approved San Dimas parking structure from the Final EIR, the modified lot option from the Supplemental EIR #2, and the currently proposed modified parking option are assessed using the methodology in the Federal Transit Administration's Noise and Vibration Impact Assessment guidance manual (the FTA guidance manual)¹.

The proposed modified parking facility location for San Dimas is located south of the project right-of-way between Monte Vista Avenue and San Dimas Avenue, in the location of an existing parking lot. The location of the proposed modified parking facility and the parking lot assessed for the Supplemental EIR #2 (approved parking facility) are is shown in Figure 1 ~~with the nearest noise sensitive receivers. The nearest noise sensitive receivers to the modified parking lot are the residences on Commercial Street. The nearest noise sensitive receivers to the Supplement EIR #2 lot are the multi-family development just south of the proposed Gold Line Station platform. The Final EIR parking location overlapped with the northern portion of the Supplement EIR #2 lot. The parking structure assessed in the Final EIR, shown in Figure 2, is located two blocks to the east, south of the project right of way and west of Walnut Avenue. The parking lot assessed for the Supplemental EIR #2 overlaps the Final EIR location and is also shown in in Figure 2.~~

The change in noise level resulting from the parking lot modifications depend on the change in number of parking spaces and the change in distance to the noise-sensitive receivers. The predicted noise levels for the proposed modified San Dimas parking facility, including noise generated as a result of proposed access points, are lower than the predicted noise levels for the Final EIR parking facility due to a reduced number of spaces proposed resulting from changing the parking structure to a surface lot. The predicted noise levels for the proposed modified San Dimas parking facility, including access points, are lower than the predicted noise levels for the Supplemental EIR #2 facility because the nearest sensitive receivers are farther from the proposed modified lot location.

¹ *Transit Noise and Vibration Impact Assessment* Document FTA Report No. 0123. Office of Planning and Environment Federal Transit Administration. September 2018.



Source: Hill International 2021



Figure 1-3
San Dimas Alternative Parking Lot Site Plan

Figure 1: San Dimas Modified Parking Lot Site Plan

METHODOLOGY

The FTA guidance manual provides screening distances for different noise sources. The screening distances recommended for parking facilities is 125 feet for unobstructed sensitive receivers and 75 feet for sensitive receivers with intervening buildings between the parking area and the receiver. The nearest noise sensitive receivers to the modified parking facility in San Dimas are within the FTA’s recommended screening distance of 125 feet, indicating a noise impact assessment is needed.

The noise levels from the parking facility are predicted using the reference noise levels and formulas provided in the FTA guidance manual. The reference Sound Exposure Level (SEL)² for parking garages is 92 dBA at 50 feet for a garage with 1000-car capacity in peak activity hour. The reference level is adjusted for distance to the sensitive receiver and the car capacity of the garage using the following formula:

$$Leq(1hr) = SEL_{ref} + 10 \log \left(\frac{N_{autos}}{1000} \right) - 25 \log \left(\frac{D}{50} \right) - 35.6$$

where:

<i>Leq(1hr)</i>	=	1-hour equivalent noise level at the sensitive receiver
<i>SEL_{ref}</i>	=	Reference Sound Exposure Level
<i>N_{autos}</i>	=	Number of automobiles per hour
<i>D</i>	=	Distance from the parking garage to the sensitive receiver

The noise levels from the driveway access point on Commercial Street are predicted separately from the noise from the parking lot. The reference SEL for automobiles and vans is 74 dBA at 50 feet and 50 mph. The reference level is adjusted for distance to the sensitive receiver, number of vehicles using the driveway, and speed of the vehicles using the following formula:

$$Leq(1hr) = SEL_{ref} + 10 \log(N_{autos}) + 30 \log \left(\frac{S}{50} \right) - 15 \log \left(\frac{D}{50} \right) - 35.6$$

where *S* is the speed of the vehicles.

OPERATIONAL NOISE ASSESSMENT

Figure 1 shows an aerial map of the proposed modified parking lot in San Dimas. The nearest noise sensitive receiver to the parking lot is located 60 feet to the south of the lot and the nearest noise sensitive receiver to the middle of the access drive on Commercial Street is 43 feet. Table 1 presents the parking volumes for the previously approved structure and the modified lot, the distance to the nearest noise-sensitive receiver, and the predicted ~~change in~~ 1-hour Leq noise levels. The modified lot has fewer spaces compared to the Final EIR structure and is farther from the sensitive receivers ~~the proposed modified lot are a similar distance to the nearest noise sensitive receiver, but the modified lot has fewer spaces~~ resulting in a lower predicted noise level compared to the Final EIR structure. The Supplemental EIR #2 modified lot has an equal number of spaces to the proposed modified lot, but the proposed modified lot is farther from the nearest noise sensitive receivers, resulting in a lower predicted noise level.

Noise levels for the access drive are only presented for the Commercial Street access drive for the proposed modified lot. The predicted noise level from the access drive at the closest sensitive receiver is 4 decibels less than the noise level at the closest sensitive receiver to the proposed modified parking lot. The predicted noise from the access drive does not include any reduction from a concrete property wall

² Sound Exposure Level is the level of sound accumulated over a given time interval or event.

between the drive and the nearest sensitive receiver, so the noise levels experienced at the nearest noise sensitive receiver would likely be lower than the predicted level.

Table 1. Changes in Parking Volumes and Predicted 1-hr Leq Noise Levels

	2013 Final EIR Structure	2020 Supplemental EIR #2 Modified Lot	Proposed Modified Lot, parking area	Proposed Modified Lot, access drive
Number of Parking Spaces Proposed	450	289	289	NA
Minimum Distance to Sensitive Receivers	55 feet	55 45 feet	60 feet	<u>43 feet</u>
Predicted Noise Level, 1-hr Leq	52 dBA	50 2 dBA	49 dBA	<u>45 dBA</u>

The FTA noise impact criteria for residential land use utilizes the 24-hour day-night noise level metric, or Ldn. The Ldn is the sound exposure level over 24-hours with a 10 dB penalty for noise during nighttime hours to account for the greater sensitivity of people to nighttime noise. The impact threshold is based on the existing noise level. The existing noise levels for the noise sensitive receivers shown in Figure 1 are based on the noise measurement data presented in the Final EIR³.

Table 2 presents the predicted Ldn compared to the FTA impact threshold for the noise sensitive receivers closest to the proposed modified parking lot in San Dimas. The Ldn for the parking lot is predicted assuming that the number of automobiles per hour using the lot is the full capacity of the lot (289 vehicles) between 4 a.m. to 10 p.m. Predictions assume the number of automobiles per hour is half the capacity of the lot from 10 p.m. to 2 a.m. and that no cars enter or exit the lot from 2 a.m. to 4 a.m. The assumptions for number of automobiles per hour are meant to be conservative to avoid underpredicting noise levels from the parking lots, and is consistent with the assumptions in Supplemental EIR #2. Table 2 shows the predicted noise level at the San Dimas modified parking lot is below the FTA impact threshold.

The predicted Ldn for the access drive assumes that vehicles will be traveling 15 mph and the number of automobiles per hour using this access point is one half the number of spaces between 4am and 10pm and one quarter the number of spaces between 10pm and 2am. As shown in Table 2, the predicted Ldn from the access drive is also below the FTA moderate noise impact threshold.

Because the predicted noise levels are ~~is~~ below the FTA impact threshold for moderate or severe noise, no noise mitigation measures are recommended for the San Dimas modified parking lot.

Table 2. Noise Impact Assessment for San Dimas Modified Parking Lot

	San Dimas
Existing Noise Level, Ldn	65 dBA
Moderate Noise Impact Threshold, Ldn	61 dBA
Severe Noise Impact Threshold, Ldn	66 dBA
Predicted Ldn	53 dBA
<u>Predicted Ldn, access driveway</u>	<u>50 dBA</u>
Impact Assessment	No Impact

³ 2013 Final Environmental Impact Report (Final EIR) for the Metro Gold Line Foothill Extension from Azusa to Montclair Project



Figure 21: Aerial Map of Proposed Modified Parking Lot and the Nearest Noise-Sensitive Receiver for San Dimas Station

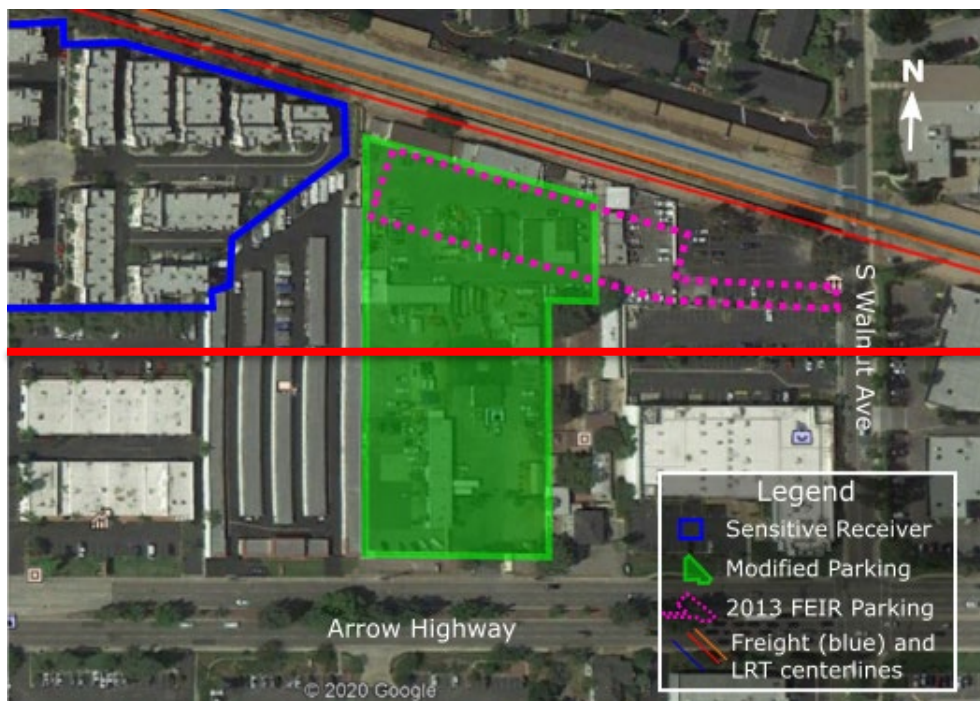


Figure 2: Aerial Map of 2013 FEIR Parking Structure, Modified SEIR #2 Parking Structure, and the Nearest Noise-Sensitive Receiver for San Dimas Station

CONSTRUCTION NOISE ASSESSMENT

CONSTRUCTION NOISE ASSESSMENT METHODOLOGY

Construction noise levels depend on the number of pieces and type of equipment, their general condition, the amount of time each piece operates per day, the presence of any noise attenuating features such as walls, and the location of construction activities relative to the sensitive receivers. The majority of these variables are left to the discretion of the contractor, so the assessment of the construction noise is an estimate based on likely means and methods and source reference noise levels from the FTA guidance manual.

The potential noise impact from the construction of the proposed modified lot shown is assessed using the FTA guidance manual’s methodology for a detailed construction noise assessment, consistent with the construction noise methodology approach used in the Final EIR. The noise level over an 8-hour workshift is predicted for each piece of equipment using the formula:

$$Leq_{equip} = L_{emission} + 10 \log(Adj_{usage}) - 20 \log(D/50)$$

where:

- Leq_{equip} = Leq at a receiver from the operation of a single piece of equipment
- $L_{emission}$ = Source reference noise emission level in dBA at 50 feet
- Adj_{usage} = The usage factor to account for the fraction of time that the equipment is in use over the work shift
- D = Distance from the sensitive receiver to the piece of equipment in feet

The predicted noise level for an 8-hour work shift is the sum of the levels for each phase using decibel addition. The equipment and usage factor assumed for grading and paving activities are shown in Table 3 and Table 4, respectively.

Table 3. Construction Equipment for Grading

<u>Equipment</u>	<u>Usage Factor, Parking Lot</u>	<u>Usage Factor, Access Drive</u>	<u>Source Reference Level, dBA at 50 ft</u>
Air compressor	0.25	0	80
Backhoe	0.75	0.125	80
Grader	0.75	0.125	85
Loader	0.5	0.25	80
Roller	0.25	0.20	85
Truck	0.25	0.25	84

Table 4. Construction Equipment for Paving

<u>Equipment</u>	<u>Usage Factor, Parking Lot</u>	<u>Usage Factor, Access Drive</u>	<u>Source Reference Level, dBA at 50 ft</u>
Backhoe	0.75	0	80
Concrete Mixer	0.125	0.125	85
Paver	0.5	0.125	85
Roller	0.25	0.20	85
Truck	0.25	0.25	84

CONSTRUCTION NOISE CRITERIA

The city of San Dimas does not specify a noise limit for construction noise but does prohibit construction “between eight p.m. of one day and seven a.m. of the next day, at any time on Sunday, or at any time on a public holiday in such a manner that a reasonable person of normal sensitivity residing in the area is caused discomfort or annoyance unless beforehand a permit is obtained.”

The FTA Guidance Manual provides guidance on appropriate thresholds for construction noise assessment during the environmental phase, but it states that the limits should not be considered “standardized criteria.” The FTA Guidance Manual recommends a reasonable threshold for construction noise is an 8-hour Leq of 80 dBA at residential uses. This is the same impact threshold that was applied in the Final EIR.

CONSTRUCTION NOISE ASSESSMENT RESULTS

The predicted 8-hour work shift Leqs for grading and paving activities are shown in Table 5 for the access drive and the parking lot. During the construction of the access drive on Commercial Street, the activities on average will take place at the center of the drive which is 43 feet from the sensitive receiver. The predicted construction noise levels for the access drive also include a -5 dB adjustment to account for the concrete wall at the property line. During the construction of the parking lot, activities on average will take place in the center of the lot which is about 130 feet to the nearest sensitive receiver. The predicted noise levels for paving and grading of the access drive and main parking lot are below the noise impact threshold.

Table 5. Predicted Construction Noise Levels

<u>Activity</u>	<u>Distance</u>	<u>Predicted Noise Level, Leq(8hr), dBA</u>	<u>Impact Threshold, Leq(8hr), dBA</u>
<u>Grading, access drive</u>	<u>43 ft</u>	<u>79^a</u>	<u>80</u>
<u>Grading, parking lot</u>	<u>130 ft</u>	<u>79</u>	<u>80</u>
<u>Paving, access drive</u>	<u>43 ft</u>	<u>79^a</u>	<u>80</u>
<u>Paving, parking lot</u>	<u>130 ft</u>	<u>78</u>	<u>80</u>

^a Predicted noise level for access drive includes a -5 dB adjustment for the concrete wall at the property line.



Foothill Gold Line

Metro Gold Line Foothill Extension Construction Authority