

Chapter 3. Environmental Evaluation

The Project and its Project Refinements are subject to state environmental review requirements. Therefore, Project documentation has been prepared in compliance with CEQA. The Authority is the Project proponent and the lead agency under CEQA. As defined throughout this Supplemental EIR No. 2, CEQA requires the Authority to identify each “significant impact on the environment” resulting from the Project Refinements listed in Chapter 2, Project Description, as well as document measures to mitigate each significant impact. Each significant impact on the environment must be disclosed in the EIR process and mitigated, if feasible. In addition, CEQA Guidelines list a number of mandatory findings of significance, which also require the preparation of an EIR. In all, this Chapter discusses the impacts of the Project Refinements and CEQA significance.

Chapter 3 describes any environmental impacts identified that would be considered significant under CEQA. Each section of Chapter 3 is structured similarly, focusing discussion on existing conditions, environmental impacts, mitigation measures, and impact result with mitigation for each Project Refinement. However, some sections demand a more in-depth and/or supplemental analysis, leading to expanded sections or a varied approach. Additionally, only applicable resources are discussed herein for each of the Project Refinements, which include noise, cultural resources, geological and hazardous materials, as well as traffic and transportation.

3.1 Noise and Vibration

This section discusses the existing noise environment and analyzes potential noise and vibration impacts from implementation of the Project Refinements.

3.1.1 Methodology and Definitions

Noise is typically defined as unwanted or undesirable sound, where sound is characterized by small air pressure fluctuations above and below the atmospheric pressure. The basic parameters of environmental noise that affect human response to sound are the following:

- Intensity or level,
- Frequency content, and
- Variation with time.

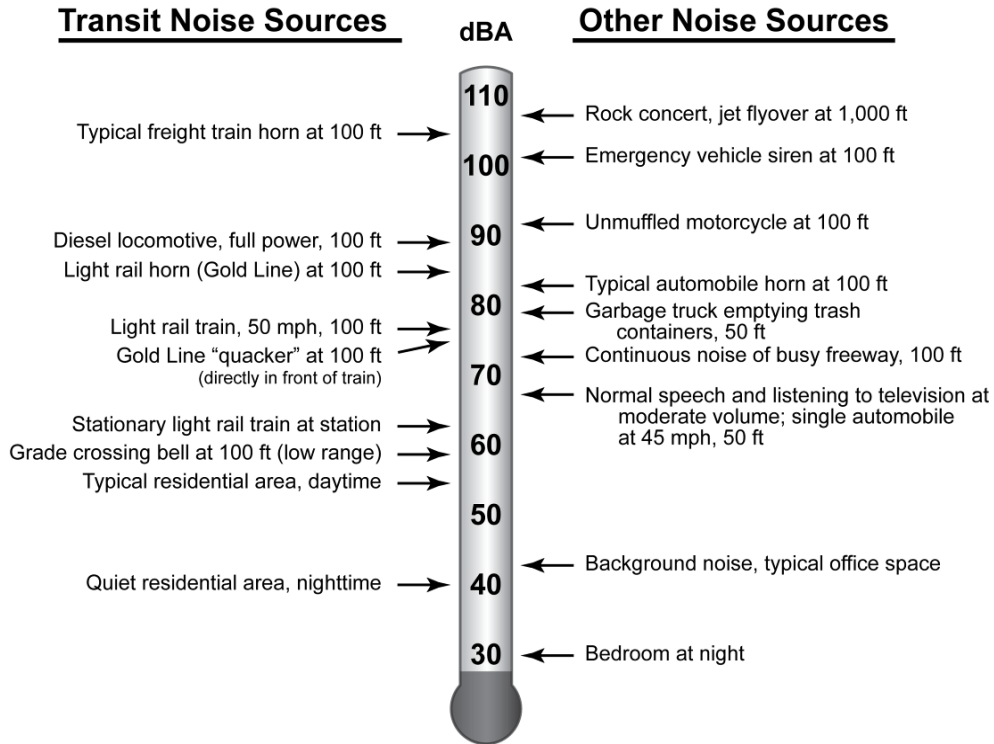
Intensity is determined by how greatly the sound pressure fluctuates above and below the atmospheric pressure, and is expressed on a logarithmic scale in units of decibels (dB). By using this scale, the range of normally encountered sound can be expressed by values between 0 and 120 dB. On a relative basis, a 3-dB change in sound level generally represents a noticeable change in loudness, whereas a 10-dB change is typically perceived as a doubling (or halving) in the loudness of a sound.

The frequency content of noise is related to the tone or pitch of the sound, and is expressed based on the rate of the air pressure fluctuations in cycles per second called hertz (Hz). The human ear can detect frequencies from about 20 Hz to 17,000 Hz; however, the sensitivity of human hearing varies

with frequency. The A-weighting system is commonly used when measuring environmental noise to which humans are most sensitive. Sound levels measured using this weighting system are called “A-weighted” sound levels and are expressed as “dBA.”

Figure 3.1-1 includes examples of A-weighted sound levels from common indoor and outdoor sounds.

Figure 3.1-1: Typical Indoor and Outdoor Noise Levels



Environmental sound constantly fluctuates and can be expressed using many different metrics. The metrics used in this report to characterize varying sound environments are:

- **Maximum Sound Level (L_{max})** is the maximum sound level that occurs during an event, such as a train passing.
- **Equivalent Sound Level (L_{eq})** is the most common means of characterizing fluctuating community noise. L_{eq} represents a constant sound that, over a specified period of time, has the same sound energy as the time-varying sound. L_{eq} is used by the Federal Transit Administration (FTA) to evaluate noise impacts from proposed transit project at institutional land uses, such as schools, churches, and libraries.
- **Day-Night Sound Level (L_{dn})** is a 24-hour L_{eq} with an adjustment to reflect the greater sensitivity of most people to nighttime noise. The adjustment is a 10 dB penalty for all sound that occurs from the hours of 10:00 p.m. to 7:00 a.m., which means that any event occurring during the nighttime is equivalent to 10 occurrences of the same event during the daytime. L_{dn} is the most common measure of total

community noise over a 24-hour period and is used by the FTA to evaluate residential noise impacts from proposed transit projects.

- **Percent Exceedance Level (L_{xx})** is the sound level that is exceeded for a certain percentage of the measurement period (e.g., L_{99} is the sound level exceeded during 99 percent of the measurement period). For a 1-hour period, L_{99} is the sound level exceeded for all except 36 seconds of the hour. L_1 represents typical maximum sound levels; L_{33} is approximately equal to L_{eq} when free-flowing traffic is the dominant noise source; L_{50} is the median sound level; and L_{99} is close to the minimum sound level.
- **Sound Exposure Level (SEL)** is a measure of the acoustic energy of an event, such as a train passing. In essence, the acoustic energy of the event is compressed into a 1-second period. SEL increases as the sound level of the event increases and as the duration of the event increases. It is often used as an intermediate value in calculating overall metrics such as L_{eq} and L_{dn} .

Analysis for vibration and its methodology is as follows. Vibration associated with operation of the Phase 2A was previously analyzed in the 2007 Final EIR. As part of ongoing design adjustments during the Advanced Conceptual Engineering phase, the preliminary vibration analysis was expanded to better define the limits of vibration mitigation required along the entire alignment. As such, a discussion of vibration and its methodology herein is limited to mitigation proposed for the vibration impact identified at a single-family residence in the City of Azusa. The Authority is investigating the preferred option to mitigate the impact and has identified performance standards that will be met by all feasible mitigation measures. Refer to Section 4.12 of the 2011 Supplemental EIR No. 1 for an in-depth discussion of vibration methodology and definitions.

3.1.2 Existing Conditions

Adding TPSS in Various Cities within Phase 2A: Michillinda TPSS (TPSS No. 0)

This section describes the existing conditions for all three alternative site locations for the Michillinda TPSS (TPSS No. 0) unit. Alternatives for the Soldano TPSS (TPSS No. 8A) unit are not evaluated since this unit was previously approved and would be required in addition to the Citrus TPSS (TPSS No. 8B) unit, as described in the 2007 Final EIR Addendum No. 2.

The Michillinda TPSS Alternative A site is currently occupied by a single-family residence adjacent to residential properties on Arboleda Street, just north of Interstate 210 Rosemead Boulevard westbound on- and off-ramps. The nearest noise-sensitive receivers to the Alternative A site are a number of single-family residences on Arboleda Avenue, with the closest receiver being a single-family residence located adjacent to the proposed parcel (approximately 10 feet from the property line).

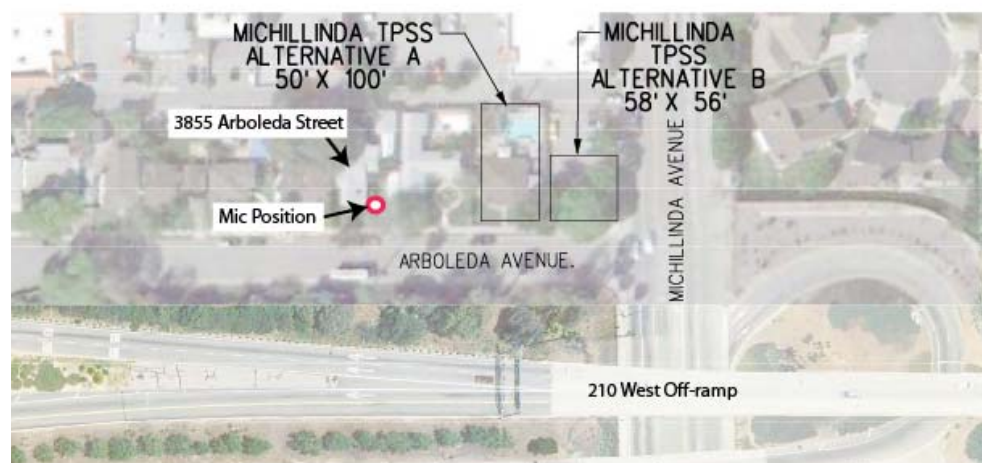
A 24-hour noise measurement was performed in the front yard of this single-family residence at 3855 Arboleda Avenue. Figure 3.1-2 shows the location of the measurement with respect to Alternative A. The measured L_{dn} was 66 dBA, with the dominating noise source in the area being traffic from Interstate 210. Refer to Appendix A for the measured 1-second L_{eq} and 1-hour L_{eq} for

the noise measurement period as well as for the noise metrics for each hour of the noise measurement.

Alternative B site is a paved parking lot located on the northwest corner of the Michillinda Avenue and Arboleda Avenue intersection and just north of Interstate 210. The nearest noise-sensitive receiver to the Alternative B site is the single-family residence currently located at the Alternative A site.

A 24-hour noise measurement was performed in the front yard of the single-family residence at 3855 Arboleda Street. Figure 3.1-2 shows the location of the measurement with respect to Alternative B. The measured L_{dn} was 66 dBA, with the dominant noise source in the area being traffic from Interstate 210. Refer to Appendix A for the measured 1-second L_{eq} and 1-hour L_{eq} for the noise measurement period as well as for the noise metrics for each hour of the noise measurement.

Figure 3.1-2: Measurement Location at 3855 Arboleda Avenue



Alternative C site is one of three sites that were considered within Caltrans right-of-way. Due to design and location demands, Alternative C was chosen for analysis. The site is located south of Interstate 210 at the intersection of three freeway ramps, the North Colorado Boulevard eastbound on-ramp to the east, the North Colorado Boulevard eastbound off-ramp to the west, and the Rosemead Boulevard eastbound on-ramp to the north. The nearest noise-sensitive receiver to the Alternative C site is a single-family residence on Quigley Street, approximately 60 feet from the site.

A 24-hour noise measurement was performed in the back yard of the single-family residence at 34 North Quigley Avenue. Figure 3.1-3 shows the location of the measurement with respect to Alternative C. The measured L_{dn} was 57 dBA, which was significantly lower than noise measurements north of Interstate 210. The lower sound levels are most likely due to a sound barrier running along the south side of Interstate 210. Refer to Appendix A for related L_{eq} noise measurements as well as noise metrics for each hour of the noise measurements.

Figure 3.1-3: Measurement Location at 34 Quigley Avenue

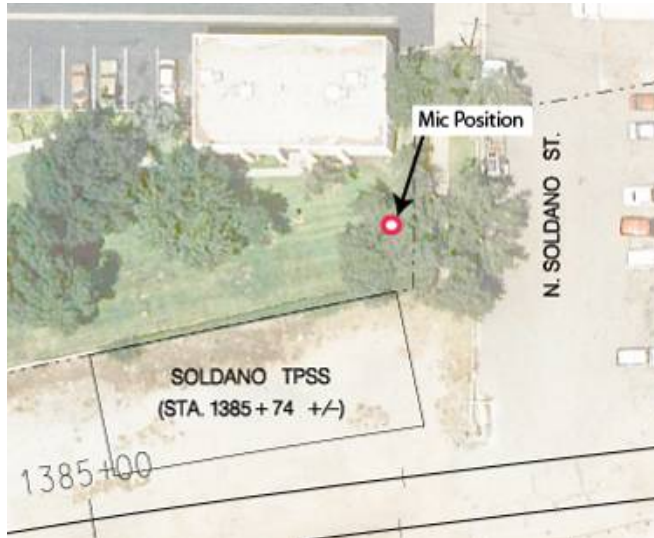


Adding TPSS in Various Cities within Phase 2A: Soldano TPSS (TPSS No. 8A)

The Soldano TPSS would be in the City of Azusa and located north of the Project alignment within Authority right-of-way, west of North Soldano Street. The nearest noise-sensitive receiver is a multi-family residential building approximately 42 feet north of this proposed TPSS site, with the closest receiver being the residents living on the south side of the complex.

A 24-hour measurement was conducted at the back of the residential complex, facing the rail right-of-way. Figure 3.1-4 shows the location of the measurement with respect to the proposed Soldano TPSS site. The measured L_{dn} was 57 dBA, with the dominant noise source in the area being traffic on 9th Street and activity at Azusa Heating and Plumbing Supply (located across the street from the multi-family residential complex). In addition, two freight trains pass daily on the existing track. Refer to Appendix A for the 1-second L_{eq} and 1-hour L_{eq} measurements for the noise measurement period as well as for the noise metrics for each hour of the noise measurement.

Figure 3.1-4: Measurement Location at Soldano Avenue and 9th Street



Relocating the Duarte Station Parking Facility in the City of Duarte

As defined in Chapter 2, relocating the parking facility for the Duarte Station from its proposed location in the 2007 Final EIR is needed to support pedestrian accessibility and safety, to lessen circulation impacts on surrounding businesses, and to reduce impacts to residential uses. This section describes the existing conditions for both alternative site locations for the Duarte Station parking facility.

Alternative A would be located at the corner of Business Center Drive and Highland Avenue in an east-west orientation, approximately 1000 feet east of the location proposed in the 2007 Final EIR. Compared to the location proposed in the 2007 Final EIR, Alternative A is located east of the GE Aviation building and farther from the noise-sensitive receivers analyzed in the 2007 Final EIR. Though Alternative A is surrounded by commercial land uses, a noise measurement was still conducted to determine the existing noise conditions.

Similar to Alternative A, Alternative B would be located at the corner of Business Center Drive and Highland Avenue, approximately 1000 feet east of the location proposed in the 2007 Final EIR. The differences between the two alternatives are the orientations of the parking facilities; Alternative B is oriented in a north-south direction compared to Alternative A's east-west orientation. Compared to the location proposed in the 2007 Final EIR, Alternative B is also located east of the GE Aviation building and farther from the noise-sensitive receivers analyzed in the 2007 Final EIR. Though surrounded by the same commercial land uses described under Alternative A, a noise measurement was still conducted to determine the existing noise conditions.

For both alternatives, a 24-hour noise measurement was conducted at 1609 Denning Avenue, the closest residence near both alternatives. Figure 3.1-5 shows the location of the measurement with respect to the GE Aviation building, directly west of both alternatives. The measured L_{dn} was 66 dBA, with the dominant noise source in the area being traffic noise from Interstate 210 (approximately 300 feet north of the residence) and traffic on Denning Avenue and Business Center

Drive. Refer to Appendix A for the measured 1-second L_{eq} and 1-hour L_{eq} for the noise measurement period as well as for the noise metrics for each hour of the noise measurement.

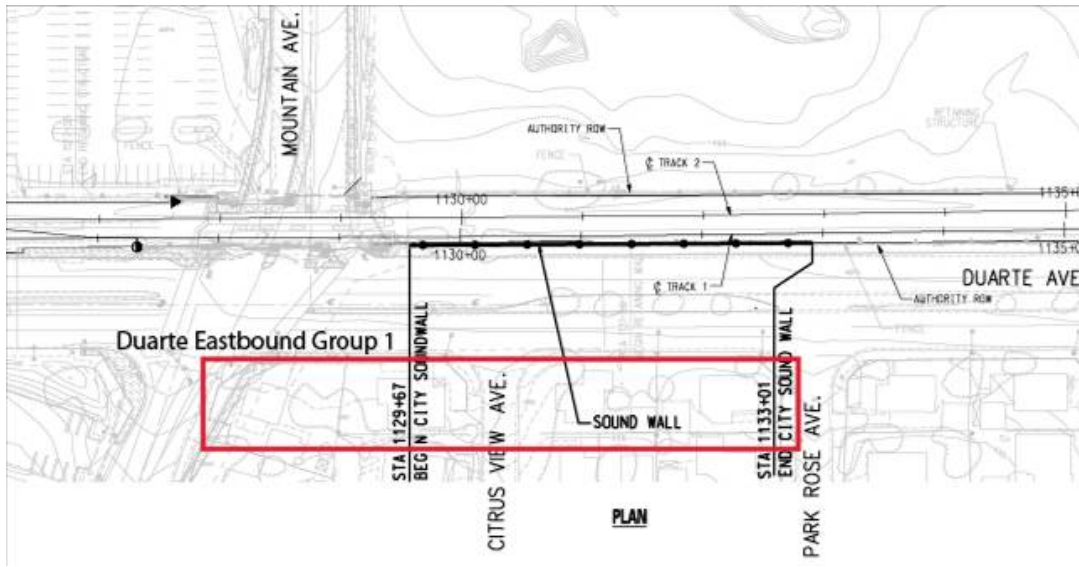
Figure 3.1-5: Measurement Location at 1609 Denning Avenue



Eliminating Sound Barrier (Duarte Eastbound Group 1) in the City of Duarte

The 2007 Final EIR included Mitigation Measure N-3, which would result in the construction of a 334-foot long sound barrier along the eastbound track in the City of Duarte. Figure 3.1-6 shows the location of the proposed sound barrier and the residential cluster (boxed in red) used in the 2007 Final EIR noise analysis. This residential cluster was labeled the Duarte Eastbound Group 1 and includes four, single-family residences located closest to the proposed tracks along Duarte Road from Mountain Avenue to Park Rose Avenue. The nearest residence in the Duarte Eastbound Group 1 is 120 feet from the centerline of the eastbound track.

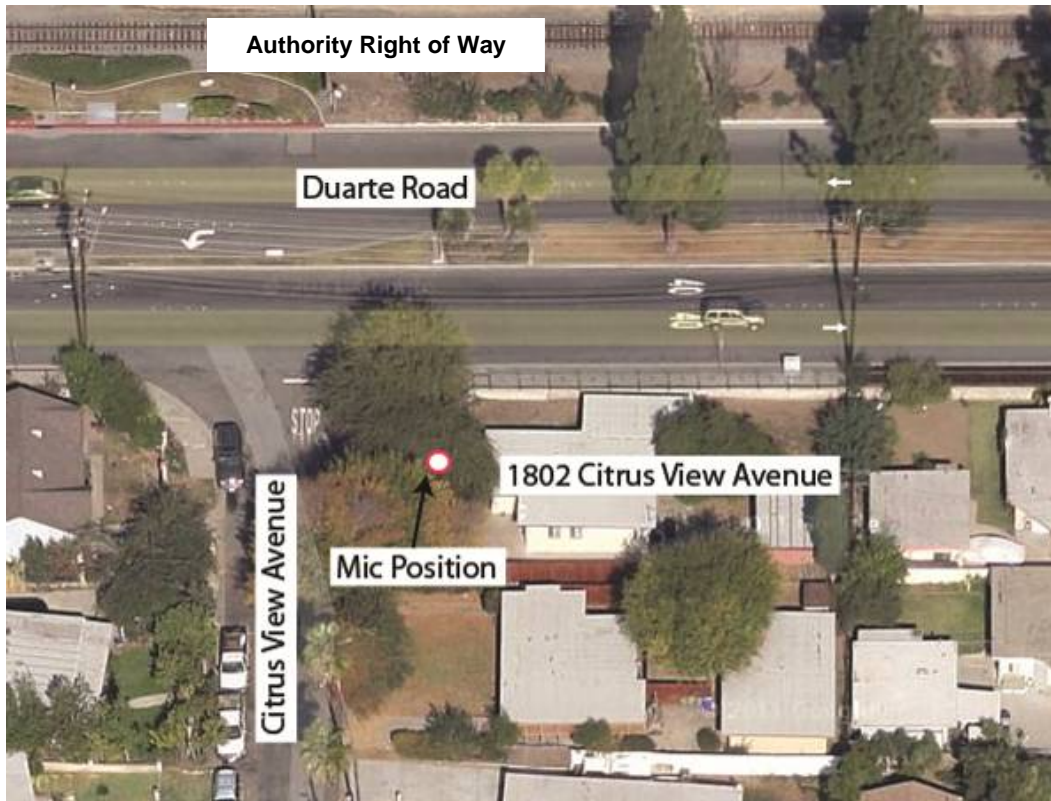
Figure 3.1-6: Location of Duarte Eastbound Sound Wall 1



To arrive at this recommendation, the 2007 Final EIR noise analysis used a noise measurement taken in 2005 at the intersection of Duarte Road and Broadland Avenue, which was approximately 0.5 mile east of these residences, to determine the FTA noise impact threshold for the residences in the Duarte Eastbound Group 1. The predicted noise level for the residences in the Duarte Eastbound Group 1 was determined to be one decibel below the FTA impact threshold. However, mitigation was recommended in the form of a sound barrier.

The Authority has subsequently reviewed the 2007 Final EIR recommendations, assumptions, and prediction calculations from the original noise analysis. Additionally, a 24-hour noise measurement was conducted at the intersection of Duarte Road and Citrus View Avenue in July 2011 to update the noise analysis. Figure 3.1-7 shows the location of the measurement at 1802 Citrus View Avenue, where the microphone was approximately 50 feet south of the centerline of the near lane of Duarte Road. The measured L_{dn} was 63 dBA. Refer to Appendix A for the measured 1-second L_{eq} and 1-hour L_{eq} for the noise measurement period as well as for the noise metrics for each hour of the noise measurement.

Figure 3.1-7: Measurement Location at 1802 Citrus View Avenue



Mitigating Vibration Impacts for a Single-family Residence in the City of Azusa

The affected receiver is a single-family residence located near the intersection of the rail right-of-way with North Angeleno Avenue. This residence is in a residential cluster labeled the Azusa Westbound Group 1. The location of the residence relative to the proposed track alignment is shown in Figure 3.1-7, with the inbound tracks located 15 feet from the residence, resulting in high vibration levels. Vibration impacts are discussed in the *Environmental Impact* section below. Environmental Impacts

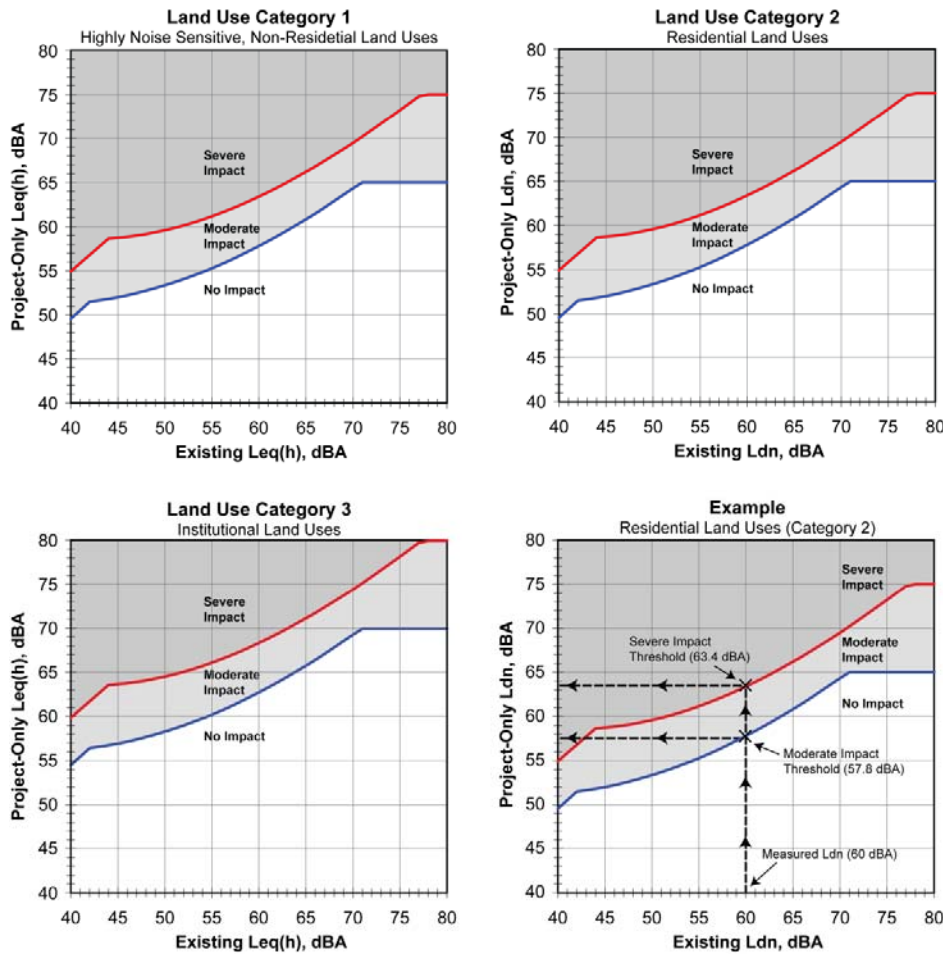
3.1.3 Environmental Impacts

3.1.3.1 Impact Criteria

The FTA noise impact criteria are a sliding scale that is based on the existing noise exposure at the sensitive receiver. The basic concept of the sliding scale is that more project noise is allowed in areas where existing noise is higher, but the allowable increase above the existing noise exposure decreases as the existing noise exposure increases.

The criteria are shown graphically in Figure 3.1-10 for three land use categories, along with an example of how the criteria are applied. The top two graphs show the Category 1 and 3 thresholds, used for nonresidential land uses, where L_{eq} is applied as the noise exposure metric. The bottom left graph shows Category 2 thresholds, used for residential land uses, where L_{dn} is applied as the noise exposure metric.

Figure 3.1-8: FTA Noise Thresholds



The concept of a sliding scale for noise impact can be difficult to grasp and may be clarified by the example illustrated in the bottom right graph of Figure 3.1-8. Assume that the existing day-night noise level (L_{dn}) has been measured to be 60 dBA. This is the total noise from all existing noise sources over a 24-hour period, which might include traffic, aircraft, lawnmowers, birds chirping, etc. Starting at 60 dBA on the horizontal axis, follow the vertical line up to where it intersects with the moderate and severe impact curves. Then refer to the left axis to read off the impact thresholds. As shown in the example, an existing noise of 60 dBA L_{dn} gives thresholds of a 2 dB increase for a moderate impact and a 5 dB increase for a severe impact. If the predicted increase in noise exceeds the moderate threshold, noise mitigation must be considered. If the predicted increase exceeds the severe threshold, noise mitigation must be included in the project unless there are compelling reasons why mitigation is infeasible.

3.1.3.2 Project Impacts

Adding TPSS in Various Cities within Phase 2A

The FTA Guidance Manual does not include separate noise thresholds for TPSS unit noise because FTA criteria are designed for train operations with intermittent sound events throughout the day. A

TPSS unit, in contrast, usually runs continuously while light rail vehicles are in operation. As defined in the 2007 Final EIR *Noise and Vibration Technical Report*, more stringent noise-level thresholds than the FTA criteria are often applied to assess noise impacts from a TPSS unit because the TPSS unit has different sound characteristics than a light rail vehicle. The 2007 Final EIR noise-level target is 10 decibels (dB) above the hourly 90 percent exceeded level (L_{90}), with a minimum limit of 45 dBA at any one residence.

As discussed, the FTA noise criteria are based on the existing noise exposure. The results for the 24-hour noise measurements presented above are used to determine the FTA noise impact thresholds at the residences nearest to each TPSS unit. The noise measurement results were also used to determine the L_{90} plus 10 dBA noise threshold goal. Table 3.1-1 lists the noise thresholds based on the measurement data.

Table 3.1-1: Noise Threshold for the Michillinda TPSS (TPSS No. 0) and Soldano TPSS (TPSS No. 8A) Units

City	TPSS Unit	Distance	Existing L_{dn}	FTA Criteria L_{dn}	Measured L_{90} (hour)	Noise Level Threshold: L_{90} (hour) + 10 dBA
Near Pasadena	Michillinda TPSS Alternative A	15 feet	66 dBA	62 dBA	51 dBA	61 dBA
Near Pasadena	Michillinda TPSS Alternative B	10 feet	66 dBA	62 dBA	51 dBA	61 dBA
Near Pasadena	Michillinda TPSS Alternative C	60 feet	57 dBA	57 dBA	42 dBA	52 dBA
Azusa	Soldano TPSS	55 feet	57 dBA	57 dBA	40 dBA	50 dBA

In addition to the impact criteria in the FTA Guidance Manual, each city has noise ordinances that stipulate acceptable noise levels that should be considered for TPSS noise because TPSS units are permanently located within the city and run continuously. The noise limits from the applicable city ordinances for the Michillinda TPSS and Soldano TPSS units are presented in Table 3.1-2.

Table 3.1-2: Applicable City Noise Ordinance Thresholds

City	TPSS	Applicable City Threshold
Pasadena	Michillinda TPSS Alternative A and Alternative B	61 dBA ^a
Pasadena	Michillinda TPSS Alternative C	53 dBA ^a
Azusa	Soldano TPSS	50 dBA

^a The Pasadena noise threshold is the ambient level plus 5 dB. The lowest ambient 1-hour L_{eq} was used.

For the Project, TPSS unit design would comply with the Metro Design Criteria for transit system ancillary facilities (Table 3.1-3). Under these criteria, the TPSS unit could not exceed a maximum noise level of 45 dBA at a distance of 50 feet from the unit or at the setback line of the nearest

building, whichever is closer. The residences near all TPSS unit locations are considered *average residential*, and it is assumed that the TPSS units would run continuously.

Table 3.1-3: Metro Noise Design Criteria for Transit Ancillary Facilities

Community Area	Maximum Noise Level ^a	
	Transient	Continuous
Low Density Residential	50 dBA	40 dBA
Average Residential	55 dBA	45 dBA
High-density residential	60 dBA	50 dBA
Commercial	65 dBA	55 dBA
Industrial/highway	75 dBA	65 dBA

Source: Metro 2009.

^a Maximum noise level at a distance of 50 feet, or at the setback line of the nearest building, whichever is closer.

The Metro Design Criteria are presented in terms of an equivalent noise level (L_{eq}). To compare the criteria to the FTA noise-impact thresholds, the criteria are converted to day-night noise level measurement (L_{dn}). Table 3.1-4 lists the results of this conversion. As such, the predicted noise-level of the Michillinda TPSS alternative units and the Soldano TPSS unit do not exceed the FTA criteria.

Table 3.1-4: Predicted TPSS Noise Levels (L_{dn})

TPSS	FTA Criteria L_{dn}	Predicted Noise-level L_{dn} ^a
Michillinda TPSS Alternative A	62 dBA	51 dBA
Michillinda TPSS Alternative B	62 dBA	51 dBA
Michillinda TPSS Alternative C	57 dBA	51 dBA
Soldano TPSS	57 dBA	51 dBA

^a The predicted level is based on the Metro Design Criteria of an L_{eq} of 45 dBA at the nearest residence.

Table 3.1-5 lists Metro Design Criteria noise-level thresholds, the applicable city’s noise-level thresholds, and the noise threshold L_{90} plus 10 dBA. Metro Design Criteria are less than the applicable city’s noise thresholds and the L_{90} plus 10 dBA threshold.

Table 3.1-5: Predicted TPSS Noise Levels (L_{eq})

TPSS	Noise Level Threshold: L_{90} (hour) + 10	City of Pasadena Threshold	Predicted TPSS Noise Level ^a
Michillinda TPSS Alternative A	61 dBA	61 dBA (Pasadena)	45 dBA
Michillinda TPSS Alternative B	61 dBA	61 dBA	45 dBA
Michillinda TPSS Alternative C	52 dBA	53 dBA	45 dBA
Soldano TPSS	49 dBA	50 dBA (Azusa)	45 dBA

^a The predicted level is based on the Metro Design Criteria of a maximum sound level of 45 dBA at the nearest residence.

By applying Metro Design Criteria to the installation of the TPSS units, the noise from the units will be less than the FTA noise thresholds, the stricter noise threshold of L_{90} plus 10 dBA, and the noise

limit for each applicable city. Therefore, the operation of all Michillinda TPSS alternative units and the Soldano TPSS unit would not have a significant impact on nearby noise-sensitive receivers.

Relocating the Duarte Station Parking Facility in the City of Duarte

As noted, the Duarte Station parking facility Alternative A and Alternative B sites would be located on a currently paved parking facility for the GE Aviation building surrounded by commercial land uses. FTA noise criteria do not consider commercial land uses as noise-sensitive areas. Furthermore, the site originally considered for the Duarte Station parking facility in the 2007 Final EIR is now being used by a nearby car dealership for vehicle storage. When the Project Refinement is implemented, this lot may be converted into a parking facility for GE Aviation to replace the parking facility currently in use, if required. However, this will not result in a change to the noise environment at the nearest noise-sensitive receivers because the dominant noise source in the area was and would continue to be traffic from Interstate 210 (located approximately 300 feet north of the noise measurement) as well as vehicular traffic on Denning Avenue and Business Center Drive. Therefore, the operation of Alternative A or Alternative B would not have a significant impact on noise-sensitive receivers, and no additions or changes to the 2007 Final EIR mitigation measures are necessary with the proposed relocation of the Duarte Station parking facility from the site initially proposed in the 2007 Final EIR.

Eliminating Sound Barrier (Duarte Eastbound Group 1) in the City of Duarte

As noted, the measured L_{dn} was 63 dBA at the location pictured in Figure 3.1-6.¹ The FTA noise thresholds for a residential land use with an L_{dn} of 63 dBA are:

- Moderate Impact Threshold: 60 dBA
- Severe Impact Threshold: 65 dBA

If the predicted noise level associated with the LRT exceeds the moderate impact threshold, FTA guidance is to consider noise mitigation options. If the predicted noise level exceeds the severe impact threshold, FTA guidance is to include mitigation in the project unless there are compelling reasons why mitigation is infeasible. Per the 2007 Final EIR, no impacts are anticipated to occur at the Duarte Eastbound Group 1. Since this time, the Authority has conducted additional measurements to determine existing noise levels. Table 3.1-6 lists the assumptions for the noise prediction (train speed and distance from the residences to the track) as well as the threshold and predicted noise level. The predicted noise level is 59 dBA, which is one decibel below the threshold for moderate impact.

¹ Detailed measurement results are presented in Appendix A.

Table 3.1-6: Noise Prediction for the Duarte Eastbound Group 1

Engineering Station:	1129+67 -1133+01
Speed:	55 miles per hour
Distance to Near Track:	120 feet
Existing Noise Level (L _{dn}):	63 dBA
Threshold for Moderate Impact (L _{dn}) ¹ :	60 dBA
Predicted Project Noise Level (L _{dn}) ¹ :	59 dBA

¹ L_{dn} is the day-night sound level.

Although the sound wall was suggested mitigation in the 2007 Final EIR, no mitigation is needed because noise levels are below FTA thresholds. A more detailed discussion of the analysis completed for Duarte Eastbound group 1 is included in Appendix A.

Vibration Mitigation for the Single-family Residence in the City of Azusa

Per the 2007 Final EIR, there is the potential for 88 residual vibration impacts. As stated in the 2007 Final EIR, more detailed site specific testing would occur during final design for vibration impact analysis. A detailed discussion of changes to the vibration analysis as a result of design refinements is presented in the technical memorandum “*Updated Vibration Predictions for Metro Gold Line Phase 2A, Pasadena to Azusa*” dated November 17, 2010. During follow-up analysis, the Authority determined that residual vibration impacts would be reduced to less-than-significant levels with implementation of the approved mitigation measures at all but one residence. The proposed vibration mitigation measure for the majority of the Project is a 12-inch layer of tire-derived aggregate under the ballast. For this residence, vibration analysis showed that predicted vibration levels with mitigation would still exceed FTA impact criteria at the single-family residence described above in the City of Azusa (Azusa Westbound Group 1) (ATS 2011). Table 3.1-7 lists the predicted vibration levels at this residence with and without the mitigation included in the 2007 Final EIR.

Table 3.1-7: Vibration Prediction for Single-family Residence

Speed:	55 miles per hour
Distance to Near Track:	15 feet
Threshold ¹ :	72 VdB
Predicted Vibration Level: ¹	88 VdB
Predicted Vibration Level with 2007 Final EIR Mitigation Measures: ¹	79 VdB

¹ Band maximum vibration velocity in decibels using a decibel reference of 1 µin/sec
 Note: VdB = vibration decibels.

Without vibration mitigation, vibration levels are predicted to reach 88 vibration decibels (VdB), which is higher than the vibration levels predicted in the 2007 Final EIR. As shown, even with implementation of 2007 mitigation measures, vibration levels at this residence would still exceed the FTA impact criteria by 7 VdB. Therefore, further vibration mitigation must be considered.

A floating slab trackway will provide substantially more vibration mitigation than tire derived aggregate. However, floating slabs are much more expensive and are higher maintenance. Table 3.1-8 lists the predicted vibration levels at Azusa Westbound Group 1 without mitigation, with tire



derived aggregate, and with a floating slab. The predicted vibration level with a floating slab is below the FTA vibration threshold for impact. Alternative mitigation measures to a floating slab are the acquisition of the property or to purchase or negotiate a vibration easement with the current landowner, and these alternative measures would comply with the FTA limits on vibration levels. The property acquisition or the easement would create a “buffer zone” between the trackway and any vibration-sensitive receivers adjacent to the impacted residence.

Table 3.1-8: Summary of Vibration Prediction

City	Azusa
Direction	Westbound
Group Number	1
Engineering Station	1368+0
Distance to Track	15 feet
Predicted Level ¹	88 VdB
FTA Threshold	72 VdB
Predicted Level ¹ with TDA ²	79 VdB
Predicted Level ¹ with Floating Slab ³	66 VdB
Predicted Level with Easement	N/A
Predicted Level with Acquisition	N/A

Notes: ¹ Vibration velocity level in maximum 1/3 octave band, decibel reference level of 1 µin/sec

² TDA (tire derived aggregate) is shredded tires installed under the ballast as a vibration mitigation measure.

³ A floating slab system with a resonance frequency of 10 Hz is assumed for this analysis.

3.1.4 Mitigation Measures

Beyond mitigation to reduce vibration impacts to the single-family residence in the City of Azusa, no additional mitigation measures are required. However, all related mitigation measures from the 2007 Final EIR and the 2011 Supplemental EIR No. 1 would still apply to the Project as approved in 2007 and to these Project Refinements as applicable.

To mitigate vibration impacts on the single-family residence in the City of Azusa, the following Mitigation Measure N-10 is proposed.

N-10 Because the single-family residence is located so close to the proposed track alignment, the Authority shall construct a floating slab, acquire the property, or negotiate a vibration easement to create a “buffer zone” between the track and any vibration-sensitive receivers adjacent to the impacted residence. The first two proposed mitigation approaches meet the same performance standard of reducing the projected vibration level at the single-family residence to 72 VdB or less. The third proposed mitigation approach mitigates the impact because the Authority would gain the right to impact the property. Subsequently, all three approaches would mitigate the vibration impact.

3.1.5 Impact Results with Mitigation

With implementation of all applicable mitigation measures, any potential Project impact to noise and vibration would be reduced to less-than-significant levels.

3.2 Cultural Resources

The cultural resources section discusses existing cultural resources and analyzes potential cultural resource impacts related to the implementation of the Project Refinements.

3.2.1 Methodology and Definitions

Several cultural resources studies were conducted for the Project Refinements by a team of qualified archaeologists, historians, and architectural historians between June and August of 2011. As a part of the cultural resources study, a record check was conducted at the South Central Coastal Information Center (SCCIC) at California State University, Fullerton to determine the locations of previously recorded resources and previous surveys conducted in or near the Project Refinement sites, including checking the SCCIC files and maps for previously identified historical or archaeological resources.

Historical and archaeological resources include properties designated as California Historical Landmarks and California Points of Historical Interest as well as those listed in the National Register of Historic Places, the California Register of Historical Resources, and the California Historical Resources Inventory. As a part of the records search process, previous studies completed for various components of the Project were reviewed for pertinent materials.

Historical background research for this study was conducted based on published literature in local and regional history and historic maps of the San Gabriel Valley region, particularly the U.S. Geological Survey's topographic maps from the early and mid-20th century, which show cultural features in and near the Project Refinement sites in detail. Sources consulted for more specific and in-depth research on historic-period buildings identified from the Project Refinement sites included primarily the archival records of the County of Los Angeles, the City of Monrovia, and the City of Azusa, particularly property assessment records and building safety records.

A field survey was also conducted on four of the Project Refinement sites in June and July 2011. No cultural resource studies were conducted for the elimination of the sound barrier (Duarte Eastbound Group 1) in the City of Duarte because the removal of the sound barrier will not affect the existing nature of the formally proposed site. The cultural resource technical report can be found in Appendix B.

3.2.2 Existing Conditions

Adding TPSS in Various Cities within Phase 2A

This section describes the existing conditions for all three alternative site locations for the Michillinda TPSS unit as well as for the Soldano TPSS unit.

All three proposed Michillinda TPSS alternatives would be located in Los Angeles County near the City of Pasadena. The land use for Alternative A is currently a single-family residence. The residence is situated about 150 feet north of the former Atchison, Topeka, and Santa Fe Railway and across the street from Interstate 210, on the northwest corner of the intersection of Michillinda Avenue and Arboleda Street. While three of the houses on the north side of Arboleda Street were built



between the 1920s and 1930s, the subject residence and several others residences date from the late 1940s to the 1950s. Much of the neighborhood between Michillinda Avenue and the Interstate 210 off-ramp, including all residences on the south side of Arboleda Street, were removed to accommodate freeway construction and operation. Compounded by the modernization of commercial buildings along Foothill Boulevard, the character of the area has completely changed from what it had been during the historic period.

Alternative B would occupy the southern portion of a paved parking lot within the same neighborhood as Alternative A. Both Alternative A and Alternative B do not exhibit any remnants of the native landscape, and both appear to be very low in sensitivity for archaeological remains dating to either the prehistoric or the historic period. Alternative C consists of a small, roughly triangular piece of land surrounded by freeway on- and off-ramps and covered by landscaping plants that were presumably introduced as a result of the freeway construction.

The proposed Soldano TPSS site is located northwest of the intersection of the railroad tracks and North Soldano Avenue, south of 9th Street, and in the City of Azusa. The proposed site is located in a previously disturbed area adjacent to commercial properties and multi-family apartments off North Soldano Avenue.

Relocating the Duarte Station Parking Facility in the City of Duarte

The proposed site for the Duarte Station parking facility Alternative A (east-west orientation) and Alternative B (north-south orientation) is currently an asphalt-paved parking lot (roughly 1.5 acres) that serves the existing adjacent industrial and commercial buildings, including parking for GE Aviation. The proposed site includes perimeter curbs and landscaping, and it is bounded by two streets (Highland Avenue and Business Center Drive) and two industrial buildings on the west and south (which includes GE Aviation). The site is located in a previously disturbed and cleared area, and no native soils are visible. There are a number of surrounding manufacturing buildings and structures, but no buildings, structures, objects, sites, features, or artifacts more than 50 years of age were encountered within or adjacent to the Project Refinement area.

Mitigating Vibration Impacts for a Single-family Residence in the City of Azusa

The single-family residence located on North Angeleno Avenue is a relatively small (approximately 714 square feet), one-story, single-family residence of wood-frame construction. The neighborhood in which the residence is located features mostly historic-period, single-family residences from the early and mid-20th century. Additionally, several apartment buildings of more recent origin are also present along with the Azusa City Yard, which is located across Angeleno Avenue and occupies a large portion of the neighborhood. A group of new homes was built to the south of the subject residence, across the railroad right-of-way. Several of the more substantial residences of early 20th century vintage on the eastern side of the block, facing San Gabriel Avenue, have been designated as “historical properties” by the City of Azusa, although the area as a whole does not demonstrate the potential to be considered a historic district due to the mixed characters, vintages, and property types.

3.2.3 Environmental Impacts

3.2.3.1 Impact Criteria

The following section identifies the CEQA impact criteria for cultural resources. For the purposes of the analyses, any one of the Project Refinements would have an adverse environmental impact under CEQA if it met or exceeded the following criteria:

- Causes a substantial adverse change in the significance of a historical resource.
- Causes a substantial adverse change in the significance of an archaeological resource.
- Directly or indirectly destroys a unique paleontological resource or site or unique geologic feature.
- Disturbs any human remains, including those interred outside of formal cemeteries.

According to PRC 5020.1(j), “‘historical resource’ includes, but is not limited to, any object, building, site, area, place, record, or manuscript which is historically or archaeologically significant, or is significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California.” More specifically, the State CEQA Guidelines state that the term “historical resources” applies to any resources listed in or determined to be eligible for listing in the California Register of Historical Resources, included in a local register of historical resources, or determined to be historically significant by the Lead Agency (14 California Code of Regulations 15064.5(a)(1)-(3)).

Regarding the criteria for the evaluation of historical significance, the CEQA Guidelines state that “a resource shall be considered by the lead agency to be ‘historically significant’ if the resource meets the criteria for listing on the California Register of Historical Resources” (14 California Code of Regulations 15064.5(a)(3)). A resource may be listed in the California Register if it meets any of the following criteria:

- Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage.
- Is associated with the lives of persons important in our past.
- Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values.
- Has yielded, or may be likely to yield, information important in prehistory or history.

3.2.3.2 Project Impacts

Adding TPSS in Various Cities within Phase 2A

According to SCCIC records, none of the three Michillinda TPSS alternative sites were previously surveyed for cultural resources. Within a 1-mile radius, a large area on the east side of Michillinda Avenue was included in an overview study for the City of Arcadia General Plan, and 13 other previous studies were identified in the SCCIC records, all of them covering small parcels of land, such as sites of bridges and telecommunication towers, or linear features, including the Interstate 210 freeway right-of-way.

As a result of these and other similar studies, six cultural resources dating to the historic period were previously recorded within the 1-mile scope of the records search. Three of these were single-family residences; one was a multilevel strip mall; and one represented the Santa Fe Railway depot at Santa Anita, which has been moved to the Los Angeles County Arboretum in the City of Arcadia and designated a California Point of Historical Interest. The sixth site was a National Register-eligible complex known as Anoakia, which was formerly a private residence but was used as a pre-school and elementary school when recorded in 1977. None of these sites are located within or adjacent to any of the Michillinda TPSS alternative sites, and no prehistoric archaeological sites have been recorded within the scope of the records searched.

The residence on Arboleda Street, which is the proposed location of the Alternative A site, does not meet the State of California's official definition of a "historical resource" (as provided in the CEQA Guidelines), and the potential impact of the Project Refinement would not constitute a "substantial adverse change in the significance of a historical resource." Therefore, the construction and operation of the Alternative A unit would not have a significant impact on cultural resources.

A cultural resources study was also conducted for the Alternative B site, which is in the same neighborhood as the Alternative A site, and no cultural or historical resources were encountered during the course of the study (Appendix B). Therefore, the construction and operation of Alternative B would not have a significant impact on cultural or historical resources.

During field surveys, it was observed that the Alternative C site is highly disturbed from landscaping and other related activities associated with initial construction and on-going operation of the three Interstate 210 on- and off-ramps. The field survey indicated that no cultural resources were present within the Project Refinement area, and it was unlikely that significant cultural resources are present below the ground. Therefore, the construction and operation of Alternative C would not have a significant impact on cultural or historical resources.

SCCIC records indicate that the Soldano TPSS site was not included in any previous cultural resources studies, although nearly 20 previous studies have been reported within a 1-mile radius, most of which involve relatively small parcels of land. Five historical/archaeological sites were previously recorded within a 1-mile radius of the Soldano TPSS site, all of which date to the historic period. Among them were two small refuse scatters on vacant lots, the remnants of the 1843 Covina Ditch and the 1880s through 1890s Azusa Ditch. The Azusa Civic Center complex at 213 Foothill Boulevard is now listed in the National Register of Historic Places. None of these sites were found



in the immediate vicinity of the Project Refinement area, with the nearest site being the Azusa Civic Center. The field survey produced completely negative results. Neither potential cultural resources nor any undisturbed native soils were observed on the site. Therefore, the construction and operation of the Soldano TPSS unit would not have a significant impact on cultural resources.

Relocating the Duarte Station Parking Facility in the City of Duarte

The proposed locations of the Duarte Station parking facility were included in a series of previous studies for the Project (i.e., the Draft EIS/EIR and the 2007 Final EIR). As part of the present study, the existing documentation was systematically reviewed to determine whether the Project Refinement site and both of its alternatives were adequately investigated for cultural resources. The documents reviewed included the Project's Draft EIS/EIR and a supplemental historic properties survey and effects report (Frank 2005).

Although the previous studies did not include archaeological field surveys of the Project Refinement site, record searches and building surveys were conducted for the site, and no previously recorded archaeological resources were encountered. The FTA and the California State Historic Preservation Officer previously determined, in 2004, that the Project would not result in an adverse effect on historic properties. Because the proposed Alternative A and Alternative B are located within the area covered by the previous studies, this determination is not expected to change.

A field survey confirmed that Alternative A and Alternative B would be located on an existing parking lot serving an industrial park. The entire parking lot is paved with asphalt, and no native soils are visible. Furthermore, no buildings, structures, objects, sites, features, or artifacts more than 50 years of age were encountered within or adjacent to the Project Refinement site. Therefore, the construction and operation of Alternative A and Alternative B would not have a significant impact on cultural resources.

Mitigating Vibration Impacts for a Single-family Residence in the City of Azusa

According to SCCIC records, the subject property had not been surveyed for cultural resources prior to this study, and no cultural resources had been recorded on or adjacent to the parcel. Within a 1-mile radius, SCCIC records show a total of 19 previous cultural resources studies on various tracts of land and linear features. Typical of the fully urbanized areas in the Los Angeles Basin, most of these previous studies covered rather small pieces of land; although one large-scale survey was reported on the eastern edge of the scope of the records search. The nearest among these studies were a very small survey that apparently took place on the Azusa City Yard property across the street from the subject property as well as two linear surveys along segments of Azusa Avenue (two blocks east of the parcel).

As a result of these and other similar studies in the vicinity, five historical/archaeological sites were previously recorded within the 1-mile scope of the records search, all of them dating to the historic period. Among them were two small refuse scatters on vacant lots (sites 19-002589 and 19-002590), the remnants of the 1843 Covina Ditch (Site 19-002777) and the 1880s through 1890s Azusa Ditch (Site 19-003802), and the Azusa Civic Center complex at 213 Foothill Boulevard, which is now listed in the National Register of Historic Places (Site 19-187045, National Register of Historic Places No.



02000034). None of these sites were found in the immediate vicinity of the subject property, though the nearest was the Azusa Civic Center.

The City of Azusa’s records indicate that three early 20th century residences located nearby at 811, 825, and 839 North San Gabriel Avenue, respectively, are currently designated by the City as “historical properties.” The residence under evaluation, however, is not designated as such at the present time, nor is any of the buildings on adjacent parcels along this segment of Angeleno Avenue. Several of the more substantial residences of early 20th century vintage on the eastern side of the block, facing San Gabriel Avenue, have been designated as “historical properties” by the City of Azusa, but the area as a whole, with its mixed characters, vintages, and property types, does not demonstrate the potential to be considered a historic district.

The residence at 736 North Angeleno Avenue was built around 1909, and was owned—and evidently occupied—by the Gonzales, Pasillas, and Contreras families during the historic period. It is notable that all three of these owners/occupants are apparently of Hispanic heritage, and their association with the property coincided with the acceleration of Azusa’s long relationship with the Hispanic culture through the influx of Mexican immigrants during the early 20th century. In that sense, the residence is arguably associated with “a pattern of events or a historic trend that made a significant contribution to the development of a community” (NPS 1991).

However, as one of the numerous residential buildings in the City of Azusa that date to that period, this house does not demonstrate a unique or particularly close association with the pattern of events identified above, as required by guidelines adopted for the California Register of Historical Resources (NPS 1991). For instance, in terms of design, construction, materials, and general appearance, this house is typical of modest residences in the U.S. that date to the early 20th century, and exhibits no Hispanic influence in its exterior characters. In comparison to the other buildings of similar vintage in the City of Azusa, its association with the Hispanic theme in local history does not appear to be of any special significance, nor is there any evidence that it is associated with a specific event of importance.

Therefore, the single-family residence located on North Angeleno Avenue does not demonstrate the necessary historical, architectural, or aesthetic qualities to be considered eligible for listing in the California Register of Historical Resources. Furthermore, the residence is not listed in a local register of historical resources. Based on these considerations, the residence at 736 North Angeleno Avenue does not appear to meet CEQA’s definition of a “historical resource,” and, therefore, any potential impacts on the residence would not constitute “a substantial adverse change in the significance of a historical resource.” No further cultural resources investigation is recommended on this structure since it would not have a significant impact on cultural resources.

3.2.4 Mitigation Measure

Because no historical or cultural resources were encountered during the field surveys of any of the Project Refinement sites, no additional mitigation measures are required. However, all related mitigation measures from the 2007 Final EIR and the 2011 Supplemental EIR No. 1 would still apply to the Project as approved in 2007 and to these Project Refinements as applicable.

3.2.5 Impact Results with Mitigation

With implementation of all applicable mitigation measures, any potential Project impacts to cultural resources would be reduced to less-than-significant levels.



3.3 Geological and Hazardous Materials

This section discusses potential geological and hazardous material conditions and analyzes potential geological and hazardous material impacts from implementation of the Project Refinements.

3.3.1 Methodology and Definitions

In assessing any potential geological and/or hazardous materials impacts related to the Project Refinements, a review of the 2007 Final EIR and other applicable Environmental Site Assessments (ESAs) was performed. In addition to the 2007 Final EIR, documents reviewed include the Phase 1 ESA (Leighton 2003), a draft Phase 2 ESA (Leighton 2005), a Phase 1 ESA for a Railcar Storage Site at Duarte Road and California Avenue in the City of Monrovia (Stantec 2010), a Phase 1 ESA of 1675 South Primrose Avenue in the City of Monrovia (Hunter 2006), and the Hazardous Materials Evaluation reports prepared for the Project Refinements (Appendix C). Based upon the findings of these reports, impacts for the Project Refinements were evaluated with respect to the potential to expose humans and/or the environment to hazards or hazardous materials during construction activities and after completion of the Project Refinements.

A study was not conducted for the elimination of a sound barrier (Duarte Eastbound Group 1) in the City of Duarte because the existing conditions would not be altered. A study was also not conducted for the Soldano TPSS because this site was previously evaluated under the 2007 Final EIR Addendum No. 2, where it was determined that the site would have no significant hazardous impacts.

3.3.2 Existing Conditions

Adding TPSS in Various Cities within Phase 2A: Michillinda TPSS (TPSS No. 0)

This section describes the existing conditions for all three alternative site alternatives for the Michillinda TPSS unit.

The Michillinda TPSS Alternative A site is currently occupied by a one-story, wood frame, single-family residence that was originally built in 1948 according to the Los Angeles County Assessor. The site is bounded by two streets, a commercial bank, and residential property. The property has a detached garage and built-in swimming pool in the rear yard. A concrete driveway enters the property from the street (Arboleda Avenue) and an alley is present behind the parcel. The front yard is covered in irrigated landscaping. A masonry block wall marks the perimeter of the property on the east and north sides.

Alternative B site is currently occupied by a paved parking lot with perimeter curbs, retaining walls, and landscaping. The site is bounded by two streets, a commercial shopping center, and a residential property.

Alternative C site is a triangular parcel between two on-ramps and an off-ramp for eastbound traffic on Interstate 2010. The site is currently covered by irrigated landscaping, contains several sizable trees, and is raised above surrounding grades.



Relocating the Duarte Station Parking Facility in the City of Duarte

The proposed site for the Duarte Station parking facility Alternative A (east-west orientation) and Alternative B (north-south orientation) is occupied by a paved parking lot (roughly 1.5 acres) that serves the existing adjacent industrial and commercial buildings, including parking for GE Aviation. The proposed site includes perimeter curbs and landscaping, and it is bounded by two streets (Highland Avenue and Business Center Drive) and two industrial buildings on the west and south (which includes GE Aviation). The sites are located in a previously disturbed and cleared area.

Mitigating Vibration Impacts for a Single-family Residence in the City of Azusa

The site is currently occupied by a one-story, wood-frame, single-family residence that was originally built in 1901 and modified in 1927 according to the Los Angeles County Assessor. Two small sheds are present in the rear yard. A concrete driveway enters the property from an alley at the rear of the parcel. The remainder of the parcel is covered in irrigated landscaping. A metal-chain link fence surrounds the perimeter of the property.

3.3.3 Environmental Impacts

3.3.3.1 Impact Criteria

The following section identifies the CEQA impact criteria for hazards and hazardous materials. For the purposes of the analyses, the Project Refinements would have an adverse environmental impact under CEQA if they met or exceeded the following criteria:

- Creates a significant hazard to the public or the environment through the routine transport, use or disposal of hazardous materials
- Creates a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment
- Emits hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school
- Is located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would create a significant hazard to the public environment
- Is located within an airport land use plan, or where such a plan has not been adopted, within 2 miles of a public airport or public use airport, resulting in a safety hazard for people residing or working in the Project area
- Is located within the vicinity of a private airstrip, resulting in a safety hazard for people residing or working in the Project area
- Impairs implementation of or physically interferes with an adopted emergency response plan or emergency evacuation plan

- Exposes people or structures to a significant risk of loss, injury, or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands.

3.3.3.2 Project Impacts

Adding TPSS in Various Cities within Phase 2A: Michillinda TPSS (TPSS No. 0)

A geological and hazardous materials evaluation was conducted for the Michillinda TPSS Alternative A, B, and C sites (Appendix C). This evaluation revealed that past earthwork may have occurred to level the Alternative A site, which primarily consists of Quaternary alluvium beneath the surface fill soils. Regarding Alternative B and based on recent field surveys and historical aerial photographs, ground disturbances have occurred in the area from the construction of the current commercial structure and the paved parking lot. Lastly, based on recent field surveys and historical aerial photographs, ground disturbances have occurred in the area of the Alternative C site from the construction of the adjacent freeway on- and off-ramps, and the site is likely occupied by a thick embankment of compacted fill placed during the construction of Interstate 210, which is all underlain by Quaternary alluvium.

All three alternative sites do not fall within a liquefaction or seismic slope hazard zone or within an earthquake fault rupture zone. There were also no significant variations to the geologic site conditions as described in the 2007 Final EIR, the 2007 Final EIR Addendum No. 1 and Addendum No. 2, and the 2011 Supplemental EIR No. 1.

Additionally, record searches of potential properties of concern at or around all three alternative sites revealed two properties within approximately 500 feet of the sites, but database results revealed both properties to be service stations with leaking underground storage tanks that have caused minimal soil contamination and whose cases have both been closed (Appendix C). Furthermore, the Phase 1 ESA (Leighton 2003) and Phase 2 ESA (Leighton 2005) did not identify evidence of hazardous material at or around any of the alternative sites.

As for Alternative A site conditions, the use, storage, or disposal of hazardous material was not observed. Areas of staining or stressed vegetation were not observed. While the residential structure may contain asbestos and lead-based paint (due to the age of the building) as well as small quantities of typical household hazardous materials (e.g., pesticides, herbicides, paints, fuels, and pool disinfectants), each would not be in a large enough quantity to cause a significant impact. Concerning Alternative B site conditions, the use, storage, or disposal of hazardous material was not observed, and areas of staining or stressed vegetation were also not observed. Concerning Alternative C site conditions, the cover of a monitoring well was observed in the southern portion of the proposed site between Interstate 210 on- and off-ramps. Monitoring wells are usually installed to monitor groundwater contamination, and this specific well has a head that is roughly 18 inches in diameter and set in 24 inches of concrete. Because construction would be above the groundwater (90 to 100 feet below surface), there is an extremely low probability of excavating into any groundwater or contaminated groundwater. In addition the deepest excavation (approximately 5 feet) is on the northern portion of the site, which is a significant distance from the monitoring well. The Authority anticipates avoiding the monitoring well if still in use or closing the well in

accordance with state regulations if no longer in use. There was also potential trash and debris that should be removed and disposed of in accordance with state regulations. The use, storage, or disposal of hazardous material was not observed, and areas of staining or stressed vegetation were also not observed.

Therefore, the construction and operation of all three alternatives would not have a significant impact on geological or hazardous materials

Relocating the Duarte Station Parking Facility in the City of Duarte

A geological and hazardous materials evaluation was conducted for the Duarte Station parking facility Alternative A (east-west orientation) and Alternative B (north-south orientation) sites. Some minor earthwork likely occurred at the site (which is underlain by Quaternary alluvium) to level it during construction of the parking lot. The site does not fall within a liquefaction or seismic slope hazard zone or within an earthquake fault rupture zone. There were also no significant variations to the geologic site conditions as described in the 2007 Final EIR, the 2007 Final EIR Addendum No. 1 and Addendum No. 2, and the 2011 Supplemental EIR No. 1.

A record search of potential properties of concern at or around the Project Refinement revealed one property within approximately 500 feet of the site, but database results revealed that the property had no evidence of contamination. The Phase 1 ESA (Leighton 2003) and Phase 2 ESA (Leighton 2005) did not identify any significant hazardous material concerns at or around the 2007 Final EIR proposed site.

As for site conditions, the use, storage, or disposal of hazardous material was not observed, and areas of staining or stressed vegetation were also not observed. Other issues of concern regarding hazardous materials were not identified at either of the alternative sites. Therefore, the construction and operation of Alternative A or Alternative B would not have a significant impact on geological or hazardous materials.

Mitigating Vibration Impacts for a Single-family Residence in the City of Azusa

Based on site topography and surface observations, it appears that no significant earthwork (grading, cuts or fills) likely occurred at this site during the original house construction, which is underlain by Quaternary alluvium. The site falls within a liquefaction hazard zone as defined by the California Geological Survey, which would require specific geotechnical studies for any proposed construction at this site. However, the site does not fall within a seismic slope hazard zone or within an earthquake fault rupture zone. There was also no significant variations to the geologic site conditions as described in the 2007 Final EIR, the 2007 Final EIR Addendum No. 1 and Addendum No. 2, and the 2011 Supplemental EIR No. 1.

A record search of potential properties of concern at or around the Project Refinement revealed one property within approximately 500 feet of the site, but database results revealed that the property has a leaking underground storage tank with some gasoline release (Appendix C). While the Phase 1 ESA (Leighton 2003) did not address the subject site, it did report a leaking underground storage tank between 500 to 700 feet from the site. The Phase 2 ESA (Leighton 2005) noted soil samples and borings that were conducted along the proposed rail alignment just south and east of the site,

where somewhat elevated concentrations of heavy petroleum hydrocarbons (typical near railways) were found in shallow soils along with somewhat elevated concentrations of barium. However, both hydrocarbons and barium would be remediated at the time of construction.

As for the site itself, the use, storage, or disposal of hazardous material was not observed, and areas of staining or stressed vegetation were not observed. Other issues of concern regarding hazardous materials were not identified at the single-family residence.

Therefore, any potential impacts on the single-family residence would be reduced to less-than-significant levels by applying mitigation measures as described in the Mitigation Measure section below.

3.3.4 Mitigation Measures

While no additional mitigation measures are required due to the Project Refinements, mitigation measures to reduce impacts to the single-family residence in the City of Azusa are from the 2007 Final EIR Hazardous Materials mitigation measures (HZ-1 through HZ-10). Beyond this, all related mitigation measures from the 2007 Final EIR and the 2011 Supplemental EIR No. 1 would still apply to the Project as approved in 2007 and to these Project Refinements as applicable.

3.3.5 Impact Results with Mitigation

With implementation of mitigation measures HZ-1 through HZ-10 and compliance with federal, state, and other applicable regulatory requirements, potential geological and hazardous materials impacts would be reduced to less-than-significant levels.

3.4 Traffic and Transportation

The traffic and transportation resource section discusses the existing traffic environment and analyzes potential traffic impacts related to the implementation of the applicable Project Refinements. As such, a traffic and transportation analysis was not conducted for adding TPSS units in various cities within Phase 2A, eliminating a sound barrier (Duarte Eastbound Group 1) in the City of Duarte, and mitigating vibration impacts for a single-family residence in the City of Azusa. As discussed, TPSS site access would only be necessary for installation, repair, routine maintenance, and local fire department needs, and therefore, impacts to traffic and transportation would be minimal. Additionally, eliminating the proposed sound barrier (Duarte Eastbound Group 1) in the City of Duarte and mitigating vibration impacts for a single-family residence in the City of Azusa are Project Refinements associated with mitigation measures and, therefore, would not have impacts to traffic and transportation.

3.4.1 Existing Condition

Relocating the Duarte Station Parking Facility in the City of Duarte

The proposed site for the Duarte Station parking facility Alternative A (east-west orientation) and Alternative B (north-south orientation) is currently an asphalt-paved parking lot (roughly 1.5 acres) that serves the existing adjacent industrial and commercial buildings, including parking for GE Aviation. The proposed sites include perimeter curbs and landscaping, and it is bounded by two streets (Highland Avenue and Business Center Drive) and two industrial buildings on the west and south (which includes GE Aviation).

The proposed Duarte Station parking facility would consist of 125 vehicle parking spaces at the southwest corner of the Highland Avenue and Business Center Drive intersection. The existing 125-space parking supply is proposed to be moved to the west of the GE Aviation building, with access/egress onto to Business Center Drive. The Duarte Station parking facility would increase traffic on Business Center Drive, which is analyzed below.

3.4.2 Environmental Impacts

3.4.2.1 Impact Criteria

The following section identifies the impact criteria for traffic and transportation. For the purposes of the analyses, the Project Refinements would have an adverse environmental impact under CEQA if they met or exceeded the following criteria:

- Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit
- Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards

established by the county congestion management agency for designated roads or highways.

- Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks.
- Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment).
- Result in inadequate emergency access.
- Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities.

3.4.2.2 Project Impacts

Relocating the Duarte Station Parking Facility in the City of Duarte

A traffic analysis was conducted to evaluate the traffic impacts of relocating the Duarte Station parking facility from its original planned location on the west side of the existing GE Aviation building (as defined in the 2007 Final EIR) to the east side of the GE Aviation building at the corner of Highland Avenue and Business Center Drive. The traffic analysis was based on a factoring of traffic count volumes compiled for the approved 2007 Final EIR and 2011 summer-season traffic counts conducted by KOA.²

The comparison of the traffic data indicated an increase in traffic volumes during the a.m. peak hour and a decrease in traffic volumes during the p.m. peak hour. This is in comparison to the counts conducted in the nearby City of Monrovia for other elements analyzed in the 2011 Supplemental EIR No. 1. Only the lower a.m. peak-hour traffic volumes were factored upward. This process provided year-2011 traffic counts that could be applied to the current analysis.

A number of other factors were also included in the current analysis. First, two options were analyzed for Alternative A and Alternative B to determine if any changes to traffic impacts would occur at the intersection of Highland Avenue and Business Center Drive. Option 1 analyzed the intersection as a three-leg intersection with permitted phasing, and Option 2 analyzed the intersection as a four-leg intersection with split phasing on the east and west legs. Second, access to and from the remaining GE Aviation parking lot and the parking area for businesses adjacent to GE Aviation would be maintained to both Business Center Drive and Highland Avenue. Third, the intersection at Highland Avenue and Business Center Drive is not currently signalized, although the implementation of that traffic signal was assumed in this analysis based on the proposed mitigation measure in the 2007 Final EIR that includes signalization of this intersection. Fourth, both alternatives would utilize separate driveways onto Business Center Drive (approximately 100 feet apart from the existing driveway). The increase in traffic in this location would not create any significant traffic circulation impacts, as the driveway would not overlap with any intersection approach turn pockets, nor would it interfere with any major driveways on the opposite side of the roadway. And fifth, in order to provide a conservative analysis and based the ultimate size of the

² Current existing counts in the area could not be located by the City of Duarte.

parking facility, a new parking supply of 250 spaces (125 present/125 future) was analyzed. This would incorporate the additional trip activity at some legs of the analyzed intersection caused by the shift in trips to and from the existing parking lot to Business Center Drive only. The near-term construction of Duarte Station parking facility will be limited to 125 spaces, and additional analysis will be undertaken during the planning process for the future additional spaces.

Trip Generation Estimate

As noted above, Table 3.4-1 provides a summary of the trip generation estimate, which was based on a conservatively-analyzed intensity of 250 parking spaces.

Table 3.4-1: Trip Generation Parking Lot Use

Land Use	Intensity	Units	Daily Total	AM Peak			PM Peak		
				Total	In	Out	Total	In	Out
Trip Generation Rate for Duarte Station with Parking Facility	-	Parking Spaces	251	1.07	0.80	0.20	1.24	0.58	0.42
Trip Generation Estimates for Duarte Station with Parking Facility	250	Parking Spaces	628	268	215	53	310	180	130

Source: ITE 2008.

Option 1: Permitted Traffic Signal Phasing

Under Option 1, the Project Refinement study intersection at Business Center Drive and Highland Avenue would operate as a T-intersection, with permitted phasing on all three legs. Table 3.4-2 summarizes the level of service (LOS) values during both a.m. and p.m. peak hours.

Table 3.4-2: Option 1 Future (2030) Buildout Level of Service (LOS)

Peak Hour	V/C	LOS
AM	0.521	A
PM	0.444	A

As analyzed, the intersection would operate at a good level of service (LOS A) under the future 2030 buildout year. Therefore, both Alternative A and Alternative B would not create a significant impact at the Business Center Drive and Highland Avenue intersection. Option 1’s LOS worksheets are provided within the traffic analysis technical memorandum (Appendix D).

Option 2: Split Phasing

Under Option 2, the Project Refinement study intersection at Business Center Drive and Highland Avenue would operate as a four-leg signalized intersection, with split phasing for the offset east-west leg approaches. Table 3.4-3 summarizes the LOS values during both a.m. and p.m. peak hours.

Table 3.4-3: Option 1 Future (2030) Buildout Level of Service (LOS)

Peak Hour	V/C	LOS
AM	0.699	B
PM	0.518	A

As analyzed, the intersection would operate at a good level of service (LOS B or better) under the future 2030 buildout year. Therefore, both Alternative A and Alternative B would not create a significant impact at the Business Center Drive and Highland Avenue intersection. Option 2’s LOS worksheets are provided within the traffic analysis technical memorandum (Appendix D).

3.4.3 Mitigation Measures

Because relocating the Duarte Station parking facility would not create significant traffic or transportation impacts, no additional mitigation measures are required. However, all related mitigation measures from the 2007 Final EIR and the 2011 Supplemental EIR No. 1 would still apply to the Project as approved in 2007 and to these Project Refinements as applicable.

3.4.4 Impact Results with Mitigation

With implementation of all applicable mitigation measures, any potential Project impacts to traffic and transportation would be reduced to less-than-significant levels.



3.5 Construction-related Impacts

As proposed in the 2007 Final EIR and in Chapter 2 of this Supplemental EIR No. 2, the Project will utilize a design-build method of delivery that combines the architectural/engineering design services and construction services under one contract (or under a single entity). As noted in Chapter 2, the design-build contractor would be responsible for preparing a comprehensive schedule for all activities, as well as preparing a construction management plan to address all existing and prior construction-related mitigation commitments as identified in the 2007 Final EIR, the 2007 Final EIR Addendum No. 1 and Addendum No. 2, the 2011 Supplemental EIR No. 1, and the 2011 Supplemental EIR No. 2.

Concerning specific Project Refinement construction-related impacts, there would be no construction impacts related to eliminating the sound barrier (Duarte Eastbound Group 1) in the City of Duarte. Construction-related impacts for the remaining three Project Refinements are discussed below.

3.5.1 Michillinda TPSS (TPSS No. 0) and Soldano TPSS (TPSS No. 8A) Units

It is anticipated that ground disturbance would be minimal at the Michillinda and Soldano TPSS sites because the site is located in a previously disturbed area. This activity would require implementation of construction best management practices previously identified in the 2007 Final EIR and the Mitigation Monitoring and Reporting Program for the Project to address temporary construction noise and air quality impacts, removal of vegetation, hazardous materials (should any be found/used in construction), and temporary construction impacts to water quality. TPSS construction would be temporary and would result in less-than-significant impacts to noise, air quality, hazardous material, and surface-level water/water quality impacts with the implementation of best management practices.

3.5.2 Duarte Station Parking Facility

Because the existing pavement is in fairly good condition and because Alternative A and B are currently occupied by an active, cleared parking lot consisting of approximately 150 parking spaces, there would be limited construction-related activity. This activity would require implementation of construction best management practices previously identified in the 2007 Final EIR and the Mitigation Monitoring and Reporting Program for the Project to address temporary construction noise and air quality impacts, hazardous materials (should any be found/used in construction), and temporary construction impacts to water quality. Parking facility construction would be temporary and would result in less-than-significant impacts to noise, air quality, hazardous materials, and surface-level water/water quality impacts with the implementation of best management practices.

3.5.3 Single-family Residence in the City of Azusa

Construction activity related to the floating slab has already been discussed in the 2007 Final EIR and the “*Updated Vibration Predictions for Metro Gold Line Phase 2A, Pasadena to Azusa*” dated November 17, 2010. Construction activity related to acquiring the single-family residence would require the removal of existing landscaping and the residential structure. There would be no construction activity related to negotiating an easement as the owner of the single-family residence would be compensated for the vibration impact.



With either the construction of the floating slab or the removal of the single-family residence, the overall construction impacts are similar. Both of these activities would require implementation of construction best management practices previously identified in the 2007 Final EIR and the Mitigation Monitoring and Reporting Program for the Project to address temporary construction noise and air quality impacts, removal of vegetation, hazardous materials (should any be found/used in construction), and temporary construction impacts to water quality. Vibration mitigation construction would be temporary and would result in less-than-significant impacts to noise, air quality, hazardous materials, and surface-level water/water quality impacts with the implementation of best management practices.

