2 NOISE & VIBRATION

This chapter provides additional noise and vibration impacts analysis in two areas identified by the November 2011 *Town of Atherton* rulings. In the rulings, the court held that the Program EIR's discussion of noise and vibration required further analysis in two areas: (1) noise and vibration impacts associated with potentially placing freight trains on the outside tracks of the Caltrain right-of-way, closer to adjacent residences and businesses along the San Francisco Peninsula and (2) noise and vibration impacts associated with the shift of Monterey Highway to implement the high-speed train project. Additional analysis is also provided for potentially placing freight trains closer to adjacent residences and businesses for a short portion south of San Jose. The following new text addresses these areas and adds to the 2008 Final Program EIR, Chapter 3.4. Changes to text from the Partially Revised Draft Program EIR are shown with a bar in the margin; added text is noted with underlining and deleted text is noted with strikeout.

A noise and vibration screening analysis was conducted as part of the 2008 Final Program EIR to identify potential areas of impact on sensitive receptors. The methodology, analysis, and conclusions identified in the discussion presented below were conducted to clarify and confirm the conclusions identified in the 2008 Final Program EIR. Out of an abundance of caution, additional methodology was utilized for Monterey Highway to identify whether any additional or different impacts existed or mitigation strategies beyond those previously identified should be added.

2.1 Regulatory Requirements and Methods of Evaluation (addition to Section 3.4.1 of 2008 Final Program EIR)

The methodology and CEQA significance criteria discussion presented in the 2008 Final Program EIR, Section 3.4.1 remain accurate. The reader is referred to that document for additional context for how noise and vibration impacts along the alignments in the study area were assessed as having a low, medium, or high impact rating. The following discussion adds to the discussion of methodology and clarifies the method of assessing environmental impacts for the potential movement of freight train tracks and the shift of Monterey Highway. The following text is an addition to Section 3.4.1 of the 2008 Final Program EIR.

A. POTENTIAL MOVEMENT OF FREIGHT TRAIN TRACKS DUE TO HST

As described in Chapter 3.4 of the 2008 Final Program EIR, a noise and vibration screening analysis was conducted for the HST alignment alternatives in accordance with the Federal Railroad Administration (FRA) (U.S. Department of Transportation 2005) and Federal Transit Administration (FTA) (U.S. Department of Transportation 2006) criteria and guidelines. The FRA has established criteria for assessment of noise and vibration impacts for high-speed ground transportation projects with speeds over 125 mph. In areas with train speeds that would be equal to or less than 125 mph, a corresponding screening procedure developed by the FTA was used in the assessment of the HST Alignment Alternatives.[1] For the proposed HST corridor from San Francisco to San Jose, the FTA criteria were used to assess the noise and vibration impacts associated with the HST alignment alternatives within the shared-use Caltrain corridor because it is expected that HST, Caltrain, and freight trains would all run at speeds below 125 mph. This screening level of analysis encompassed all rail activity within the corridor, including freight and passenger rail service. Therefore, potential changes in alignment of individual existing tracks (e.g., freight or passenger) within a rail corridor and/or the addition of new tracks within an existing corridor or with expansion of the corridor, do not

[1] Although the screening methodologies are the same for the FRA and FTA, the distance used to screen for a particular corridor is dependent on train speed. The FRA's guidance manual refers to the FTA's when train speeds are equal to or below 125, and the FTA's refers to the FRA guidance when speeds are above 125.

alter the methodology of a screening analysis. Table 4.1 of the FTA Guidance Manual (2006) provides screening distances for various types of rail projects involving different vehicle technologies and corridor types. The corridor between San Francisco and San Jose is an active rail corridor with passenger and limited freight service. The FTA Guidance Manual classifies this as a "commuter rail mainline" corridor and uses a screening distance of 375 feet from ~~track~~ the centerline of the guideway (i.e., alignment).[2]

By design, screening produces a conservative estimate of the number of sensitive receivers that could be affected along different corridors under consideration. Screening allows for a comparison of the potential number of impacted receivers (homes, schools, etc.) between different alternative alignments, but it is a rough measure and not intended to provide specific information on impacts to individual properties within a corridor. The method identifies all potentially impacted developed lands by type of use within the study area. Subsequent project-level analysis is likely to indicate lower levels of potential impact by consideration of structures or land forms blocking the path to the receptor.

For the screening analysis, the impact metrics and impact ratings are defined in Table 2-1 (same as Table 3.4-1 in the 2008 Final Program EIR). The rating scheme is designed to indicate the potential for noise and vibration impacts along the HST alignment alternatives.

Table 2-1
Unchanged Table 3.4-1—Ratings Used for Noise and Vibration Analysis

Rating	Impact Metric	
	Noise	Vibration
Low	Less than 80	Less than 40
Medium	80–200	40–100
High	Greater than 200	Greater than 100
Source: Authority 2008 Impact Metric = (Residential Population in the Impact Area/Mile) + 0.3 × (Mixed Use Population in the Impact Area /Mile) + (100 × Number of Hospitals in the Impact Area)/Mile + (250 × Number of Schools in the Impact Area)/ Mile		

B. POTENTIAL LANE NARROWING AND SHIFTING OF MONTEREY HIGHWAY

The noise and vibration study area for the HST project in the San Jose to Central Valley Corridor was determined using FRA's and FTA's noise screening procedure. The FRA and FTA screening distances, measured from the centerline of the HST right-of-way (i.e., alignment) adjacent to Monterey Highway, was 375 feet for the segment of Monterey Highway that would be narrowed from six lanes to four lanes and where the roadway would be shifted east. This screening distance encompassed and identified noise sensitive receptors adjacent to and well beyond the limits of potential noise exposure that would result from an eastern shift of Monterey Highway traffic lanes. The prior analysis conducted in the 2008 Final Program EIR captured the number of people that may be exposed to impact-level noise that could occur from the shifting of Monterey Highway. Out of an abundance of caution, an additional methodology based on Federal Highway Administration (FHWA) guidelines was utilized for Monterey Highway to identify whether any additional or different impacts would occur or mitigation strategies beyond those previously identified would be needed.

[2] Guideway – Supporting structure to form a track for rolling or magnetically-levitated vehicles (FTA 2006). In other words, guideway is not the track, it is the base upon which the track is placed.

In addition to noise from HST operations, noise from changes in traffic volume and major roadway realignment due to the project have been considered. Because parts of Monterey Highway would be narrowed from six lanes to four lanes and other areas would be shifted up to 60 feet closer to noise sensitive receptors to accommodate the HST alignment, the potential for traffic noise impacts resulting from these changes were considered. FRA adheres to FHWA guidance and methodology for traffic noise impact assessment when traffic noise impacts are anticipated. In contrast to FRA, FHWA does not use screening distances for initial impact assessment, but rather uses defined Noise Abatement Criteria (NAC) for assessing traffic noise impacts at noise sensitive receptors. The FHWA traffic NAC and guidance are outlined in Procedures for Abatement of Highway Traffic Noise and Construction Noise (23 CFR Part 772), which also requires that the Traffic Noise Model (TNM) be used for traffic noise assessment.

In portions of the project where Monterey Highway would be narrowed or shifted, the potential for noise impacts exists at locations where the highway lanes would be shifted closer to noise sensitive receptors. FHWA guidance regarding the physical alteration of an existing highway states that "changes in the horizontal alignment that reduce the distance between the source and the receiver by half or more result in a Type I project" (U.S. Department of Transportation 2010). By this definition, the realignment of Monterey Highway as part of the HST project would be classified as a Type I project.[3] FHWA requires identification of highway traffic noise impacts and examination of potential abatement measures for all Type I projects receiving federal-aid funds.

Vibration impact screening for highways is assumed to result in less-than-significant impacts for ground-borne vibration. In addition, FHWA does not have adopted vibration impact assessment criteria.

C. CEQA SIGNIFICANCE CRITERIA (No change from the 2008 Final Program EIR)

At the programmatic level, the project would cause a significant noise or vibration impact under CEQA if it would result in:

- Potential exposure of persons to or generation of noise levels in excess of standards established by the FRA for high-speed ground transportation and by the FTA for rail projects.
- Potential exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels.
- A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project.
- A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.

2.2 Affected Environment (addition to Section 3.4.2 of 2008 Final Program EIR)

The affected environment presented in the 2008 Final Program EIR, Section 3.4.2 remains accurate. The reader is referred to that document for additional context. The following text is an addition to Section 3.4.2 of the 2008 Final Program EIR.

A. EXISTING NOISE ENVIRONMENT

All regional freeways considered in the study area are major contributors to the ambient noise environment. The HST Alignment Alternatives would primarily follow or parallel existing rail tracks. Along the proposed alignment alternative on the San Francisco Peninsula, along with freeway and

[3] FHWA classifies projects into three Types to determine the need for a noise analysis (23 CFR, Part 772.5).

roadway noise, the Caltrain passenger service is a major contributor to the ambient noise levels, especially at grade crossings, where horn noise dominates the noise environment within 0.25 mi of the intersections. In this corridor, freight traffic also occurs, but comprises a small percentage of the total rail traffic on the corridor when compared to the existing Caltrain passenger service, which runs over 90 trains per day through the corridor (Caltrain 2011).[4]

Also in southern San Jose and as far as Gilroy to the south, Caltrain, Amtrak, and freight rail are major contributors to the ambient noise levels. Along the proposed alignment alternative between San Jose and Gilroy, the alignment alternative would follow along Monterey Highway, which would contribute roadway noise. Within the project area, Monterey Highway is six lanes wide for approximately six miles from Hollywood Avenue to south of Blossom Hill Road, and four lanes wide south of Blossom Hill Road.

In the urban areas and suburban areas of the San Francisco Peninsula and San Jose, the ambient noise is estimated to range from L_{dn} 57 to 66 dBA. In many of the residential areas close to the international airports at San Francisco (SFO) and San Jose (SJC), the ambient levels exceed L_{dn} 65 dBA.

2.3 Environmental Consequences (addition to Section 3.4.3 of 2008 Final Program EIR)

The environmental consequences discussion presented in the 2008 Final Program EIR, Section 3.4.3 remains accurate. The reader is referred to that document for additional context. The following text is an addition to Section 3.4.3 of the 2008 Final Program EIR.

A. POTENTIAL MOVEMENT OF FREIGHT TRAIN TRACKS DUE TO HST ON THE SAN FRANCISCO PENINSULA

The HST alternative in the San Francisco to San Jose Corridor is intended to be a four-track, shared-use alignment that would integrate with existing Caltrain passenger service as well as UPRR freight service. The conceptual operating plan anticipates the local Caltrain and freight trains travel predominantly on the outside two tracks and the high-speed trains and express Caltrain trains to travel predominantly on the two inside tracks. However, depending on additional operational study related to integration of the HST with existing passenger and freight services, any of these train services could potentially run on the tracks placed on the outer portion of the newly expanded right-of-way. This would result in trains, including freight, running closer to existing homes, schools, and other noise-sensitive land uses. As described above, the screening analysis performed for this corridor is consistent with FTA methodology which takes into account the potential for freight and passenger trains to be closer to adjacent land. The two additional tracks in the corridor are accounted for because the screening distance is measured from the centerline of the rail corridor (i.e., alignment), and at 375 feet the potential impact area is sufficiently wide on either side of the centerline to capture the anticipated expansion of the right-of-way and potential for movement of freight trains to the outside tracks. The expansion of the right-of-way and potential movement of

[4] The rail corridor in the peninsula is owned by the Caltrain provider, the Peninsula Corridor Joint Powers Board (JPB), who manages train scheduling and determines on which track different trains operate. Freight service is allowed in the corridor when there is a window between passenger trains of at least 30 minutes headway. The Trackage Rights Agreement between the JPB and Southern Pacific Transportation Company (executed in November 1991) specifies that the JPB will make at least one of these windows available between 10:00 am and 3:00 pm each day in both northbound and southbound directions. Between midnight and 5 a.m., at least one main track of the Peninsula Main Line is available for freight with an adequate number of thirty (30) minute headway windows. Although this agreement does not explicitly limit the number of freight trains allowed per day in the corridor, in practice an average of about four freight trains travel in the corridor between Santa Clara Junction in San Francisco each 24 hour period. For the purposes of this evaluation, it is assumed that approximately four freight trains travel in the corridor, two trains during the daytime and two at night.

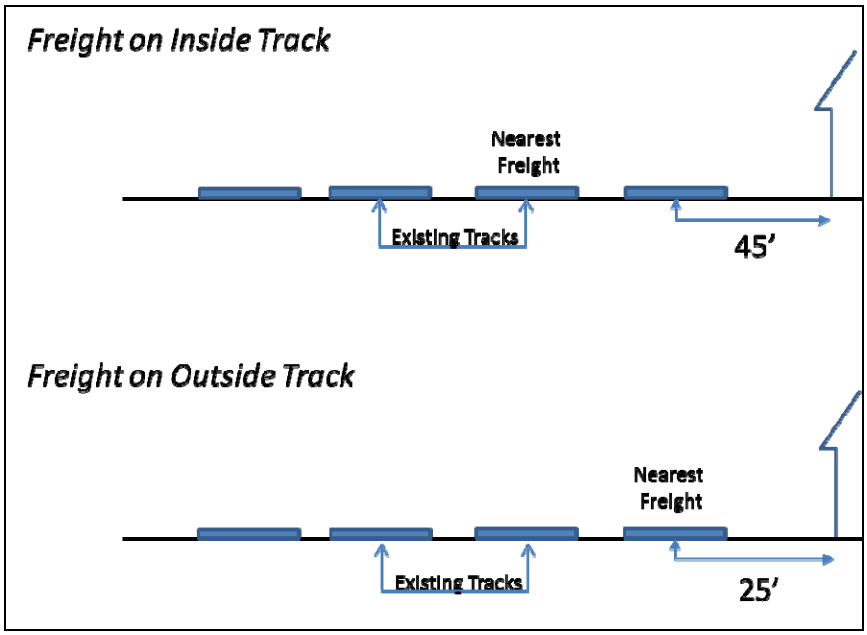
freight train tracks contributes to the overall medium ranking for noise in this corridor, as indicated in Table 3.4-4 of the 2008 Final Program EIR. The vibration analysis and rankings (medium for San Francisco to Dumbarton and high for Dumbarton to San Jose) also incorporate this in the screening methodology. Note that this impact rating takes into account the benefit of the elimination of grade crossings for existing passenger and freight rail in this corridor.

Based on the FTA methodology, the limited expansion of the existing Caltrain rail corridor has little to no effect on the number of properties captured in the screening analysis, or to the noise and vibration effects to properties just outside the right-of-way.

A representative, conservative scenario was developed to illustrate the consequences of moving freight trains closer to adjacent land uses. This scenario considered a four-track alignment where adjacent land uses were assumed to be just 25 feet from the closest track. Two scenarios were simulated (see Figure 2-1 below):

1. Freight trains operate on the inside tracks of a four-track alignment, approximately 45 feet from the adjacent sensitive land use (similar to where freight trains run under existing conditions).
2. Freight trains operate on the outside tracks, approximately 25 feet from the adjacent sensitive land use.

Figure 2-1
Freight Operations on Four-Track Alignment



The difference in noise level associated with freight trains being moved 20 feet closer to the sensitive land use was approximately 0.5 dBA in the 24 hour noise exposure level (Ldn) used to characterize noise impacts using FTA methodology. The vibration level would increase roughly 2.4 VdB, generally considered to be an imperceptible amount. This scenario conservatively assumed that all four freight trains in a 24 hour period would run on the track closest to the adjacent land use, and also assumed that all four freight trains would run at night (10 pm to 7 am).

This example underscores that the potential for freight trains to use outside tracks in a four-track, shared right of way does not change the conclusions in the 2008 Final Program EIR, Chapter 3.4 for the San Francisco to San Jose corridor. Noise impacts between San Francisco and San Jose are medium, vibration impacts are medium (San Francisco to Dumbarton) and high (Dumbarton to San Jose), and both are significant under CEQA at the program level.

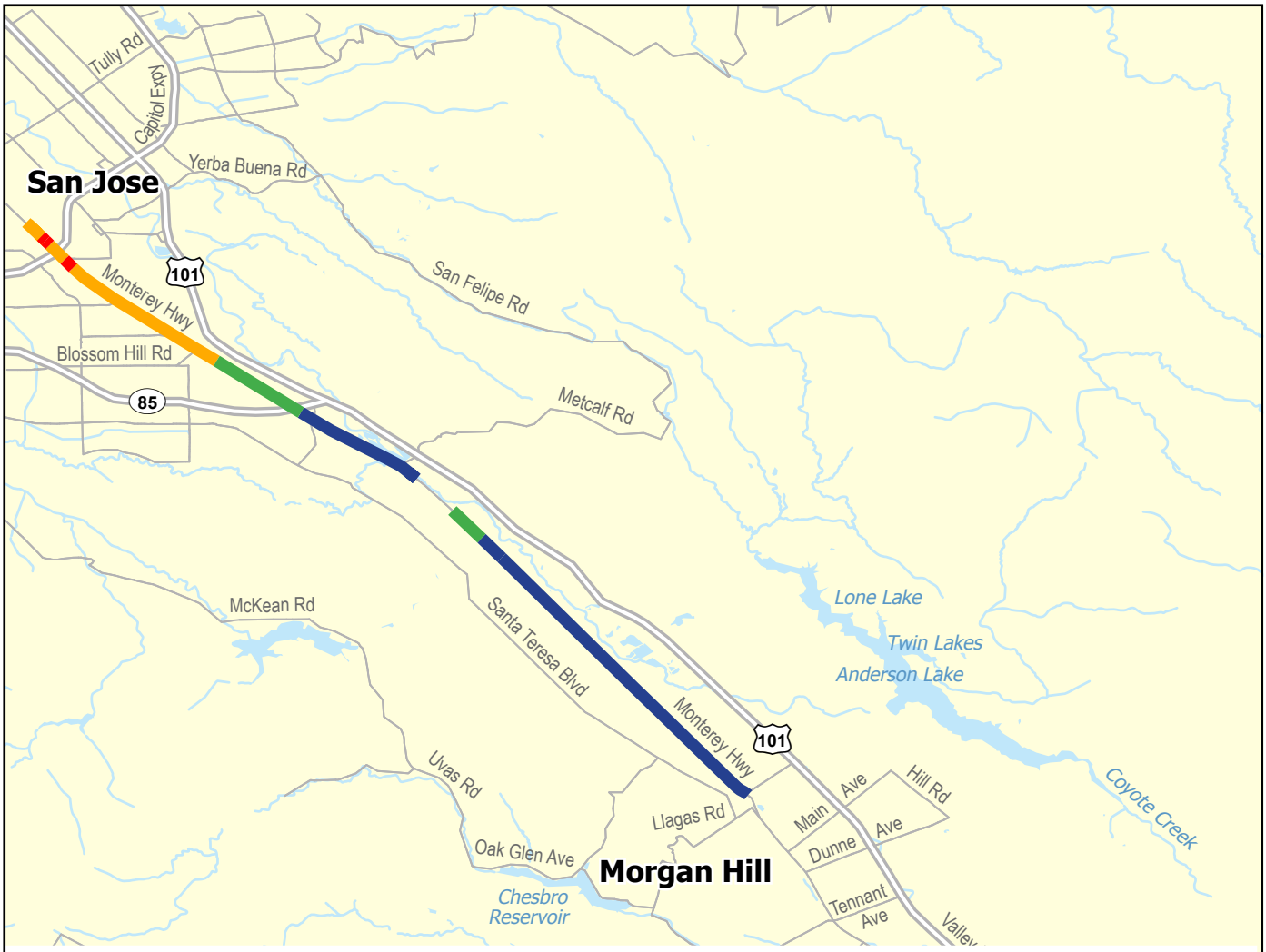
B. POTENTIAL LANE NARROWING AND SHIFTING OF MONTEREY HIGHWAY

To accommodate the HST, Monterey Highway is proposed to be narrowed from six lanes to four lanes and the lanes shifted east generally within the existing right-of-way from approximately Southside Drive to south of Blossom Hill Road (approximately 3.3 miles). The alignment is expected to be generally at grade; however, some areas may be raised or lowered for grade separations, depending on design details not available at the program level. At some locations north and south of Capitol Expressway, the narrowed four lanes and right-of-way of Monterey Highway may need to be shifted to the east up to 25 feet. In addition, the existing four lanes south of Blossom Hill Road would be shifted east within existing right-of-way and in some locations the right-of-way itself would also be shifted east up to 60 feet to accommodate the HST. This would occur in several locations less constrained by existing development. Figure 2-2 illustrates the approximate affected area along Monterey Highway that would require narrowing and/or the right-of-way shifted to the east.

The shift of Monterey Highway could have adverse or beneficial traffic noise impacts on nearby noise sensitive receptors, including residences. If the roadway is shifted east closer to sensitive receptors, traffic noise effects could be adverse; and if the highway is shifted farther away from sensitive receptors on the west, traffic noise effects could be beneficial. The lane reduction as part of the narrowing would have a beneficial traffic noise impact, depending on where the reduced lanes are shifted. Four locations were analyzed at the program level to evaluate potential traffic noise impacts as a result of Monterey Highway being narrowed and the lanes and right-of-way being shifted east. Table 2-2 provides the analysis for the four locations.

Under FHWA guidance, highways are assumed to result in a less than significant impact for vibration. The shift of Monterey Highway traffic lanes to the east would therefore have no additional or unique vibration impacts beyond those described for the San Jose to Central Valley corridor in the 2008 Final Program EIR, Chapter 3.4.

In summary, the anticipated noise impacts from lane narrowing on Monterey Highway and shifting the highway to the east vary, but overall involve significant impacts associated with the highway changes. It should be noted that traffic noise at residences located on the west side of Monterey Highway would be reduced in each of these areas due to any shift of traffic lanes to the east. However, that reduction may not be noticeable because the adjacent train noise would be the dominating noise source, as it is in the existing condition, at the residences located west of Monterey Highway. These impacts have been considered together with the FRA screening methodologies for assessing noise, and do not change the prior conclusion of medium noise impacts and medium vibration impacts for the Pacheco alignment within the San Jose to Central Valley Corridor. In addition, this information does not change the conclusion of the 2008 Final Program EIR that noise and vibration impacts in the San Jose to Central Valley Corridor would be significant under CEQA based on the FRA methodology. Out of an abundance of caution, the significant noise impacts associated with shifting Monterey Highway are also considered a separate significant noise impact under CEQA in this corridor.



LEGEND

Monterey Highway Narrowing (6 to 4 lanes)

- Lanes shifted within existing right-of-way
- Lanes and right-of-way shifted

Monterey Highway Shifting (Existing 4 lanes remain)

- Lanes shifted within existing right-of-way
- Lanes and right-of-way shifted
- Major Roads
- Other Roads
- Water

0 3

Miles

CALIFORNIA High-Speed Rail Authority

Figure 2-2
Proposed Monterey Highway Modifications
Bay Area to Central Valley HST Partially Revised Final Program EIR

Table 2-2
Noise Impacts Related to Monterey Highway Narrowing or Shifting

Monterey Highway Narrowing/ Shifting	Noise Impact	Receptors Considered / Included as part of 2008 FRA Noise Screening	Significant Impact
Monterey Highway Narrowing (6 to 4 lanes)			
Traffic lanes shifted east within existing right-of-way (Southside Drive to south of Blossom Hill Road)	Traffic noise levels reduced by 1 to 2 decibels (dB) as a result of the roadway realignment and lane reduction (less traffic).	Yes	No, beneficial
Traffic lanes and right-of-way shifted east up to 25 ft (Southside Drive to Fehren Drive and Capitol Expressway Ramp to Senter Road)	Right-of-way acquisition on east side and removal of existing property walls with traffic lanes closer to sensitive receptors to the east; increase in noise levels by greater than 5 dB without replacement in kind of property walls (similar noise levels with replacement of property walls)	Yes	Yes
Monterey Highway Shifting (Existing 4 lanes remain)			
Traffic lanes shifted east within existing right-of-way (Blossom Hill Road to Bernal Road and south of Coyote Ranch Road to Bailey Avenue)	Traffic noise levels increased by 1 to 2 dB as a result of the roadway realignment.	Yes	Yes
Traffic lanes shifted east up to 60 ft (Bernal Road to just south of Metcalf Road and Bailey Avenue to Cochrane Road)	Right-of-way acquisitions on east side and removal of existing property walls with traffic lanes closer to sensitive receptors to the east; increase in noise levels by greater than 2 to 3 dB with replacement in kind of property walls (any existing walls would be removed due to acquisitions)	Yes	Yes

C. POTENTIAL MOVEMENT OF FREIGHT TRAIN TRACKS DUE TO HST FROM SAN JOSE TO LICK

The HST alternative in the San Jose to Central Valley Corridor from approximately Tamien to Lick (a point near Pull Way in San Jose) is intended to use dedicated track within the Caltrain-owned right-of-way, adjacent to the existing Caltrain passenger service, as well as adjacent to UPRR freight service. To provide space for the addition of the HST tracks, the existing UPRR tracks would need to be relocated from their central position to a new position to the east side of the right-of-way up to 25 feet in some locations. The track on the east side would continue as the dedicated freight service track. Similar to the San Francisco Peninsula, the screening analysis performed for this segment is consistent with FTA methodology and takes into account the potential for freight and passenger trains to be closer to adjacent land uses for limited periods of time. The addition and movement of tracks in the corridor is accounted for and contributes to the overall medium impact rating for noise and vibration in the Pacheco corridor as indicated in Table 3.4-4 of the 2008 Final Program EIR. As noted above, potential shifts of this magnitude are accounted for in the methodology. Therefore,

these movements of tracks would not be anticipated to change the medium impact rating in the analysis provided in Table 3.4-4. In addition, this information would not change the conclusion of the 2008 Final Program EIR that noise and vibration impacts in the San Jose to Central Valley Corridor would be significant under CEQA.

2.4 Role of Design Practices in Avoiding and Minimizing Effects

The role of design practices in avoiding and minimizing effects presented in the 2008 Final Program EIR, Section 3.4.4 remains accurate and unchanged. The reader is referred to that document for additional context.

2.5 Mitigation Strategies and CEQA Significance Conclusions

The following text in Section 3.4.5 on page 3.4-22 of the 2008 Final Program EIR has been revised with the text below.

Based on the analysis above, and considering the design practices described in Section 3.4.4, each of the HST Alignment Alternatives would have significant noise and vibration impacts, as detailed in Table 3.4-4.

The HST Alignment Alternatives would create significant long-term noise and vibration impacts from introduction of a new transportation system. At the same time, the HST Alignment Alternatives would create some long-term noise reduction benefits because noise sources would be eliminated with grade separation of existing grade crossings. It is possible that at the future project-level of analysis, refined data and information would confirm that some sections of the alignment alternatives would result in less-than-significant noise and vibration impacts (i.e., through the Transbay Tunnel); however, for purposes of the programmatic analysis, the long-term noise and vibration impacts are considered significant for all sections. In addition, the HST Alignment Alternatives would involve significant short-term noise and vibration impacts from construction.

As discussed above, the corridor between San Jose and the Central Valley includes implementation of the HST along Monterey Highway, and results in shifting the highway. This particular condition results in additional significant noise and vibration impacts that are unique to this corridor. The San Francisco to San Jose Corridor includes the potential for freight trains to be closer to existing adjacent land uses than currently. This particular condition is also unique to this corridor, however, it is subsumed within the prior analysis of noise effects, which were already considered to have significant noise and vibration impacts.

General mitigation strategies are discussed in this program-level review of potential noise impacts associated with proposed alternatives that would reduce the impacts. General vibration mitigation strategies are less predictable at a program level of analysis because of the site-specific nature of vibration transmission through soil along the alignment. More detailed mitigation strategies for potential noise and vibration impacts would be developed in the next stage of environmental analysis. State-of-the-art ~~N~~noise and vibration mitigation measures can generally be applied to the source (train and associated structures), the path (area between train and receiver), and/or the receiver (property or building). An HST system would be designed and developed to meet state-of-the-art technology specifications for noise and vibration, based on the desire to provide the highest-quality train service possible. Trains and tracks would be maintained in accordance with all applicable standards to provide reliable operations.

Treatments, such as sound insulation or vibration controls to affected buildings, can be effective at reducing noise impacts. Although such treatments may be difficult to implement for the potentially numerous properties adjacent to the right-of-way, and would require protracted implementation procedures and separate design considerations, they have potential to be appropriate in some circumstances. The most feasible and effective mitigation treatments are typically those involving

blocking the line of sight. These mitigation measures can often be applied to the path within the right-of-way, either under or adjacent to the tracks. Potential noise impacts can be reduced substantially by the installation of sound barrier walls constructed to shield receivers from train noise. For vibration mitigation, several track treatments may be considered for reducing train vibrations. Determining the most appropriate treatment would depend on the site-specific ground conditions along the corridor. This program-level analysis has identified areas where future analysis should be given to potential HST-induced vibrations. The type of vibration mitigation and expected effectiveness will be determined as part of the second-tier project-level environmental analyses.

In accordance with Title 23 CFR 772, noise abatement is considered where traffic noise impacts are predicted in areas of frequent human use that would benefit from a lowered noise level. Potential noise abatement measures that are typically considered include the following: avoiding the impact by using horizontal and vertical design alternatives, constructing noise barriers, acquiring property to serve as a buffer zone, using traffic management measures to regulate types of vehicles and speeds, and acoustically insulating public-use or nonprofit institutional structures.

The following mitigation strategies for noise and vibration impacts associated with the shift of Monterey Highway and the potential to move freight train tracks closer to adjacent land uses are added to the end of Section 3.4.5:

A. NOISE BARRIERS FOR MONTEREY HIGHWAY

Noise barriers would be an effective strategy for mitigating Monterey Highway traffic noise as well as noise from the high-speed train. The location and height of potential barriers depends on the results of more detailed noise analysis and design. For Monterey Highway traffic noise impacts, the noise barrier may be located at the high-speed train right-of-way line, the roadway right-of-way line, or potentially at the private property line. Where existing property walls must be removed, such walls would be replaced at the appropriate locations to achieve noise reduction benefits.

B. BUILDING SOUND INSULATION

There may be circumstances where mitigation at the receiver is appropriate. As stated above, receiver mitigation such as building sound insulation or related treatments for individual properties may be difficult to implement. At the program level of analysis, this strategy is considered appropriate for continued consideration. It may be particularly relevant for consideration in areas along the shift of Monterey Highway and along the San Francisco Peninsula.

C. ACQUIRING PROPERTY TO SERVE AS A NOISE BUFFER ZONE

There may be limited circumstances where acquisition of property to service as a noise buffer may be appropriate. This strategy is considered appropriate for consideration as part of project-level environmental review.

D. TRAFFIC MANAGEMENT MEASURES FOR MONTEREY HIGHWAY

Develop traffic management measures, including vehicle speed limits and vehicle type limitations, for Monterey Highway. Work with the City of San Jose and Santa Clara County to establish appropriate traffic management measures to reduce Monterey Highway traffic noise.

In addition to the above mitigation strategies, the Authority will consider vertical profile variations as part of second-tier project planning and environmental review, in consultation with local agencies.

Sound barriers close to HST vehicles can reduce noise by 6 to 10 dB, sound barriers at the right-of-way line 5-8 dB, and building sound insulation 5 to 15 dB. The effectiveness of noise easements would depend on the particular facts of each case.

Consistent with the conclusions about noise and vibration in the 2008 Final Program EIR, the above mitigation strategies are expected to reduce to a less than significant level the noise impacts from shifting the Monterey Highway, as well as the noise impacts of the potential for freight trains on the Peninsula to be closer to nearby land uses. Vibration mitigation is less predictable at the program level of analysis, and therefore the vibration impacts are considered significant even with application of mitigation strategies. Additional environmental assessment would allow a more precise evaluation in the second-tier, project-level environmental documents.

2.6 Subsequent Analysis

The discussion of subsequent analysis presented in the 2008 Final Program EIR, Section 3.4.6 remains accurate and unchanged. The reader is referred to that document for additional context.