

4.10 NOISE

This chapter evaluates the potential impacts on the noise environment that could occur as a result of Scenarios 5 and 6. The technical data and modeling used to for the analysis in this chapter are located in Appendix I, Supplemental Noise Appendix, of this Supplemental Draft EIR. Data and modeling for Scenarios 1 thorough 4 are contained in Appendix F, Technical Noise Data and Modeling, of the February 2016 Draft Environmental Impact Report (EIR).

This analysis is based on the Regulatory Framework and Existing Conditions information provided in the February 2016 Draft EIR.

4.10.1 ENVIRONMENTAL SETTING

No revisions are required to the Regulatory Framework and Existing Conditions information presented in the February 2016 Draft.

4.10.2 STANDARDS OF SIGNIFICANCE

Appendix G of the California Environmental Quality Act (CEQA) Guidelines, and the Palo Alto Municipal Code contains standards of significance for the evaluation of a project's impacts. The proposed Plan would result in a significant noise impact if it would:

- Cause the average 24-hour noise level (L_{dn}) to increase by 5-10 decibels (dB) or more in an existing residential area, even if the L_{dn} would remain below 60 dB.
- Cause the L_{dn} to increase by three dB or more in an existing residential area, thereby causing the L_{dn} in the area to exceed 60 dB.
- Cause an increase of three dB or more in an existing residential area where the L_{dn} currently exceeds 60 dB.
- Result in indoor noise levels for residential development to exceed an L_{dn} of 45 dB.
- Expose persons to or generate excessive groundbome vibrations or groundbome noise levels.
- Expose people to noise levels in excess of established State standards.
- Exposure of people to or generation of noise levels in excess of standards established in the General Plan or the Municipal Code, or applicable standards of other agencies.
- A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.

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

4.10.3 IMPACT DISCUSSION

The remaining sections of this chapter provide an analysis of the potential project impacts, including impacts from growth expected to occur during the life of the proposed Plan, as well as cumulative noise impacts that could occur as a result of the implementation of the proposed Plan when combined with projects outside of Palo Alto.

The conclusions below are based on the same analytical approach used in the impact discussions in the February 2016 Draft EIR. The characteristics of Scenarios 5 and 6 are described in detail in Section 3.4 of Chapter 3, Project Description, of this Supplement to the Draft EIR.

NOISE-1	Implementation of the proposed Plan would have the potential to cause the average 24-hour noise level (L_{dn}) to increase by 5.0 decibels (dB) or more in an existing residential area, even if the L_{dn} would remain below 60 dB. (Potentially Significant and Mitigable – Scenarios 5 and 6)
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February 2016 Draft EIR Findings: The February 2016 Draft EIR discussed several aspects of operational noise, including long-term operational noise, roadway noise, airport/heliport noise, and railway noise. For long-term operational noise, Scenario 1 would result in a less-than-significant impact while Scenarios 2, 3, and 4 would result in a potentially significant impact, requiring mitigation. Mitigation Measure NOISE-1a would reduce this impact to a less-than-significant level.

Regarding transportation-related noise, the impact would be less than significant for Scenarios 1 through 4 with respect to roadway noise. For transportation noise related to aircraft and railway noise, the impact would be potentially significant for Scenarios 1 through 4. Mitigation Measures NOISE-1b and NOISE-1c, dealing with aircraft noise and railway noise, respectively, would reduce this impact to a less-than-significant level.

Summary of Supplemental Analysis: The impact related to long-term, non-transportation, operational noise would be potentially significant under Scenarios 5 and 6, requiring mitigation. Mitigation Measure NOISE-1a would reduce this impact to a less-than-significant level.

The transportation noise impact related to roadway noise would be less than significant under Scenarios 5 and 6. The transportation noise impact related to aircraft and railway noise sources would be potentially

significant impacts under Scenarios 5 and 6, requiring mitigation. Mitigation Measures NOISE-1b and NOISE-1c, dealing with aircraft noise and railway noise, respectively, would reduce this impact to a less-than-significant level.

Mitigation Measure NOISE-1 has been revised, as shown below. These revisions will also be applied to the mitigation for Scenarios 2 through 4. The revisions do not change the original intent or effectiveness of Mitigation Measure NOISE-1.

Mitigation Measure NOISE-1a: ~~The following policies and programs, or equally effective language, shall be included in the proposed Plan:~~ To ensure that average 24-hour noise levels associated with long-term operational noise would not increase by 5.0 decibels (dB) or more in an existing residential area, the proposed Plan shall include policies that address the following topics: ~~under Scenarios 2 through 6 would not result in significant increases in average 24-hour noise levels.~~

- Location of land uses in areas with compatible noise environments.
- Use of the guidelines in the “Land Use Compatibility for Community Noise Environment” table to evaluate the compatibility of proposed land uses with existing noise environments.
- Clear guidelines for maximum outdoor noise levels in residential areas.
- Adherence to the interior noise requirements of the State of California Building Standards Code (Title 24) and the Noise Insulation Standards (Title 25).
- Inclusion of a noise contour map in the proposed Plan.
- Reduction of noise impacts of development on adjacent properties.
- Updating for clarity the Noise Ordinance to make enforcement easier.
- ~~Policy: Encourage the location of land uses in areas with compatible noise environments. Use the guidelines in the table “Land Use Compatibility for Community Noise Environment” to determine compatibility.~~

- For exterior noise, the guideline for “normally acceptable” noise levels in residential areas is an L_{dn} of 60 dBA. This level is a guideline for the design and location of future development and a goal for the reduction of noise in existing development. However, 60 dBA L_{dn} is a guideline which cannot necessarily be reached in all residential areas within the constraints of economic or aesthetic feasibility. This guideline will be primarily applied where outdoor use is a major consideration (e.g., backyards in single-family housing developments and recreational areas in multiple-family housing projects). Where the City determines that providing an L_{dn} of 60 dBA or lower outdoors is not feasible, the noise level in outdoor areas intended for recreational use should be reduced to as close to the standard as feasible through project design.
- For interior noise, the requirements of the State of California Building Standards Code (Title 24) and the Noise Insulation Standards (Title 25) are extended to all new dwelling units in Palo

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~~Alto. Specifically, interior levels for all habitable rooms must not exceed an Ldn of 45 dBA in all new dwelling units in Palo Alto.~~

- ~~– Noise exposure(s) should be determined from a) more detailed noise exposure studies, or b) area-specific or project-specific noise measurements, as appropriate. Noise contour maps in this plan can be used as a preliminary screening tool in determining approximate noise exposure.~~
- ~~– Prior to the initial development application for future developments near noise-sensitive land uses, the applicant shall submit an acoustical analysis by an acoustical engineer demonstrating projected compliance with the Comprehensive Plan, the Noise Ordinance, and the State building code. The analysis shall be based on acoustical readings, equipment specifications, architectural designs (even if preliminary), and any proposed sound reduction/insulation measures, such that the pertinent land use compatibility, interior environments, and project-related noise emissions can be demonstrated to comply with prescribed city, county, and state noise standards.~~

~~■ Policy: The City may require proposals to reduce noise impacts of development on adjacent properties through appropriate means including, but not limited to, the following:~~

- ~~– Construct noise walls when compatible with aesthetic concerns.~~
- ~~– Screen and control noise sources such as parking, outdoor activities, and mechanical equipment.~~
- ~~– Increase setbacks for noise sources from adjacent dwellings.~~
- ~~– Whenever possible, retain fences, walls, or landscaping that serve as noise buffers although design, safety, and other impacts must be addressed.~~
- ~~– Use soundproofing materials and double-glazed windows.~~
- ~~– Control hours of operation, including deliveries and trash pickup, to minimize noise impacts.~~

~~■ Program: Update the Noise Ordinance to provide for clear interpretation of the regulations, and to review the appropriateness of existing standards. Strictly enforce the Noise Ordinance.~~

Mitigation Measure NOISE-1b: ~~The following policy, or equally effective language, shall be included in the proposed Plan. To ensure that aircraft noise under all four scenarios would not increase average 24-hour noise levels by 5.0 decibels (dB) or more in an existing residential area, the proposed Plan shall include policies that address the following topics: result in significant increases in average 24-hour noise levels.~~

The following new policy shall be adopted as part of the proposed Plan. The wording of this policy may change as long as the revised policy is equally effective in mitigating potential aircraft noise impacts:

- Compliance with the airport-related land use compatibility standards for community noise environments.

- Prohibition of incompatible land use development within the 60 dBA CNEL noise contours of the Palo Alto airport, as established in the adopted County of Santa Clara Airport Land Use Commission Comprehensive Land Use Plan (CLUP) for the Palo Alto Airport.
- ~~Policy: Ensure compliance with the airport related land use compatibility standards for community noise environments by prohibiting incompatible land use development within the 60 dBA CNEL noise contours of the Palo Alto airport.~~

Mitigation Measure NOISE-1c: ~~The following policies, or equally effective language, shall be included in the proposed Plan. To ensure that railway noise under all four scenarios would not increase average 24-hour noise levels by 5.0 decibels (dB) or more in an existing residential area, the proposed Plan shall include policies that address the following topics: result in significant increases in average 24-hour noise levels:~~

- Noise spillover from rail-related activities into adjacent noise-sensitive areas.
- Reduction of impacts from noise and ground borne vibrations associated with rail operations.
- Guidelines for interior noise levels.
- Requirements for vibration impact analysis for future development projects.
- ~~Policy: Minimize noise spillover from rail related activities into adjacent residential or noise-sensitive areas.~~
- ~~Policy: Reduce impacts from noise and ground borne vibrations associated with rail operations by requiring that future development of habitable buildings address the following:~~
 - ~~Be sited at least 100 feet from the centerline of the tracks whenever feasible.~~
 - ~~Interior noise level of up to 45 dBA Ldn, with windows closed must be ensured through structural design. For habitable buildings located within 100 feet from the centerline of railroad tracks, developments shall provide a detailed noise impact analysis, prepared by a qualified acoustical consultant technician, demonstrating that noise and ground borne vibration issues associated with rail operations have been adequately addressed (i.e., by building siting or construction techniques). This study must demonstrate that an interior noise level of 45 dBA Ldn will not be exceeded with windows closed.~~
 - ~~Provide a detailed vibration impact analysis, prepared by a qualified acoustical consultant, demonstrating that ground borne vibration levels will not exceed 72 VdB (relative to one microinch/sec) at residential buildings or 65 VdB at buildings with vibration sensitive uses.~~

Long-Term Operational Noise

As discussed in the February 2016 Draft EIR, substantial permanent increases in ambient noise levels would be most likely to result from development of commercial, industrial, mixed-use, and certain institutional or

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active recreational land uses (i.e., ball fields, skate-parks, dog parks). Since Scenarios 5 and 6 could result in zoning changes for commercial and residential land uses, the impact would be *potentially significant*, and mitigation would be required.

Transportation-Related Noise

Roadway Noise

As a result of implementation of the proposed Plan and ongoing regional growth, it is anticipated that there would be substantial permanent increases to the ambient noise levels throughout Palo Alto, and that these increases would primarily result from increases to transportation-related noise, especially that of automobile traffic. However, these increases are not expected to meet or exceed the City's thresholds and, thus, would not result in a significant impact.

Additionally, with the high degree of similar results for roadway-related noise, all six scenarios would have indistinguishable graphical representations for the future conditions noise contour map. As such, the CNEL contour map shown in Figure 4.10-4 of the February 2016 Draft EIR would also apply to Scenarios 5 and 6.

To summarize all the traffic-related noise environments, Table 4.10-11 from the February 2016 Draft EIR has been expanded to compare the CNEL increases for Scenarios 1 through 6. As shown in expanded Table 4.10-11, the roadway segments with the largest projected increases (across all scenarios) are Arastradero Road (between the I-280 and El Camino Real), Embarcadero Road (between El Camino Real and US 101), and Foothill Expressway/Junipero Serra Boulevard (between Sand Hill Road and Arastradero Road). Additionally, all of the projected increases are at or below 1.5 dB and, thus, neither Scenario 5 nor 6 would result in significant increases (i.e., plus 5 dB) in ambient noise levels for any of the roadway segments.

Tables 4.10-A and 4.10-B show major roadway segments in Palo Alto with estimated increases in the ambient noise level (at a distance of 50 feet) from the roadway centerline for Scenarios 5 and 6, respectively.

As shown in Tables 4.10-A and 4.10-B, none of the segments would experience a significant increase (i.e., plus 5 dB) in traffic noise levels under either Scenario 5 or 6. Thus, no segments would have future traffic noise impacts that would be a significant impact. Therefore, Scenarios 5 and 6 would result in a *less-than-significant* impact associated with roadway noise.

Airport/Heliport Noise

As discussed in the February 2016 Draft EIR, notable increases in ambient noise levels from air traffic are not anticipated as a result of any of the Comp Plan scenarios, which would be true under Scenarios 5 and 6 as well. However, encroachment of land uses near these aircraft facilities, along with unknown future operations patterns, could potentially result in unacceptable aircraft-related noise environments from one or both of these Palo Alto-based facilities. Thus, future aircraft-related conditions would result in a *potentially significant* impact under all six scenarios, requiring mitigation.

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TABLE 4.10-11 INCREASES TO AMBIENT NOISE LEVELS ALONG MAJOR ROADWAY SEGMENTS – COMPARISON

Roadway	Segment	Increase in Ambient Noise Level at 50 Feet from Roadway Centerline CNEL dBA					
		Scenario 1	Scenario 2	Scenario 3	Scenario 4	<u>Scenario 5</u>	<u>Scenario 6</u>
Sand Hill Road	I-280 to El Camino Real	1.1	1.2	1.2	1.1	<u>1.1</u>	<u>1.1</u>
El Camino Real	Sand Hill Road to Page Mill Road	0.8	0.8	0.8	0.9	<u>0.8</u>	<u>0.6</u>
	Page Mill Road to San Antonio Road	1.0	0.9	0.9	1.0	<u>0.8</u>	<u>0.4</u>
Page Mill Road	I-280 to El Camino Real	0.5	0.4	0.5	0.6	<u>0.5</u>	<u>0.7</u>
Arastradero Road	I-280 to El Camino Real	1.5	1.4	1.5	1.4	<u>1.2</u>	<u>1.1</u>
Alma Street	University Avenue to San Antonio Road	0.8	0.8	0.8	0.8	<u>0.7</u>	<u>0.8</u>
Middlefield Road	University Avenue to San Antonio Road	0.3	0.0	0.0	0.1	<u>0.0</u>	<u>0.1</u>
University Avenue	El Camino Real to US 101	0.2	0.2	0.2	0.3	<u>0.3</u>	<u>0.3</u>
Embarcadero Road	El Camino Real to US 101	1.2	1.1	1.2	1.3	<u>1.2</u>	<u>1.2</u>
Oregon Expressway	El Camino Real to US 101	0.2	0.0	0.1	0.2	<u>0.0</u>	<u>0.0</u>
Charleston Road	El Camino Real to San Antonio Road	1.2	1.0	1.1	1.2	<u>0.9</u>	<u>1.3</u>
San Antonio Road	El Camino Real to US 101	0.2	0.2	0.2	0.1	<u>0.1</u>	<u>0.1</u>
Foothill Expressway/Junipero Serra Blvd	Sand Hill Road to Arastradero Road	1.4	1.3	1.4	1.4	<u>1.4</u>	<u>1.3</u>

Note: This table is a reproduction and expansion of Table 4.10-11 in the February 2016 Draft EIR. Revisions to Table 4.10-11 are shown in ~~strike through~~ and underline.

Source: Hexagon Transportation Consultants, Inc., 2016; PlaceWorks, 2016.

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TABLE 4.10-A INCREASES TO AMBIENT NOISE LEVELS ALONG MAJOR ROADWAY SEGMENTS AND POST-MITIGATION CONDITIONS – SCENARIOS 5

Roadway	Segment	Ambient Noise Level at 50 Feet from Roadway Centerline CNEL dBA				
		Existing Conditions	Scenario 5 Conditions	Increase (dBA)	Post-Mitigation Scenario 5	Increase (dBA)
Sand Hill Road	I-280 to El Camino Real	70.8	71.9	1.1	71.9	1.1
El Camino Real	Sand Hill Rd to Page Mill Rd	74.9	75.7	0.8	75.6	0.7
	Page Mill Rd to San Antonio Rd	74.2	75.0	0.8	75.0	0.8
Page Mill Rd	I-280 to El Camino Real	71.6	72.1	0.5	72.0	0.4
Arastradero Rd	I-280 to El Camino Real	64.3	65.5	1.2	65.5	1.2
Alma Street	University Ave to San Antonio Rd	70.4	71.1	0.7	71.1	0.7
Middlefield Rd	University Ave to San Antonio Rd	63.1	63.1	0.0	63.1	0.0
University Ave	El Camino Real to US 101	64.9	65.2	0.3	65.1	0.2
Embarcadero Rd	El Camino Real to US 101	66.4	67.6	1.2	67.3	0.9
Oregon Expressway	El Camino Real to US 101	71.1	71.1	0.0	71.1	0.0
Charleston Rd	El Camino Real to San Antonio Rd	63.2	64.1	0.9	64.1	0.9
San Antonio Rd	El Camino Real to US 101	71.8	71.9	0.1	71.9	0.1
Foothill Expressway/ Junipero Serra Blvd	Sand Hill Rd to Arastradero Rd	70.0	71.4	1.4	71.3	1.3

Source: Hexagon Transportation Consultants, Inc., 2016; PlaceWorks, 2016.

Railway Noise

As discussed in the February 2016 Draft EIR, future increases in the number and frequency of railway operations, as a result of the Caltrain Modernization Program, would result in higher noise level contributions near the rail lines, but these increases would be offset, to some unknown extent, by the use of electrified and updated equipment that would have quieter overall noise emissions than the current fleet of trains.¹ Since a definitive assessment of either the operations increases or the improvement decreases cannot be made at this time, future railway operations could potentially result in unacceptable rail-related noise environments. This would have a *potentially significant* impact, requiring mitigation under Scenarios 5 and 6.

¹ Additional information on the Caltrain Modernization Program – presented here for reference purposes since Caltrain operations are not under the purview of this Comprehensive Plan Update – may be found at: http://www.caltrain.com/Assets/Peninsula+Rail+Program/Electrification+2025/Caltrain_Electrification_EA-FEIR_Vol-I_July_2009-WEB.pdf; accessed 6/18/15 and 10/30/15.

TABLE 4.10-B INCREASES TO AMBIENT NOISE LEVELS ALONG MAJOR ROADWAY SEGMENTS AND POST-MITIGATION CONDITIONS – SCENARIO 6

Roadway	Segment	Ambient Noise Level at 50 Feet from Roadway Centerline CNEL dBA				
		Existing Conditions	Scenario 6 Conditions	Increase (dBA)	Post-Mitigation Scenario 6	Increase (dBA)
Sand Hill Road	I-280 to El Camino Real	70.8	71.9	1.1	71.9	1.1
El Camino Real	Sand Hill Rd to Page Mill Rd	74.9	75.5	0.6	75.5	0.6
	Page Mill Rd to San Antonio Rd	74.2	74.6	0.4	74.5	0.3
Page Mill Rd	I-280 to El Camino Real	71.6	72.3	0.7	72.2	0.6
Arastradero Rd	I-280 to El Camino Real	64.3	65.4	1.1	65.4	1.1
Alma Street	University Ave to San Antonio Rd	70.4	71.2	0.8	71.2	0.8
Middlefield Rd	University Ave to San Antonio Rd	63.1	63.2	0.1	63.1	0.0
University Ave	El Camino Real to US 101	64.9	65.2	0.3	65.0	0.1
Embarcadero Rd	El Camino Real to US 101	66.4	67.6	1.2	67.5	1.1
Oregon Expressway	El Camino Real to US 101	71.1	71.1	0.0	71.1	0.0
Charleston Rd	El Camino Real to San Antonio Rd	63.2	64.5	1.3	64.5	1.3
San Antonio Rd	El Camino Real to US 101	71.8	71.9	0.1	71.9	0.1
Foothill Expressway/ Junipero Serra Blvd	Sand Hill Rd to Arastradero Rd	70.0	71.3	1.3	71.3	1.3

Source: Hexagon Transportation Consultants, Inc., 2016; PlaceWorks, 2016.

Applicable Regulations:

- California Code of Regulations, Title 24, Building Standards
- Palo Alto Municipal Code: Chapter 9.10, Noise

Significance before Mitigation: For roadway-related noise, there would be no significant roadway flow increases to result in impacts. Thus, roadway noise requires no mitigation. For long-term operational noise, Scenarios 5 and 6 would result in a potentially significant impact, requiring mitigation. For transportation noise related to aircraft and railway noise, Scenarios 5 and 6 would result in potentially significant impacts and would require mitigation measures.

Mitigation Measures

Mitigation Measures NOISE-1a through NOISE-c would apply to Scenarios 5 and 6.

Significance after Mitigation: Less than Significant.

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Analysis conducted to understand the effect of implementing mitigation measures shows that with implementation of the policies called for in Mitigation Measures NOISE-1a through NOISE-1c, long-term operational noise, aircraft-related noise, and railway-related noise would be controlled and/or mitigated so as to comply with City standards for noise emissions. There are no predicted significant impacts due to roadway-related noise for any scenario and this would remain the case regardless of whether the proposed policies were implemented or not. However, post-mitigation conditions for Scenarios 5 and 6 would include traffic mitigation measures that would reduce vehicular traffic and thereby reduce roadway noise.

Tables 4.10-A, 4.10-B, and 4.10-C show major roadway segments in Palo Alto with estimated increases in the ambient noise level (at a distance of 50 feet) from the roadway centerline for Scenarios 5 and 6 with post-mitigation conditions. Mitigation would decrease roadway noise levels by between 0.0 and 0.3 dB. As shown in Tables 4.10-A, 4.10-B, and 4.10-C, none of the segments would experience a significant increase (i.e., plus 5 dB) in traffic noise levels under mitigated conditions. Thus, no segments would have future traffic noise impacts that would be a significant impact.

NOISE-2	Implementation of the proposed Plan would not cause the L_{dn} to increase by three dB or more in an existing residential area, thereby causing the L_{dn} in the area to exceed 60 dB. (Potentially Significant and Mitigable – Scenarios 5 and 6)
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February 2016 Draft EIR Findings: Scenario 1 would result in a less-than-significant impact associated with long-term operational noise, while Scenarios 2 through 4 would result in a potentially significant impact, requiring mitigation. Roadway noise impacts would be less than significant under Scenarios 1 through 4. Rail-related and aircraft-related operations would result in potentially significant impacts under Scenarios 1 through 4, requiring mitigation. Mitigation Measure NOISE-2 would apply to all four scenarios and would reduce the impact to a less-than-significant level.

Summary of Supplemental Analysis: Long-term, non-transportation, operational noise for Scenarios 5 and 6 would result in potentially significant impacts that would be mitigated to less-than-significant levels via Mitigation Measure NOISE-1a. Transportation noise related to aircraft and railway noise sources would result in potentially significant impacts for Scenarios 5 and 6 and Mitigation Measures NOISE-1b and NOISE-1c would apply for these two scenarios. Roadway noise would result in less-than-significant impacts for Scenarios 5 and 6.

Mitigation Measure NOISE-2: Implement Mitigation Measures NOISE-1a, NOISE-1b, and NOISE-1c.

As discussed in the February 2016 Draft EIR, this impact threshold is closely related to that of Impact NOISE-1 (above).

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TABLE 4.10-C INCREASES TO AMBIENT NOISE LEVELS ALONG MAJOR ROADWAY SEGMENTS – COMPARISON OF SCENARIO 5 AND 6 POST-MITIGATION CONDITIONS

Roadway	Segment	Increase in Ambient Noise Level at 50 Feet from Roadway Centerline CNEL dBA	
		Post-Mitigation Scenario 5	Post-Mitigation Scenario 6
Sand Hill Road	I-280 to El Camino Real	1.1	1.1
El Camino Real	Sand Hill Road to Page Mill Road	0.7	0.6
	Page Mill Road to San Antonio Road	0.8	0.3
Page Mill Road	I-280 to El Camino Real	0.4	0.6
Arastradero Road	I-280 to El Camino Real	1.2	1.1
Alma Street	University Avenue to San Antonio Road	0.7	0.8
Middlefield Road	University Avenue to San Antonio Road	0.0	0.0
University Avenue	El Camino Real to US 101	0.2	0.1
Embarcadero Road	El Camino Real to US 101	0.9	1.1
Oregon Expressway	El Camino Real to US 101	0.0	0.0
Charleston Road	El Camino Real to San Antonio Road	0.9	1.3
San Antonio Road	El Camino Real to US 101	0.1	0.1
Foothill Expressway/Junipero Serra Boulevard	Sand Hill Road to Arastradero Road	1.3	1.3

Source: Hexagon Transportation Consultants, Inc., 2016; PlaceWorks, 2016.

Long-Term Operational Noise

As discussed in Impact NOISE-1, Scenarios 5 and 6 could result in zoning changes for commercial and residential land uses. As in the February 2016 Draft EIR, changes could result in noise level increases such that L_{dn} would increase by 3 dB, causing the L_{dn} in an area to exceed 60 dBA L_{dn} . The impact would be *potentially significant*, and mitigation would be required.

Transportation-Related Noise

Roadway Noise

As a result of implementation of the proposed Plan and ongoing regional growth, it is anticipated that there would be substantial permanent increases to the ambient noise levels throughout Palo Alto, and that these increases would primarily result from increases to transportation-related noise, especially that of automobile traffic. However, these increases are not expected to meet or exceed the City’s thresholds and, thus, would

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not result in a significant impact. Please see the results presented above under Impact NOISE-1; most notably, Tables 4.10-A and 4.10-B. As shown in these tables, all of the projected increases are at or below 1.5 dB. Specifically, no segments under Scenarios 5 and 6 would result in significant increases (i.e., plus 3 dB) in ambient noise levels for any of the roadway segments. Therefore, Scenarios 5 and 6 would result in a *less-than-significant* impact.

Aircraft/Heliport Noise

As discussed in the February 2016 Draft EIR, because of the unknown nature of future operations patterns, unacceptable aircraft-related noise environments could potentially exist. That is, aircraft operations may cause the L_{dn} to increase by 3 dB or more in an existing residential area and which would cause the L_{dn} in the area to be pushed above 60 dBA L_{dn} . Thus, future aircraft-related conditions could result in a *potentially significant* impact, requiring mitigation.

Railway Noise

As discussed in the February 2016 Draft EIR and Impact NOISE-1, no definitive assessment of either the operations increases or the improvement decreases can be made at this time. Future railway operations may cause the L_{dn} to increase by 3 dB or more in an existing residential area and which would cause the L_{dn} in the area to be pushed above 60 dBA L_{dn} . Thus, future rail-related conditions would result in a *potentially significant* impact, requiring mitigation.

Applicable Regulations:

- California Code of Regulations, Title 24, Building Standards
- Palo Alto Municipal Code: Chapter 9.10, Noise

Significance before Mitigation: For roadway-related noise, there would be no significant roadway flow increases to result in impacts. Thus, roadway noise requires no mitigation. For long-term operational noise, Scenarios 5 and 6 would result in a potentially significant impact, requiring mitigation. For transportation noise related to aircraft and railway noise, Scenarios 5 and 6 would result in potentially significant impacts and would require mitigation measures.

Mitigation Measures

Mitigation Measure NOISE-2 would apply to Scenarios 5 and 6.

Significance after Mitigation: Less than Significant. The additional policies of the proposed Plan – including implementation of Mitigation Measures NOISE-1a, -1b, and -1c – would control city-wide noise levels so as to comply with City standards.

Analysis conducted to understand the effect of implementing mitigation measures shows that, as shown above in Tables 4.10-A and 4.10-B (under Impact NOISE-1), under post-mitigation conditions none of the

segments would experience a significant increase (i.e., plus 5 dB) in traffic noise levels under either Scenario 5 or 6.

NOISE-3 Implementation of the proposed Plan would have the potential to cause an increase of three dB or more in an existing residential area where the L_{dn} currently exceeds 60 dB. (Potentially Significant and Mitigable – Scenarios 5 and 6)

February 2016 Draft EIR Findings: Scenario 1 would result in a less-than-significant impact associated with long-term operational noise, while Scenarios 2 through 4 would result in a potentially significant impact, requiring mitigation. Roadway noise impacts would be less than significant under Scenarios 1 through 4. Rail-related and aircraft-related operations would result in potentially significant impacts under Scenarios 1 through 4, requiring mitigation. Mitigation Measure NOISE-3 would apply to all four scenarios and would reduce the impact to a less-than-significant level.

Summary of Supplemental Analysis: Long-term, non-transportation, operational noise for Scenarios 5 and 6 would result in potentially significant impacts that would be mitigated to less-than-significant levels via Mitigation Measure NOISE-1a. Transportation noise related to aircraft and railway noise sources would result in potentially significant impacts for Scenarios 5 and 6 and Mitigation Measures NOISE-1b and NOISE-1c would apply for these two scenarios. Roadway noise would result in less-than-significant impacts for Scenarios 5 and 6.

Mitigation Measure NOISE-3: Implement Mitigation Measures NOISE-1a, NOISE-1b, and NOISE-1c.

As discussed in the February 2016 Draft EIR, this impact threshold is closely related to that of NOISE-1 (above).

Long-Term Operational Noise

As discussed in Impact NOISE-1, Scenarios 5 and 6 could result in zoning changes for commercial and residential land uses. As in the February 2016 Draft EIR, changes could result in noise level increases such that L_{dn} would increase by 3 dB, in a residential area that already exceeds 60 dB L_{dn} . The impact would be *potentially significant*, and mitigation would be required.

Transportation-Related Noise

Roadway Noise

As a result of implementation of the proposed Plan and ongoing regional growth, it is anticipated that there would be substantial permanent increases to the ambient noise levels throughout Palo Alto, and that these

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increases would primarily result from increases to transportation-related noise, especially that of automobile traffic. However, these increases are not expected to meet or exceed the City's thresholds and, thus, would not result in a significant impact under Scenarios 5 and 6.

Please see the results presented above under Impact NOISE-1; most notably, Tables 4.10-A and 4.10-B. As shown in these tables, all of the projected increases are at or below 1.5 dB for Scenarios 5 and 6. Specifically, no segments under Scenarios 5 and 6 would result in significant increases (i.e., plus 3 dB) in ambient noise levels for any of the roadway segments. Therefore, Scenarios 5 and 6 would result in a *less-than-significant* impact.

Aircraft/Heliport Noise

As discussed in the February 2016 Draft EIR, because of the unknown nature of future operations patterns, unacceptable aircraft-related noise environments could potentially exist. That is, aircraft operations may cause the L_{dn} to increase by 3 dB or more in an existing residential area, which is already exceeding 60 dBA L_{dn} . Thus, future aircraft-related conditions could result in a *potentially significant* impact, requiring mitigation.

Railway Noise

As discussed in the February 2016 Draft EIR and Impact NOISE-1, no definitive assessment of either the operations increases or the improvement decreases can be made at this time. Future railway operations may cause the L_{dn} to increase by 3 dB or more in an existing residential area which is already exceeding 60 dBA L_{dn} . Thus, future rail-related conditions could result in a *potentially significant* impact, requiring mitigation.

Applicable Regulations:

- California Code of Regulations, Title 24, Building Standards
- Palo Alto Municipal Code: Chapter 9.10, Noise

Significance before Mitigation: For roadway-related noise, there would be no significant roadway flow increases to result in impacts. Thus, roadway noise requires no mitigation. For long-term operational noise, Scenarios 5 and 6 would result in a potentially significant impact, requiring mitigation. For transportation noise related to aircraft and railway noise, Scenarios 5 and 6 would result in potentially significant impacts and would require mitigation measures.

Mitigation Measures

Mitigation Measure NOISE-3 would apply to Scenarios 5 and 6.

Significance after Mitigation: Less than Significant. The additional policies of the proposed Plan – including implementation of Mitigation Measures NOISE-1a, -1b, and -1c – would control citywide noise levels so as to comply with City standards.

Analysis conducted to understand the effect of implementing mitigation measures shows that under post-mitigation conditions, as shown in Tables 4.10-A and 4.10-B (under Impact NOISE-1), none of the segments would experience a significant increase (i.e., plus 5 dB) in traffic noise levels under either Scenario 5 or 6.

NOISE-4 Implementation of the proposed Plan would have the potential to result in indoor noise levels for residential development to exceed an L_{dn} of 45 dB. (Potentially Significant and Mitigable – Scenarios 5 and 6)

February 2016 Draft EIR Findings: Significant for Scenario 1 and potentially significant for Scenarios 2 through 4, requiring mitigation for all four scenarios. Mitigation Measures NOISE-4a and NOISE-4b would apply to all four scenarios and would reduce the impact to a less-than-significant level.

Summary of Supplemental Analysis: The impact would be potentially significant under Scenarios 5 and 6, requiring mitigation. Mitigation Measures NOISE-4a and NOISE-4b would reduce the impact to a less-than-significant level. Mitigation Measure NOISE-4a has been revised, as shown below. These revisions will also be applied to the mitigation for Scenarios 2 through 4. The revisions do not change the original intent or effectiveness of Mitigation Measure NOISE-4a.

Mitigation Measure NOISE-4a: Implement Mitigation Measure NOISE-1a. The following policies and programs, or equally effective language, shall be included in the proposed Plan to ensure that future development under all four scenarios would not result in indoor noise levels that exceed acceptable levels in residential development:

- ~~Policy:~~ Encourage the location of land uses in areas with compatible noise environments. Use the guidelines in the table “Land Use Compatibility for Community Noise Environment” to determine compatibility.

- For exterior noise, the guideline for “normally acceptable” noise levels in residential areas is an L_{dn} of 60 dBA. This level is a guideline for the design and location of future development and a goal for the reduction of noise in existing development. However, 60 dBA L_{dn} is a guideline which cannot necessarily be reached in all residential areas within the constraints of economic or aesthetic feasibility. This guideline will be primarily applied where outdoor use is a major consideration (e.g., backyards in single family housing developments and recreational areas in multiple family housing projects). Where the City determines that providing an L_{dn} of 60 dBA or lower outdoors is not feasible, the noise level in outdoor areas intended for recreational use should be reduced to as close to the standard as feasible through project design.
- For interior noise, the requirements of the State of California Building Standards Code (Title 24) and the Noise Insulation Standards (Title 25) are extended to all new dwelling units in Palo Alto. Specifically, interior levels for all habitable rooms must not exceed an L_{dn} of 45 dBA in all new dwelling units in Palo Alto.

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- ~~– Noise exposure(s) should be determined from (a) more detailed noise exposure studies, or (b) on area-specific or project-specific noise measurements, as appropriate. Noise contour maps in this plan can be used as a preliminary screening tool in determining approximate noise exposure.~~
- ~~▪ Prior to the initial development application for future developments near noise-sensitive land uses, the applicant shall submit an acoustical analysis by an acoustical engineer demonstrating projected compliance with the Comprehensive Plan, the Noise Ordinance, and the State building code. The analysis shall be based on acoustical readings, equipment specifications, architectural designs (even if preliminary), and any proposed sound reduction/insulation measures, such that the pertinent land use compatibility, interior environments, and project-related noise emissions can be demonstrated to comply with prescribed city, county, and state noise standards.~~
- ~~▪ Policy: For all future residential projects greater than four dwelling units that are proposed to be within the 65 dBA L_{dn} noise contours, as depicted on current Comprehensive Plan mapping, an acoustical analysis prepared by a qualified acoustical consultant shall be submitted to the City as part of the entitlement review application. As part of the above acoustical analysis, require that projects include appropriate layout, structural, and/or architectural design features to ensure meeting the interior noise standards of the City and State codes.~~

Mitigation Measure NOISE-4b: The Land Use Noise Compatibility Guidelines established in the current Comprehensive Plan shall be maintained under all ~~four~~ six scenarios.

Citywide and SOI Discussion

As described in the February 2016 Draft EIR, standards for interior noise environments in Palo Alto are currently determined using: the Land Use Noise Compatibility Guidelines (which are established in the Natural and Urban Environment and Safety Element of the existing Comprehensive Plan), as well as by the interior noise standards set by the California Building Code, which is Part 2 of Title 24. Under Scenarios 5 and 6, new development would also be required to adhere to Title 24 requirements.

The Natural Environment Chapter of the existing Comprehensive Plan currently contains policies that are generally intended to minimize community noise impacts as well as to facilitate the juxtaposition of compatible land uses with respect to noise intrusions. However, because the proposed Plan development is still in process, it has not yet been decided which policies would be adopted under Scenarios 5 and 6; therefore, it is unknown whether and how the City's Land Use Compatibility Standards and noise-related policies would be maintained or revised. Additionally, one or more new policies regarding acoustical studies—aimed at ensuring land use compatibility—would be needed to ensure that such impacts would be less than significant. Therefore, the impact for the EIR Study Area is *potentially significant*, requiring mitigation for Scenarios 5 and 6.

Site-Specific Discussion

As described in the February 2016 Draft EIR, the EIR Study Area encompasses a geographically large expanse and includes a diversity of noise environments (from both land uses and roadways). For this reason, it is not feasible to discuss site-level noise impacts in these special areas within the EIR Study Area, in the absence of information about specific proposed development projects. Nevertheless, it can be generally stated that, as Scenarios 5 and 6 allow development and redevelopment activities, all areas within the EIR Study Area have the potential to receive some amount of noise from both highways and major arterials. This would hold true for all six scenarios. It is likely that there are areas where development would require special noise-insulating features or construction techniques. Therefore, for individual sites located within the EIR Study Area, additional project-level acoustical analysis would be necessary to demonstrate consistency with applicable land use compatibility requirements and interior noise standards. Project-level acoustical analyses, at a minimum, would need to examine portions of individual housing sites nearest to major transportation corridors to measure current, 24-hour ambient noise levels and determine appropriate site design and/or construction techniques for noise attenuation. Since the existing Comp Plan policies do not require acoustical analyses to demonstrate compliance with applicable noise compatibility standards and since Chapter 18.23.060 of the Municipal Code does not focus on land use compatibility in its requirements for acoustical studies, new policies would be needed to ensure that such impacts would be less than significant. Therefore, the impact would be *potentially significant*, requiring mitigation under Scenarios 5 and 6.

Applicable Regulations:

- California Code of Regulations, Title 24, Building Standards
- Title 21, Subchapter 6, of the California Code of Regulations
- Palo Alto Municipal Code, Chapter 9.10, Noise
- Palo Alto Municipal Code, Chapter 18.23.060, Noise and Vibration

Significance before Mitigation: Existing Comp Plan policies do not require acoustical analyses to demonstrate compliance with applicable noise compatibility standards and Chapter 18.23.060 of the Municipal Code does not focus on land use compatibility in its requirements for acoustical studies. Therefore, development under Scenarios 5 and 6 may result in interior noise environments in excess of the pertinent building standards guidelines and requirements. Thus, interior noise impacts would be potentially significant under Scenarios 5 and 6 and the proposed Plan should include one or more policies regarding acoustical analyses for land use compatibility.

Mitigation Measures

Mitigation Measures NOISE-4a and NOISE-4b would apply to Scenarios 5 and 6.

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Significance after Mitigation: Less than Significant. Implementation of Mitigation Measures NOISE-4a and NOISE-4b would ensure that pertinent exterior and interior noise environments would comply with City guidelines and State standards.

Analysis conducted to understand the effect of implementing mitigation measures shows that, under post-mitigation conditions, the additional policies and guidelines called for in Mitigation Measures NOISE-4a and NOISE-4b would ensure that pertinent exterior and interior noise environments would comply with City guidelines and State standards.

NOISE-5 Implementation of the proposed Plan would have the potential to expose persons to or generate excessive ground-borne vibration or ground-borne noise levels. (Potentially Significant and Mitigable – Scenarios 5 and 6)

February 2016 Draft EIR Findings: Significant for Scenario 1 and potentially significant for Scenarios 2 through 4, requiring mitigation for all four scenarios. Mitigation Measures NOISE-5a and NOISE-5b would apply to all four scenarios and would reduce the impact to a less-than-significant level.

Summary of Supplemental Analysis: The impact would be potentially significant under Scenarios 5 and 6, requiring mitigation. Mitigation Measures NOISE-5a and NOISE-5b would reduce the impact to a less-than-significant level. Mitigation Measure NOISE-5a has been revised, as shown below. These revisions will also be applied to the mitigation for Scenarios 1 through 4. The revisions do not change the original intent or effectiveness of Mitigation Measure NOISE-5a.

Mitigation Measure NOISE-5a: ~~The following policies, or equally effective language, shall be included in the proposed Plan. To ensure that future development under all four scenarios would not result in significant construction-related vibration impacts, the proposed Plan shall include policies that address the following topics:-~~

- Requirements for construction and operations vibration impact analysis, to be prepared by a qualified acoustical consultant for development projects.
- Requirements for vibration mitigation plans to ensure compliance with the pertinent industry standards and City guidelines for projects that would experience vibration impacts during construction or operations.
- Limits for construction and operations vibration around vibration-sensitive receptors.
- ~~Policy: Require a detailed construction noise impact analysis, prepared by a qualified acoustical consultant, for all projects that require discretionary approval and that are located within 100 feet of any noise sensitive land uses. If impacts are identified, require a noise monitoring plan to be prepared and submitted prior to the issuance of construction permits. This plan shall identify the monitoring locations, durations and regularity, the instrumentation to be used, and the appropriate noise control measures that will be incorporated to ensure compliance with the noise ordinance.~~

~~Policy: Continue to prioritize construction noise limits around sensitive receptors.~~

Mitigation Measure NOISE-5b: Implement Mitigation Measure NOISE-1c.

As described in the February 2016 Draft EIR, in Palo Alto, groundborne vibration can be related to (a) short-term impacts from construction activities or (b) on-going impacts related to operation of a permanent land use (such as a commercial or industrial facility) or (c) on-going impacts related to rail pass-bys. However, there would be no impacts related to either roadway or aircraft facilities under any of the six scenarios.

Short-Term Construction-Related Vibration Impacts

Vibration generated by construction equipment has the potential to be substantial and significant vibration impacts may potentially occur from construction activities associated with new development under the proposed Plan. Under Scenarios 5 and 6, the proposed Plan would allow an increase in development intensity in certain areas.

Overall, vibration impacts related to construction would be short-term, temporary, and generally restricted to the areas in the immediate vicinity of active construction equipment. Methods to reduce vibration during construction would include the use of smaller equipment, use of well-maintained equipment, use of static rollers instead of vibratory rollers, and drilling of piles as opposed to pile driving. Methods to reduce human impacts of vibration from construction include limitations on construction hours and/or guidelines for the positioning of vibration-generating construction equipment. Construction would be localized and would occur intermittently for varying periods of time. Because specific, project-level information is not available at this time, it is not possible to quantify the construction vibration impacts at specific sensitive receptors. Therefore, individual project review would be needed to ensure appropriately reduced vibration impacts arising from construction. Therefore, the impact could be potentially significant, requiring mitigation under Scenarios 5 and 6.

On-Going Operations Vibration Impacts

Development that would be allowed under Scenarios 5 and 6 may result in long-term, operations-related vibration impacts to sensitive receptors if sensitive land uses were to be located in close proximity to industrial land uses that could have equipment with the potential to generate significant vibration levels. Neither Scenario 5 nor 6 include changes to the City's Comprehensive Plan land use map. Thus, under Scenarios 5 and 6, there would continue to be limited areas of the EIR Study Area where residential or other sensitive land uses would interface with light industrial operations under the Comprehensive Plan land use designations. Despite the potential for vibration impacts from this juxtaposition of land uses, measures such as appropriate setbacks, buffers, and use restrictions can largely eliminate these impacts. In addition, the light industrial uses of the sort that would continue to be permitted in Palo Alto under the proposed Plan are very rarely associated with vibration that is sufficiently intense or sustained so as to cause either human discomfort or architectural/structural damage.

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Although there are no State or federal regulations to limit perception of vibration by sensitive receptors, the proposed Plan would continue Municipal Code provisions that would employ strategies to prevent vibration impacts. Chapter 18.23.060 of the Municipal Code contains general restrictions regarding the generation of vibration that is perceptible without instruments at the lot line of the receiving property. However, under Scenarios 5 and 6, new policies would be needed to ensure that buildout of land uses allowed by the proposed Plan would not result in the perception by sensitive receptors of excessive vibration (and noise). Because the proposed Plan development is still in process, it has not yet been decided which policies will be adopted under Scenarios 5 and 6 and, therefore, it is unknown whether proposed Plan policies would address and prevent on-going vibration impacts from operation of land uses. Therefore, the impact is potentially significant for Scenarios 5 and 6.

On-Going Railway Pass-By Vibration Impacts

Development allowed by the proposed Plan may result in long-term vibration impacts if sensitive land uses were allowed to be developed in close proximity to existing railways. While vibration impacts related to rail pass-bys would be short-term, temporary, and generally restricted to the areas in the immediate vicinity of a railway, vibration effects from on-going rail pass-bys could be objectionable. These vibration effects can range from no perceptible effects at the lowest vibration levels, to low rumbling sounds and perceptible vibrations at moderate levels, to slight structural damage at the highest levels. Vibration from rail pass-bys rarely reaches the levels that can damage structures, but groundborne vibration and groundborne noise can reach perceptible and audible levels in buildings that are close to railways. As such, appropriate setbacks, buffers, and/or other measures can largely eliminate these impacts since these basic techniques are particularly effective approaches to avoid vibration impacts. However, additional efforts would be needed to ensure that no new development of vibration-sensitive uses would be allowed. Specifically, individual project review would be needed to ensure appropriately reduced vibration impacts arising from rail pass-bys. Therefore, the impact could be potentially significant, requiring mitigation under Scenarios 5 and 6.

Vibration Impact Summary

Temporary construction-related vibration, long-term operational vibration, and impacts related to railway vibration would be *potentially significant* under Scenarios 5 and 6, requiring mitigation. Neither Scenario 5 nor Scenario 6 would result in impacts related to either roadway or aircraft facilities.

Applicable Regulations:

- California Code of Regulations, Title 24, Building Standards
- Palo Alto Municipal Code, Chapter 18.23.060

Significance before Mitigation: Development under Scenarios 5 and 6 may result in groundborne vibration levels above the pertinent industry standards and City guidelines. Impact associated with temporary construction-related vibration, long-term operational vibration, and railway-related vibration

under Scenarios 5 and 6 would be potentially significant, requiring mitigation. There would be no impacts related to either roadway or aircraft facilities.

Mitigation Measures

Mitigation Measures NOISE-5a and NOISE-5b would apply to Scenarios 5 and 6.

Significance after Mitigation: Less than Significant. The additional policies of the proposed Plan—including implementation of Mitigation Measures NOISE-5a and NOISE-5b—would ensure that pertinent groundborne vibration environments would comply with City guidelines.

Analysis conducted to understand the effect of implementing mitigation measures shows that, under post-mitigation conditions, the additional policies called for in Mitigation Measures NOISE-5a and NOISE-5b would ensure that pertinent groundborne vibration environments would comply with City guidelines.

NOISE-6 Implementation of the proposed Plan would have the potential to expose people to noise levels in excess of established State standards. (Potentially Significant and Mitigable – Scenarios 5 and 6)

February 2016 Draft EIR Findings: Potentially significant under Scenarios 1 through 4, requiring mitigation. Mitigation Measure NOISE-6 reduces the impact to a less-than-significant level.

Summary of Supplemental Analysis: The impact would be potentially significant under Scenarios 5 and 6, requiring mitigation. Mitigation Measure NOISE-6 would reduce the impact to a less-than-significant level.

Mitigation Measure NOISE-6: Implement Mitigation Measures NOISE-4a and NOISE-4b.

Standards for interior noise environments in the City of Palo Alto are currently determined primarily through the Land Use Noise Compatibility Guidelines (which are established in the Natural and Urban Environment and Safety Element of the existing Comprehensive Plan), as well as by the interior noise standards set by the Title 24 of the State Building Code. For the former, it should be noted that per the recent California Supreme Court decision regarding the assessment of the environment’s impacts onto proposed projects (*CBIA v BAAQMD*, issued December 17, 2015),² it is generally no longer the purview of the CEQA process to evaluate the impact of existing environmental conditions onto any given project. For noise, the application of this ruling means that the analysis of traffic, rail, and aircraft noise effects at the project site – regarding land use compatibility issues – is no longer a required part of CEQA. However, the ruling does not preclude or prohibit such a compatibility assessment. As such, for a complete, thorough, and informative presentation, the City of Palo Alto has voluntarily elected to include a presentation of potential

² California Supreme Court. *California Building Industry Association v. Bay Area Air Quality Management District* (2015) [Case No. S213478]

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noise impacts from non-project sources³ onto citywide receptors with regard to land use compatibility issues.

For compliance with State interior sound environment regulations and as discussed under Impact NOISE-4 (above), in areas where noise levels exceed those that are normally acceptable for a particular land use, new policies under the proposed Plan would be needed to ensure that interior noise environments would comply with the 45 dBA L_{dn} State standard. As future development occurs under Scenarios 5 and 6, project-level acoustical analyses would be necessary to demonstrate consistency with applicable land use compatibility requirements (per Impact NOISE-4) and interior noise standards (per Impact NOISE-6). Since the existing Comprehensive Plan policies do not require acoustical analyses to demonstrate compliance with applicable noise compatibility standards (neither exterior nor interior), new policies would be needed to ensure that such impacts would be less than significant. Therefore, the impact would be *potentially significant*, requiring mitigation under Scenarios 5 and 6.

Applicable Regulations:

- California Code of Regulations, Title 24, Building Standards

Significance before Mitigation: Development under Scenarios 5 and 6 may result in interior noise environments in excess of the pertinent State building standards requirements. Interior noise impacts were found to be potentially significant under these scenarios. For Scenarios 5 and 6, the proposed Plan should include one or more policies regarding acoustical analyses for land use compatibility and the associated interior noise characteristics.

Mitigation Measures

Mitigation Measure NOISE-6 would apply to Scenarios 5 and 6.

Significance after Mitigation: Less than Significant. The additional policies of the proposed Plan – including implementation of Mitigation Measures NOISE-4a and NOISE-4b via Mitigation Measure NOISE-6 – would ensure that pertinent exterior and interior noise environments would comply with City guidelines and State standards.

Analysis conducted to understand the effect of implementing mitigation measures shows that, under post-mitigation conditions, the additional policies called for in Mitigation Measure NOISE-4a (via Mitigation Measure NOISE-6) would ensure that pertinent exterior and interior noise environments would comply with City guidelines and State standards.

³ Primarily large-scale environmental noise sources such as roadway networks, railways, and airports.

NOISE-7 Implementation of the proposed Plan would have the potential to result in the exposure of persons to or generation of noise levels in excess of standards established in the local General Plan or noise ordinance, or applicable standards of other agencies. (Potentially Significant and Mitigable – Scenarios 5 and 6)

February 2016 Draft EIR Findings: Potentially significant for Scenarios 1 through 4, requiring mitigation. Mitigation Measure NOISE-7 would reduce the impact to a less-than-significant level.

Summary of Supplemental Analysis: The impact would be potentially significant under Scenarios 5 and 6, requiring mitigation. Mitigation Measure NOISE-7 would reduce the impact to a less-than-significant level.

Mitigation Measure NOISE-7: Implement Mitigation Measures NOISE-1a, NOISE-1b, NOISE-1c, NOISE-4a, and NOISE-4b.

The EIR Study Area encompasses a geographically large expanse and includes a diversity of noise environments (from both land uses and roadways). Nevertheless, it can be generally stated that all study areas have the potential to receive some amount of noise from both highways and major arterials. Because all of the study areas are at least partly located in close proximity to major arterial(s) or a highway, it is likely that there are portions of all study areas where development would require special noise-insulating features or construction techniques. Therefore, for individual sites located within all study areas, additional project-level acoustical analyses would be necessary to demonstrate consistency with applicable land use compatibility requirements and interior noise standards (including the determination of appropriate site design and/or construction techniques for noise attenuation).

Standards for noise generation and exposure in Palo Alto are determined primarily through the Comprehensive Plan Land Use Noise Compatibility Guidelines; Chapters 9.10 and 18.23.060 of the Palo Alto Municipal Code; as well as by the interior noise standards set by the California Building Code, which is Part 2 of Title 24. In addition to the guidelines for land use noise compatibility, the City of Palo Alto's Municipal Code noise limits by use are defined in terms of the amount by which the noise level exceeds the local ambient level, and this regulatory approach would continue under the proposed Plan.

Standards for noise generation and exposure outside of the city limit, but within the SOI, would be covered by County of Santa Clara standards. Similar to the City standards, County standards are determined primarily through the County Land Use Noise Compatibility Guidelines; Chapter VIII, *Control of Noise and Vibration*, under Title B of the Santa Clara County Code (mainly Section B11-152); as well as by the interior noise standards set by the Title 24 of the State Building Code. While the County's General Plan – like the City's Comprehensive Plan – establishes the guidelines for land use noise compatibility based on exterior sound levels, the County's General Plan extends their standards by also promoting recommended maximum interior noise levels for intermittent noise. In addition to these exterior and interior guidelines for land use

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noise compatibility, the County of Santa Clara’s Code establishes noise limits for both exterior and interior spaces. Both the County’s policy and regulatory approaches would continue under the proposed Plan.

Since the existing Comprehensive Plan policies do not require acoustical analyses to demonstrate compliance with applicable noise compatibility standards and since Chapter 18.23.060 of the Municipal Code does not focus on land use compatibility in its requirements for acoustical studies, new policies would be needed to ensure that such impacts would be less than significant. Therefore, the impact could be *potentially significant*, requiring mitigation under Scenarios 5 and 6.

Applicable Regulations:

- California Code of Regulations, Title 24, Building Standards
- Title 21, Subchapter 6, of the California Code of Regulations
- Palo Alto Municipal Code, Chapter 9.10, Noise
- Palo Alto Municipal Code, Chapter 18.23.060, Noise and Vibration
- Santa Clara County General Plan, Land Use Noise Compatibility Guidelines
- Santa Clara County Code, Section B11-152

Significance before Mitigation: Development under Scenarios 5 and 6 may result in community noise environments in excess of the pertinent Comprehensive Plan, Municipal Code, and/or State building requirements. This pertains to citywide and project-specific developments, but since none of the scenarios of the proposed Plan would change any requirements under the County of Santa Clara General Plan or Code, there would be no impact under the proposed Plan for areas outside of the city limits, but within the Plan’s SOI area.

Mitigation Measures

Mitigation Measure NOISE-7 would apply to Scenarios 5 and 6.

Significance after Mitigation: Less than Significant. The additional policies of the proposed Plan – including implementation of Mitigation Measures NOISE-1a, NOISE-1b, NOISE-1c, NOISE-4a, and NOISE-4b via Mitigation Measure NOISE-7 – would ensure that pertinent exterior and interior noise environments would comply with City and County guidelines, as well as with State standards.

Analysis conducted to understand the effect of implementing mitigation measures shows that, under post-mitigation conditions, the additional policies called for in Mitigation Measure NOISE-7 would ensure that pertinent exterior and interior noise environments would comply with City guidelines and State standards.

NOISE-8	Implementation of the proposed Plan could result in a potentially substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project. (Potentially Significant and Mitigable – Scenarios 5 and 6)
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February 2016 Draft EIR Findings: Potentially significant for Scenarios 1 through 4, requiring mitigation. Mitigation Measure NOISE-8 would reduce the impact to a less-than-significant level.

Summary of Supplemental Analysis: The impact would be potentially significant under Scenarios 5 and 6, requiring mitigation. Mitigation Measure NOISE-8 would reduce the impact to a less-than-significant level. Mitigation Measure NOISE-8 has been revised, as shown below. These revisions will also be applied to the mitigation for Scenarios 1 through 4. The revisions do not change the original intent or effectiveness of Mitigation Measure NOISE-8.

Mitigation Measure NOISE-8: ~~The following policies, or equally effective language, shall be included in the proposed Plan + T to ensure that future development under all four scenarios would not result in significant impacts to sensitive receptors from construction noise and vibration. The proposed Plan shall include policies that address the following topics:~~

- Construction noise limits around sensitive receptors.
- Monitoring and reporting plans for construction noise levels of larger development projects.
- Noise control measures to ensure compliance with the noise ordinance.
- ~~Policy: Require a detailed construction noise and vibration impact analysis, prepared by a qualified acoustical consultant, for all projects that require discretionary approval and that are located within 100 feet of any noise and/or vibration-sensitive land uses.~~
 - ~~If noise impacts are identified, require a noise monitoring plan to be prepared and submitted prior to the issuance of construction permits. This plan shall identify the noise monitoring locations, durations and regularity, the instrumentation to be used, and the appropriate noise control/mitigation measures that will be incorporated to ensure compliance with the noise ordinance.~~
 - ~~If projected daytime vibration levels exceed 90 VdB (relative to one microinch/sec) at workshop uses, 84 VdB at offices uses, 78 VdB at residential uses, or the limits for VC-A through VC-E uses shown in the FTA manual,⁴ a vibration mitigation plan is to be prepared and submitted prior to the issuance of construction permits.~~
 - ~~Policy: Continue to prioritize construction noise and vibration limits around sensitive receptors.~~

Noise from construction equipment and various construction-related activities is frequently a cause of temporary or periodic increases in ambient noise levels. Palo Alto Municipal Code Chapter 9.10.060 serves

⁴ These are found in Chapter 8 of the FTA manual (2006 edition), Table 8-3 “Interpretation of Vibration Criteria for Detailed Analysis”. Uses VC-A through VC-E are for vibration-sensitive equipment such as optical microscopes, electron microscopes, and lithography equipment. The associated limits range from 66 to 42 VdB, respectively.

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to regulate noise from construction and related activities in Palo Alto.⁵ Although the noise ordinance would serve to reduce noise generation from construction equipment, it is likely that in certain cases these and other available methods to reduce noise would be inadequate to prevent a significant impact. Thus, it is possible that certain construction activities under Scenarios 5 and 6 may lead to substantial temporary or periodic increases to ambient noise levels, resulting in *potentially significant* impacts which would require mitigation.

Applicable Regulations:

- California Code of Regulations, Title 24, Building Standards
- Palo Alto Municipal Code, Chapter 9.10.060, Special Provisions.

Significance before Mitigation: Since it is possible that certain construction activities under Scenarios 5 and 6 may lead to substantial temporary or periodic increases to ambient noise levels, potentially significant impacts could result.

Mitigation Measures

Mitigation Measure NOISE-8 would apply to Scenarios 5 and 6.

Significance after Mitigation: Less than Significant. The additional policies of the proposed Plan – including implementation of Mitigation Measure NOISE-8 – would ensure that temporary or periodic increases to ambient noise levels would be significantly reduced. Thus, after implementation of the new policies, such impacts would be less than significant.

Analysis conducted to understand the effect of implementing mitigation measures shows that, under post-mitigation conditions, the additional policies called for in Mitigation Measure NOISE-8 would ensure that temporary or periodic increases to ambient noise levels would be significantly reduced.

NOISE-9	For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, the project would not expose people residing or working in the project area to excessive noise levels. (Less than Significant – Scenarios 5 and 6)
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February 2016 Draft EIR Findings: Less than significant for Scenarios 1 through 4.

Summary of Supplemental Analysis: The impact would be less than significant under Scenarios 5 and 6.

⁵ The ordinance allows construction between the hours of 8:00 AM and 6:00 PM, Monday through Friday, and between 9:00 AM and 6:00 PM on Saturday. Construction is prohibited on Sundays and federal holidays. In addition to restrictions on hours of activity, no individual piece of construction equipment may generate noise in excess of 110 dBA at a distance of 25 feet, and the noise level outside of the property may not exceed 110 dBA.

As described in the February 2016 Draft EIR, the City of Palo Alto owns and operates the Palo Alto Airport (KPAO), a relatively small public air facility which primarily serves single-engine, general aviation (GA) aircraft.⁶ Noise contours from the aircraft using this airport have been incorporated into the existing citywide contours shown in Figure 4.10-4 of the February 2016 Draft EIR. At the nearest points within city limits, Palo Alto is located approximately 2.6 miles to the west of Moffett Federal Airfield (KNUQ), 6 miles to the southeast of San Carlos Airport (KSQL), 10 miles to the northwest of the San Jose International Airport (SJC), 15 miles to the southeast of San Francisco International Airport (SFO), and 17 miles to the south of Oakland International Airport (OAK). Additional small airports in the vicinity include the Hayward Executive Airport (KHWD), 14 miles away, and the Half Moon Bay airport (KHAF), 18 miles away. At these relatively large distances, all areas of Palo Alto are miles outside of the pertinent 65 dBA CNEL noise contour of all of these airports (see Figure 4.10-4 in the February 2016 Draft EIR).

The Palo Alto Airport Comprehensive Land Use Plan (CLUP) was adopted in November 2008⁷ by the Santa Clara County Airport Land Use Commission (ALUC)⁸ and provides guidance related to the placement of land uses near the Palo Alto Airport.⁹ Based on the noise contours presented in the Palo Alto Airport CLUP, only airport and golf course land uses fall within the Palo Alto Airport's 60 dBA noise contour. These properties lie between the 60 and 65 CNEL contours, and therefore would not exceed the "Normally Acceptable" noise levels for compatibility for those land uses. Additionally, these land uses within the EIR Study Area are not noise-sensitive and, therefore, KPAO aircraft noise levels for in-city air facilities would be *less than significant*.

Applicable Regulations:

- None

Significance before Mitigation Since all areas of Palo Alto are well below the pertinent 65 dBA CNEL noise level impact threshold,¹⁰ out-of-city public airport noise impacts would be less than significant. Further, since only airport property and the golf course – neither of which are noise-sensitive land uses – are within the airport's 60 dBA CNEL noise contours, within-city public airport noise impacts would also be less than significant.

⁶ Information from AirNav.com at <http://www.airnav.com/airport/KPAO>, accessed on December 23, 2015

⁷ At the time of the preparation of the ALUC document, Palo Alto airport was owned and operated by the County of Santa Clara.

⁸ Santa Clara County Airport Land Use Commissions, 2008, Palo Alto Airport Comprehensive Land Use Plan.

⁹ The CLUP seeks to protect the public from adverse effects of aircraft noise, to ensure that people and facilities are not concentrated in areas susceptible to aircraft accidents, and to ensure that no structures or activities adversely affect navigable airspace.

¹⁰ The standard metric used for community impact assessment is the 24-hour CNEL metric and the 65 dBA CNEL level; as required by statute for general plan noise elements, Title 24 for interior noise levels, and per FAA regulations (see the discussion above under State Regulations in Section 4.10.1.2 of the February 2016 Draft EIR for additional information about applicable exterior and interior noise level standards regarding aircraft noise). This Draft EIR uses the mandated noise metric in the consideration of potential aircraft-related noise impacts.

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NOISE-10 For a project within the vicinity of a private airstrip, the project would not expose people residing or working in the project area to excessive noise levels. (Less than Significant – Scenarios 5 and 6)

February 2016 Draft EIR Findings: Less than significant for Scenarios 1 through 4.

Summary of Supplemental Analysis: The impact would be less than significant under Scenarios 5 and 6.

The only standalone heliport located within the EIR Study Area is the Stanford University heliport (15CA), which is located at Stanford University Hospital adjacent to the Stanford Campus near Quarry Road and Campus Drive. The nearest residential uses are located approximately 1,400 feet to the west of the heliport.

Other, private aircraft facilities that are outside of the EIR Study Area include McCandless Towers Heliport (CL86) at approximately 8 miles to the southeast of Palo Alto (in Santa Clara County) and Moffett Federal Airfield (KNUQ), which is approximately 2.6 miles to the east of the nearest points of the Palo Alto city limits.

The above fields/heliports are the only private air facilities within 20 miles of Palo Alto. Due to the small number of flights operating at these private airstrips or heliports, coupled with the distances to the nearest noise-sensitive receptors within the EIR Study Area, the noise level impacts due to operations at these facilities would be *less than significant*.

Applicable Regulations:

- None

Significance before Mitigation With relatively large distances to the nearest noise-sensitive receptors within the EIR Study Area and with relatively few flights operating at private airstrips or heliports, noise level impacts due to operations at these private facilities under Scenarios 5 and 6 would be *less than significant*.

4.10.4 CUMULATIVE IMPACTS

NOISE-11 Implementation of the proposed Plan, in combination with past, present, and reasonably foreseeable projects, may result in significant cumulative impacts with respect to noise. (Potentially Significant and Mitigable – Scenarios 5 and 6)

February 2016 Draft EIR Findings: Cumulative impacts would be less than significant for Scenarios 1 through 4 for foreseeable traffic-related noise, since cumulative impacts were inherently accounted for in the assessments under Impacts NOISE-1, NOISE-2, and NOISE-3. However, due to uncertain future development details near pertinent railway and airport facilities, as well as unknown noise emissions

characteristics of these rail- and air-related services, cumulative community noise levels could be potentially significant, requiring mitigation for all four scenarios. Mitigation Measures NOISE-11a through NOISE-11c would reduce this cumulative impact to a less-than-significant level.

Summary of Supplemental Analysis: Cumulative community noise impacts would be potentially significant under Scenarios 5 and 6. Mitigation Measures NOISE-11a through NOISE-11c would reduce this cumulative impact to a less-than-significant level. Mitigation Measure NOISE-11b has been revised, as shown below. These revisions will also be applied to the mitigation for Scenarios 1 through 4. The revisions do not change the original intent or effectiveness of Mitigation Measure NOISE-11b.

Mitigation Measure NOISE-11a: Implement Mitigation Measure NOISE-1c.

Mitigation Measure NOISE-11b: ~~The following programs, or equally effective language, shall be included in the proposed Plan.~~ To preclude overall community noise impacts that are in excess of established State and/or City standards, the proposed Plan shall include policies that address the following topics:-

- Technological methods to reduce train whistle noise from Caltrain.
- Evaluation of at-grade rail crossings as potential Quiet Zones based on Federal Railroad Administration (FRA) rules and guidelines.
- Grade separation of rail crossings as a City priority.
- ~~Program: Encourage the Joint Powers Board to pursue technologies to reduce train whistle noise in communities served by Caltrain.~~
- ~~Program: Evaluate changing at-grade rail crossings so that they qualify as Quiet Zones based on Federal Railroad Administration (FRA) rules and guidelines in order to mitigate the effects of train horn noise without adversely affecting safety at railroad crossings.~~

Mitigation Measure NOISE-11c: City of Palo Alto staff and officials shall participate in and contribute to the environmental impact assessment of future Caltrain and HSR development programs for railway operations within the city's SOI.

The analysis of the proposed Plan, discussed above, addresses cumulative impacts with regard to noise, as well as groundborne noise and vibration. Although multiple simultaneous nearby noise sources may, in combination, result in higher overall noise levels, this effect is captured and accounted for by the ambient noise level metrics which form the basis of the Standards of Significance for noise analysis. Any measurement of sound or ambient noise, whether for the purpose of evaluating land use compatibility, establishing compliance with exterior and interior noise standards, or determining point-source violations of a noise ordinance, necessarily will incorporate noise from all other nearby perceptible sources.

NOISE

Additionally, although noise attenuation is influenced by a variety of topographical, meteorological, and other factors, noise levels decrease relatively rapidly with distance, and vibration impacts decrease even more rapidly. Therefore, site-level cumulative noise or vibration impacts across city boundaries occur only infrequently. The City of Palo Alto shares borders with other incorporated communities and similarly urbanized areas, which makes cross-border cumulative noise and vibration impacts possible. Nevertheless, given the Municipal Code requirements discussed above, it is unlikely that operations-related noise would, in combination with noise sources from adjacent cities, result in cumulative noise impacts. Additionally, because any noise measurements taken in conjunction with Municipal Code requirements would necessarily account for noises received from outside the boundaries of the City of Palo Alto, the ongoing implementation of these policies and regulations under the proposed project would serve to prevent site-based cumulative noise impacts.

Similarly, the traffic-related noise levels developed for the proposed Plan include and account for regional travel patterns as they affect traffic levels in Palo Alto. Noise contours were based upon both existing and projected future traffic volumes that incorporate cumulative regional effects and trends. Existing noise contours were derived from traffic volumes based on counts of current traffic, and these traffic counts inherently include cumulative traffic, as generated by regional trips. For future noise, projected noise contours were determined using projected 2030 traffic volumes; these data account for growth both within the EIR Study Area under the proposed Plan, as well as anticipated regional growth. The future noise modeling which served as the foundation for the overall Project analysis was therefore based on future, cumulative conditions. Therefore, Impact NOISE-3 encompasses and addresses cumulative noise impacts from implementation of the proposed Plan. As discussed under Impacts NOISE-1, NOISE-2, and NOISE-3, buildout of the proposed Plan under Scenarios 5 and 6 would remain within the City of Palo Alto's *Environmental Criteria Used by the City of Palo Alto* (of 2007) and impacts due to cumulative traffic noise increases would be *less than significant*.

However, the development of the Caltrain Modernization Program and the California HSR network (discussed in Section 4.10.1.3 of the February 2016 Draft EIR) may result in increases in the community noise environment within parts of Palo Alto. However, there is currently a lack of detailed information about both future electrified Caltrain or HSR operations and, as a result, a definitive conclusion about future noise levels cannot be made at this time. Lastly, it should also be kept in mind that neither the Caltrain Modernization Program, nor the development of the California HSR system are part of this proposed Plan and the associated environmental impacts for these two rail projects in the cumulative setting are not included herein (since such impact analyses have been or will be conducted separately by the respective rail authorities). Nonetheless, cumulative impacts from future regional growth and future railway development/improvement programs could result in community noise levels that may be *potentially significant*.

Likewise, uncertain or unknown factors with respect to future land use development around or operations associated with local airports, could potentially result in unacceptable aircraft-related noise environments from one or both of the Palo Alto-based aircraft facilities (i.e., Stanford University Medical Center Heliport

and Palo Alto Airport). Thus, future aircraft-related conditions, in combination with cumulatively rising noise environments from non-aircraft sources, could result in a *potentially significant* impact under Scenarios 5 and 6. Note, though, that noise from medium or large airports in the region (including Moffett Airfield, San Carlos Airport, San Jose Airport, Oakland International Airport, and San Francisco International Airport) – while being audible and potentially annoying or intrusive to some people – would not contribute to cumulative impacts with respect to CEQA evaluations, as the relevant noise characteristics of these facilities are many miles outside of the EIR Study Area.

Applicable Regulations:

- California Code of Regulations, Title 24, Building Standards
- Palo Alto Municipal Code: Chapter 9.10, Noise

Significance before Mitigation: Development under Scenarios 5 and 6 may result in cumulative noise environments in excess of the pertinent city and state guidelines and requirements. Thus, cumulative impacts from future regional growth, future railway development/improvement programs, and/or future interaction with local, aircraft-related facilities could result in community noise levels that may be *potentially significant*. Therefore, the proposed Plan – relative to Scenarios 5 and 6 – should include one or more policies regarding acoustical analyses for land use compatibility and the associated interior noise characteristics.

Mitigation Measures

Mitigation Measures NOISE-11a, NOISE-11b, and NOISE-11c would apply to Scenarios 5 and 6.

Significance after Mitigation: Less than Significant. The policies of the proposed Plan (Mitigation Measure NOISE-11a and NOISE-11b), coupled with the vigilance of the City regarding future railway development and pursuit of grade separation for rail crossings along the rail corridor (Mitigation Measure NOISE-11c) would serve to minimize the possibility for community-wide ambient noise increases due to cumulative sources. After implementation of the new policies and mitigation measures, impacts from cumulative noise increases would be less than significant.

Analysis conducted to understand the effect of implementing mitigation measures shows that, from the viewpoint of cumulative noise impacts, under post-mitigation conditions, the additional policies and actions called for in Mitigation Measures NOISE-11a through NOISE-11c would ensure that pertinent exterior and interior noise environments would comply with City guidelines and State standards.

NOISE