

4.10 NOISE

4.10.1 Environmental Setting

a. Overview of Noise. Sound is technically described in terms of the loudness (amplitude) of the sound and frequency (pitch) of the sound. The standard unit of measurement of the loudness of sound is the decibel (dB). Since the human ear is not equally sensitive to sound at all frequencies, a special frequency-dependent rating scale has been devised to relate noise to human sensitivity. The A-weighted decibel scale (dBA) performs this compensation by discriminating against frequencies in a manner approximating the sensitivity of the human ear.

Decibels are based on the logarithmic scale. The logarithmic scale compresses the wide range in sound pressure levels to a more usable range of numbers in a manner similar to the Richter scale used to measure earthquakes. In terms of human response to noise, a sound 10 dBA higher than another is judged to be twice as loud; a sound 20 dBA higher is four times as loud, and so forth. Everyday sounds normally range from 30 dB (very quiet) to 100 dB (very loud). In general, a 3 dB change in noise levels is noticeable, while 1-2 dB changes are generally not perceived. A 5 dBA increase is readily noticeable, while a difference of 10 dBA would be perceived as a doubling of loudness. Noise levels typically attenuate at a rate of 6 dBA per doubling of distance from point sources such as industrial machinery. Noise from lightly traveled roads typically attenuates at a rate of about 4.5 dBA per doubling of distance. Noise from heavily traveled roads typically attenuates at about 3 dBA per doubling of distance.

In addition to the actual instantaneous measurement of sound levels, the duration of sound is important since sounds that occur over a long period of time are more likely to be an annoyance or cause direct physical damage or environmental stress. Several rating scales have been developed to account for the known effects of noise on people. Based on these effects, the observation has been made that the potential for noise to impact people is dependent on the total acoustical energy content of the noise. A number of noise scales have been developed to account for this factor. These scales include the Equivalent Noise Level (Leq), the Day Night Noise Level (Ldn) and the Community Noise Equivalent Level (CNEL).

Leq is the sound level corresponding to a steady-state sound level containing the same total energy as a time-varying signal over a given sample period. Leq is the “energy” average noise level during the time period of the sample. Leq can be measured for any time period, but is typically measured for 15 minutes, 1 hour, or 24 hours.

Ldn is a 24-hour, time-weighted average noise level. Time-weighted refers to the fact that noise which occurs during certain sensitive time periods is penalized for occurring at these times. In the Ldn scale, those events that take place during the night (10 p.m. to 7 a.m.) are penalized by 10 dBA. This penalty was selected to attempt to account for increased human sensitivity to noise during the quieter period of day, where sleep is the most probable activity.

CNEL is similar to the Ldn scale except that it includes an additional 5 dBA penalty for events that occur during the evening (7 p.m. to 10 p.m.) time period. Thus, both the Ldn and CNEL noise measurements represent a 24-hour average of A-weighted noise levels with Ldn

providing a nighttime adjustment and CNEL providing both an evening and nighttime adjustment.

b. Sensitive Receptors. Noise level allowances for various types of land uses reflect the varying noise sensitivities associated with those uses. In general, noise-sensitive land uses (“sensitive receptors”) are any residence, hospital, school, hotel, library, office, or similar facility where quiet is an important attribute of the environment. Such uses have more stringent noise level allowances than most commercial or agricultural uses that are not subject to impacts such as sleep disturbance. Sensitive receptors along the MBSST Network corridor vary from segment to segment, and include residences, places of worship, schools, hospitals, and offices.

Passive parks are generally considered noise-sensitive because they typically involve activities that would be sensitive to noise, such as reading or conversation. On the other hand, parks used for active recreational purposes, similar to the proposed MBSST Network, are generally not considered noise-sensitive as they usually involve sport activities or other active recreational pursuits. The County of Santa Cruz designates a “normally acceptable”¹ outdoor noise limit of 65 dB Ldn (or CNEL) for outdoor sports venues, neighborhood parks, and playgrounds. The cities of Santa Cruz, Capitola, and Watsonville each designate a normally acceptable outdoor noise limit of 70 dB Ldn (or CNEL) for playgrounds and neighborhood parks. None of the jurisdictions within the MBSST Network area designate an active recreational trail as noise-sensitive, nor establish noise limits for such a use. Therefore, for the purpose of this analysis, the proposed MBSST Network project is not considered a noise sensitive land use.

Sensitive receptors nearest to each of the project’s three reaches are described below.

Northern Reach. The northern reach is rural in nature, with coastal bluffs and agricultural areas. Developed areas adjacent to the northern reach are limited to the community of Davenport. The nearest sensitive receptors to the northern reach, as shown in Figure 4.10-1a, include Davenport residences along Cement Plant Road, approximately 150 feet north of segment 4. Pacific Elementary School is also located near the northern reach, approximately 300 feet north of sub-segment 5.1.

Central Reach. The central reach primarily traverses the existing urban neighborhoods of Santa Cruz, Capitola, and Aptos. Sensitive receptors in close proximity to the central reach include residences as close as 50 feet from the proposed alignment, as well as places of worship and schools. Figure 4.10-1b depicts the locations of the closest sensitive receptors to the central reach. As shown, the closest sensitive receptors include residences within 50 feet of segment seven. Other nearby sensitive receptors include residences along segments 9 through 14; a church located approximately 250 feet north of segment 12; and Shoreline Middle School, located approximately 400 feet south of the southern terminus of segment 9.

Watsonville Reach. The Watsonville reach passes through some residential areas near Manresa State Beach before traveling through rural agricultural areas to the City of Watsonville. The closest sensitive receptors to the Watsonville reach include a residential community, adjacent to La Selva State Beach, approximately 50 feet east of segment 15, as well as

¹ Normally Acceptable – Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements.



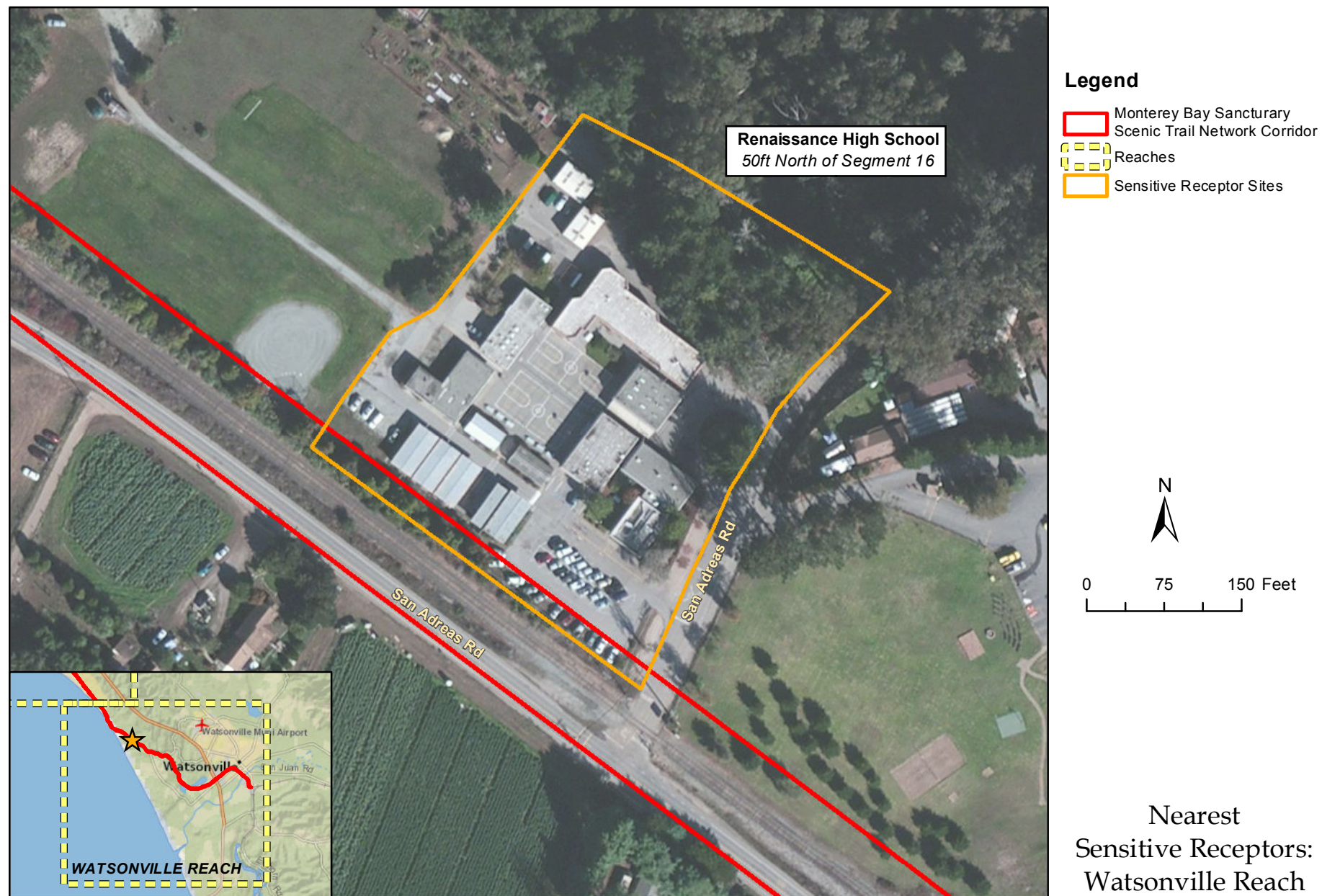
Basemap Sources: Microsoft Corporation, 2012, National Geographic, 2012,
 Additional data provided by RRM Design Group, 2012.

Figure 4.10-1a



Basemap Sources: Microsoft Corporation, 2012, National Geographic, 2012,
 Additional data provided by RRM Design Group, 2012.

Figure 4.10-1b



Basemap Sources: Microsoft Corporation, 2012, National Geographic, 2012,
Additional data provided by RRM Design Group, 2012.

Figure 4.10-1c

Renaissance High School, which is located approximately 50 feet east of segment 16. Figure 4.10-1c illustrates the location of one of the nearest sensitive receptors (Renaissance High School) in relation to the Watsonville reach. Other nearby sensitive receptors include scattered residences near segments 16 and 20, which would be located between 100 and 300 feet from the proposed alignment.

c. Existing Noise Levels. The ambient noise environment in the project area is defined by agricultural operations, railroad operations, traffic on roadways near the MBSST Network project area, and existing commercial and industrial operations adjacent to the proposed MBSST Network.

Agricultural Operations. As discussed in Section 4.2, *Agricultural Resources*, the northern and Watsonville reaches of the MBSST Network would be located adjacent to active agricultural land. Some of the more common noise sources associated with farming operations include tractors, harvesting equipment, spray equipment, aerial crop-dusters, and stationary power sources, including internal combustion pump engines. Maximum noise levels generated by farm-related tractors typically range from 77 to 85 dB at a distance of 50 feet from the tractor, depending on the horsepower of the tractor and the operating conditions. Due to the seasonal nature of the agricultural industry, there are often extended periods of time when no noise is generated on properties that are actively being farmed, followed by short-term periods of intensive mechanical equipment usage and corresponding noise generation. Due to this high degree of variability of agricultural activities, it is not feasible to reliably quantify the noise generation of agricultural uses in terms of the daily or hourly noise standards commonly utilized to assess impacts of other noise sources. However, these uses may generate short-term periods of elevated noise during all hours of the day and night.

Agricultural uses within Santa Cruz County are protected by the County's Municipal Code (Chapter 16.50, Agricultural Land Preservation and Protection Ordinance). The Ordinance is intended to support and encourage continued agricultural operations in the County and to forewarn prospective purchasers and residents of property adjacent to agricultural operations of the necessary sounds, odors, dust and hazardous chemicals that accompany agricultural operations. As stated in the ordinance, "no agricultural activity, operation, or facility or appurtenances thereof shall be or become a nuisance, public or private, if it has been conducted and maintained for commercial purposes, and in a manner consistent with proper and accepted customs and standards as established and followed by similar agricultural operations, and in a manner consistent with all applicable Federal, State and local laws, regulations, permits and approvals, and the conditions thereof, after it has been in operation for more than three years if it was not a nuisance when it began" [§ 16.50.010(C)]. Therefore, normal and usual agricultural operations creating elevated sound levels are not normally considered a nuisance.

Railroad Operations. The MBSST Network corridor would primarily align with the Santa Cruz Branch Rail Line right-of-way; a 32-mile, continuous travel corridor, 31-miles of which is now owned by the RTC. The 136-year old Santa Cruz Branch Rail Line corridor parallels Highway 1, extending almost 32 miles from the town of Pajaro in Monterey County to Davenport in Santa Cruz County. The right-of-way is generally 50 to 60 feet wide with numerous existing bridges and trestles, including major crossings of the Pajaro River, Highway 1, Soquel Creek, the Santa Cruz Yacht Harbor, and the San Lorenzo River. Iowa Pacific Holdings, operating as Santa Cruz and

Monterey Bay Railway, is the freight operator and will implement freight, passenger, and recreational rail service. Currently, there is no daily freight service on the rail line outside of the Watsonville/Pajaro area. There is a seasonal passenger rail service that operates between the City of Santa Cruz ~~and to~~ the northern reach, south of Davenport and the City of Watsonville to east of Manresa State Beach. This seasonal service operates two to four passenger trains per day, with a higher number of trips on weekends. Within the Watsonville/Pajaro area, there are freight trips every weekday, and weekends as needed. These trips are localized and do not extend outside of the Watsonville/Pajaro area. The rail line in Watsonville is used to transport perishables (including raspberries, strawberries, and other agricultural products), lumber and biofuels. These trips are localized and do not extend outside of Watsonville. The rail line in Watsonville is used to transport frozen perishables (including raspberries, strawberries, and other agricultural products) and lumber. There is currently no rail operation between Watsonville and Santa Cruz, except when needs arise for a special movement of equipment.

The interaction of steel wheels and rails generates three types of noise: (1) rolling noise due to continuous rolling contact, (2) impact noise when a wheel encounters a discontinuity in the running surface, such as a rail joint, turnout or crossover, and (3) squeal generated by friction on tight curves. As speed increases, wheel-rail noise becomes the dominant noise source (over lower frequency rolling noise) (FTA, May 2006). Railroad noise exposure levels depend upon train operating conditions, distance from the tracks, train speed, and the characteristics of the track. Railroad operations along the MBSST Network are currently limited to seasonal passenger rail service that operates between the City of Santa Cruz and the northern reach south of Davenport and the City of Watsonville to east of Manresa State Beach as well as ~~and~~ weekday freight trips in the Watsonville/Pajaro area.

Roadway Noise. The proposed MBSST Network trail alignment would run adjacent to busy roadways in several locations (including Highway 1), and would also intersect public roadways at 84 locations. Noise associated with the proximity of each reach to public roadways is described below.

Northern Reach. The northern reach of the MBSST Network begins at the San Mateo/Santa Cruz county line on Highway 1, just north of the Waddell Bluffs, and continues south to the northern Santa Cruz city limits near Schaffer Road (refer to Figure 2-5 in Section 2.0, *Project Description*). The northern reach would cross roadways at approximately 20 locations, including Highway 1, Shaffer Road, and Scaroni Road.

The railroad corridor parallels the coastal side of Highway 1 from Davenport to the south. Except for one highway crossing in Davenport, the railroad's offset from Highway 1 varies from 50 feet to 1,320 feet. Because of its proximity to the MBSST Network project corridor, Highway 1 is the most significant source of roadway noise that would be experienced by future trail users along the segments of the northern reach. Highway noise is related to such factors as vehicle speed, traffic volume, degree of exhaust muffling, roadway condition, and composition of roadway traffic.

Central Reach. Beginning at the City of Santa Cruz northern city boundary near Schaffer Road and extending southeast to Seascapes Park just south of Aptos, this reach of the MBSST corridor traverses through densely populated coastal urban areas (refer to Figure 2-7 in Section 2.0, *Project Description*). The central reach would cross numerous public and private roadways.

Additionally, the central reach would primarily diverge from Highway 1 until segment 11, where the proposed alignment would again come within 350 feet of the highway near New Brighton State Beach. The central reach would parallel the following streets for approximately $\frac{1}{4}$ of a mile to one mile: Bay Street, Beach Street, Murray Street, Cliff Drive, Park Avenue, Soquel Drive, and Sumner Avenue. Unlike the majority of the aforementioned roadways and Highway 1, Murray Street is directly adjacent to segments of the proposed central reach, contains no structural barriers and contains no landscaped or vegetative barriers that would attenuate noise. Therefore, in addition to Highway 1, Murray Street would be a significant source of roadway noise experienced by future trail users along the central reach.

Watsonville Reach. The Watsonville reach of the MBSST Network begins at the railroad mile marker 10 near Seascapes Village Park and ends at Railroad Avenue in Monterey County (refer to Figure 2-9 in Section 2.0, *Project Description*). This reach parallels the coastal edge for approximately one mile before it begins following the San Andreas Road alignment inland as it heads south and east. In addition, on street improvements (Class II, Class III and sidewalks) are proposed for Beach Street. The Watsonville reach would cross a number of public and private roadways. The Watsonville reach would run parallel to the San Andreas Road for over one mile and Walker Street for approximately $\frac{1}{2}$ mile. As the San Andreas Road alignment is the roadway segment that would run parallel to the Watsonville reach for the longest period of time, San Andreas Road would be the most significant source of roadway noise experienced by future trail users.

Commercial and Industrial Land Uses. Commercial and industrial land uses are located primarily in the central and Watsonville reaches.

Central Reach. Segments of the central reach would expose future trail users to noise resulting from existing commercial and industrial land uses. The proposed MBSST Network passes by industrial areas in segment 7 of the central reach, where the trail enters the City of Santa Cruz. Industrial uses along segment 7 include construction and auto storage. Segment 7 would also pass by the Santa Cruz Wastewater Treatment Facility, located near Neary Lagoon Park. The central reach passes through commercial areas in Santa Cruz, Live Oak, Capitola, and Aptos. These areas include a wide variety of commercial uses, including retail, office, and automotive services.

Watsonville Reach. Segments of the Watsonville reach would expose future trail users to noise resulting from existing commercial and industrial operations. The proposed MBSST Network passes by industrial areas in segments 18 through 20 of the Watsonville reach. Industrial uses along segments 18 through 20 include lumber, construction, and building materials sales and storage; metal fabrication; greenwaste recovery; and automotive repair.

d. Regulatory Setting.

State. As required by Section 65302 of the Government Code of California, desirable noise levels are embodied within the Noise Element of General Plans. Division 28 of the California Health and Safety Code requires that the State Office of Noise Control within the Department of Health Services develop model elements and model noise ordinances for consideration by local jurisdictions in developing noise standards. The objective of noise

standards is to provide the community with a means of judging the noise environment that it deems to be generally acceptable. The State has also adopted guidelines for land use compatibility and community noise environment, which are shown in Table 4.10-1.

**Table 4.10-1
Land Use Compatibility for Noise Environments**

Land Use Category	Community Noise Exposure Level (dBA)			
	Normally Acceptable	Conditionally Acceptable	Normally Unacceptable	Clearly Unacceptable
Residential - Low Density, Single-Family, Duplex, Mobile Homes	50-60	55-70	70-75	75-85
Residential – Multiple Family	50-65	60-70	70-75	75-85
Transient Lodging – Motel, Hotels	50-65	60-70	70-80	80-85
Schools, Libraries, Churches, Hospitals, Nursing Homes	50-70	60-70	70-80	80-85
Auditoriums, Concert Halls, Amphitheaters	NA	50-70	NA	N/A
Sports Arenas, Outdoor Spectator Sports	NA	50-75	NA	N/A
Playgrounds, Neighborhood Parks	50-70	NA	67.5-75	72.5-85
Golf Courses, Riding Stable, Water Recreation, Cemeteries	50-75	NA	70-80	80-85
Office Buildings, Business Commercial and Professional	50-70	67.5-77.5	75-85	NA
Industrial, Manufacturing, Utilities, Agriculture	50-75	70-80	75-85	NA

Source: State of California Governor's Office of Planning and Research, General Plan Guidelines, 2003

Notes: NA - Not Applicable

Normally Acceptable – Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements

Conditionally Acceptable – New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features included in the design. Conventional construction, but with closed windows and fresh air supply systems or air conditioning will normally suffice.

Normally Unacceptable – New construction or development should be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design.

Clearly Unacceptable – New construction or development should generally not be undertaken.

Santa Cruz County.

Santa Cruz County General Plan and Local Coastal Program. According to the Santa Cruz County General Plan Public Safety and Noise Element, noise sensitive land uses include residential (residences, hotels, and motels), institutional (schools, libraries, museums, hospitals, personal care, meeting halls, and churches), and office (office buildings, business commercial, and professional) uses. The recommended exterior noise limit for all noise-sensitive land uses is 60 dB Ldn (or CNEL) and the recommended maximum interior noise level is 45 dB Ldn (or CNEL). The Public Safety and Noise Element also includes goals and policies to regulate noise



sources. In addition, the Circulation Element of the County's General Plan and Local Coastal Program includes Policy 3.7.2, which regulates noise from rail facilities. The goals and policies applicable to this project are discussed below.

Policy 6.9.6 *Evaluate vibrations from rail activities for future development within 200 feet of the railroad tracks as part of environmental review.*

Policy 6.9.7 *Require mitigation of construction noise as a condition of future project approvals.*

Policy 6.10.1 *Require environmental review of all proposed transportation projects which may increase the average day/night noise levels including any increased or new uses of the Southern Pacific Railroad right-of-way.*

Policy 3.7.2 *Require the design of new development near existing rail lines minimize the impact of existing and potential rail system noise and maximize setbacks for new development.*

Santa Cruz County Municipal Code. Chapter 8.30 (Noise) of the Santa Cruz County Municipal Code establishes noise regulations within Santa Cruz County. Section 8.30.010 of the County's Municipal Code states that "offensive noise²" shall not be permitted between the hours of 10:00 PM and 8:00 AM.

City of Santa Cruz.

City of Santa Cruz General Plan 2030. The Hazards, Safety, and Noise chapter of the City of Santa Cruz General Plan establishes different noise standards for different land use categories. For residential (low density single family, duplex, and mobile homes), the recommended exterior noise standard is 60 dB Ldn (or CNEL). For multi-family residential uses and transient lodging (motels and hotels), the exterior noise standard is 65 dB Ldn (or CNEL). For institutional uses (schools, libraries, churches, hospitals, and nursing homes), the exterior noise standard is 70 dB Ldn (or CNEL). The General Plan additionally requires that interior noise in all new multi-family housing not exceed 45 dB Ldn with the windows and doors closed. The Hazards, Safety, and Noise chapter of the General Plan also includes several goals, policies, and actions related to noise, established to guide development within the City. The goals and policies applicable to this project are discussed below.

Goal HZ3 *Noise levels compatible with occupancy and use.*

Policy HZ3.1 *Maintain or reduce existing noise levels and control excessive noise.*

Action HZ3.1.1 *Require land uses to operate at noise levels that do not significantly increase surrounding ambient noise.*

² "Offensive noise" is defined as any noise which is loud, boisterous, irritating, penetrating, or unusual, or that is unreasonably distracting in any other manner such that it is likely to disturb people of ordinary sensitivities in the vicinity of such noise, and includes, but is not limited to, noise made by an individual alone or by a group of people engaged in any business, meeting, gathering, game, dance, or amusement, or by any appliance, contrivance, device, structure, construction, ride, machine, implement, instrument or vehicle [Santa Cruz County Municipal code, Section 8.30.010 (B)].

Action HZ3.1.2 Use site planning and design approaches to minimize noise impacts from new development on surrounding land uses.

Action HZ3.1.3 Ensure that construction activities are managed to minimize overall noise impacts on surrounding land uses.

Policy HZ3.2 Ensure that noise standards are met in the siting of noise-sensitive uses.

City of Santa Cruz Municipal Code. Chapter 9.36 (Noise) of the City of Santa Cruz Municipal Code regulates “offensive noise³” within the City of Santa Cruz. Section 9.36.10 states that offensive noise shall not be permitted between the hours of 10:00 PM and 8:00 AM. Section 9.36.10(e) exempts certain construction projects from these time limits, pursuant to determination by the chief building official, public works director, planning and community development director or water department director.

City of Capitola.

City of Capitola General Plan. The Capitola General Plan is currently being updated, and a Public Review Draft General Plan is anticipated for June 2013. The current General Plan was adopted in 1989. The Noise Element of the existing Capitola General Plan establishes goals and policies for the regulation of noise in the City, and establishes different noise standards for different land use categories, consistent with those established in the City of Santa Cruz (60 dB Ldn or CNEL for single-family residential uses, 65 dB Ldn CNEL for multi-family residential and transient lodging, and 70 dB Ldn or CNEL for institutional uses). The General Plan additionally requires that habitable rooms in all residential developments maintain a maximum interior noise standard of 45 dB Ldn (or CNEL).

Capitola Municipal Code. The City of Capitola Municipal Code regulates noise through the Noise Ordinance (Chapter 9.12). Section 9.12.010 (B) of the Noise Ordinance states that construction noise shall be prohibited between the hours of 9:00 PM and 7:30 AM on weekdays, and shall be prohibited on weekends with the exception of Saturday work between 9:00 AM and 4:00 PM.

City of Watsonville.

City of Watsonville General Plan. An updated City of Watsonville General Plan was adopted by the City Council in January 2013, but was subsequently challenged in court and is on hold until resolution on the legal issues can be reached. Therefore, at this time, the 2005 General Plan remains in effect..

The existing 2005 General Plan, adopted in 1994, addresses noise through the Public Safety Element. The Public Safety Element establishes noise standards for different land use categories,

³ “Offensive noise” means any noise which is loud, boisterous, irritating, penetrating, or unusual, or that is unreasonably distracting in any other manner, such that it is likely to disturb people in the vicinity of such noise, and includes, but is not limited to, noise made by barking or howling dogs, by an individual alone or by a group of people engaged in any business meeting, gathering, game, dance, or amusement, or by any appliance, contrivance, device, structure, construction, ride, machine, implement, or instrument.

consistent with the cities of Santa Cruz and Capitola (60 dB Ldn or CNEL for single-family residential uses, 65 dB Ldn CNEL for multi-family residential and transient lodging, and 70 dB Ldn or CNEL for institutional uses). The goal applicable to this project is discussed below.

Goal 12.8 *Evaluate new and existing land uses in the City for compatibility related to noise effects and require, as appropriate, mitigation where harmful effects can be identified and measurable improvement will result.*

Watsonville Municipal Code. Title 5, Chapter 8 (Noise) of the City's Municipal Code sets standards for the regulation of noise in the City. Section 5-8.02 prohibits offensive noise between the hours of 10:00 PM and 7:00 AM.

Monterey County. Segment 20 of the proposed MBSST Network project, which is 0.74 miles long, would be located in Monterey County. The purpose of this segment is to provide a regional connection to the Monterey County section of the Monterey Bay Sanctuary Scenic Trail. Implementation of this section would require cooperation and coordination with the Transportation Agency for Monterey County (TAMC) and the County of Monterey. Monterey County General Plan goals and policies, as well as Monterey County Municipal Code regulations, would apply to this segment.

4.10.2 Impact Analysis

a. Methodology and Significance Thresholds. The analysis of noise impacts considers the effects of both temporary construction-related noise and long-term noise associated with operation of the proposed MBSST Network. Construction noise was estimated based on noise level estimates from the Federal Transit Administration's (FTA) Transit Noise and Vibration Impact Assessment (May 2006). Long-term traffic-related noise was estimated based on the estimated number of vehicle trips generated by the proposed MBSST Network project. With regard to noise-sensitive uses adjacent to the trail corridor, the County of Santa Cruz and cities of Santa Cruz, Capitola, and Watsonville establish different noise thresholds, as follows:

- *County of Santa Cruz*. 60 dB Ldn (or CNEL) for all noise-sensitive land uses (including residential, institutional, and office uses).
- *Cities of Santa Cruz, Capitola, and Watsonville*. 60 dB Ldn (or CNEL) for residential uses (low density single family, duplex, and mobile homes), 65 dB Ldn (or CNEL) for multi-family residential and transient lodging (motels and hotels), and 70 dB Ldn (or CNEL) for institutional uses (schools, libraries, churches, hospitals, and nursing homes)

For consistency and as a worst case scenario, the County threshold of 60 dB Ldn (or CNEL) for all noise-sensitive land uses is used in this analysis.

As described in Section 4.10.1(b) (Sensitive Receptors), the proposed MBSST Network itself would not be classified as a noise-sensitive land use.

Pursuant to Appendix G of the *CEQA Guidelines*, potentially significant impacts would occur if the proposed MBSST Network project would result in any of the following conditions:

- 1) *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;*
- 2) *Exposure of persons to or generation of excessive ground-borne vibration or ground-borne noise levels;*
- 3) *A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project; and/or*
- 4) *A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.*

It should be noted that the proposed MBSST Network would be located outside of any airport noise impact contours and does not involve the construction of residences or office buildings, and would therefore not expose residents or workers to excessive noise levels from airport or private air strip operations. As a result, the checklist items related to these conditions were excluded from the above list and further discussion can be found in the Initial Study (Appendix A of this document).

b. Project Impacts and Mitigation Measures.

Impact N-1 **Construction of the proposed MBSST Network would create temporary noise level increases that could disturb nearby sensitive receptors. This is a Class II, significant but mitigable impact.**

The operation of heavy equipment during construction of the proposed MBSST Network trail alignment would result in temporary increases in noise in the immediate vicinity. As illustrated in Table 4.10-2, average noise levels associated with the use of heavy equipment at construction sites can range from about 76 to 89 dBA at 50 feet from the source, depending upon the types of equipment in operation at any given time and the phase of construction. The grading phase of construction tends to create the highest noise levels because of the operation of heavy equipment. Noise levels from point sources such as construction sites typically attenuate at a rate of about 6 dBA per doubling of distance. Therefore, only areas within a few hundred feet of construction sites would be expected to be exposed to unacceptable noise levels.

**Table 4.10-2
Typical Construction Noise Levels (dBA)**

Equipment	Typical Level 50 Feet from the Source	Typical Level 100 Feet from the Source	Typical Level 200 Feet from the Source	Typical Level 300 Feet from the Source
Air Compressor	81	75	69	66
Backhoe	80	74	68	65
Concrete Mixer	85	79	73	70
Grader	85	79	73	70
Paver	89	83	77	74
Saw	76	70	64	61
Scraper	89	83	77	74
Truck	88	82	76	73

Source: Typical noise level 50 feet from the source was taken from FTA, May 2006. Noise levels at 100 feet, 200 feet, and 300 feet were extrapolated using a 6 dBA attenuation rate for the doubling of distance.

It should be noted that vibratory and/or impact pile-driving activities can result in noise levels in excess of those shown in Table 4.10-2. However, project construction activities would not require pile-driving.

Northern Reach. The nearest sensitive receptors to the northern reach include residences approximately 150 feet north of segment 4, as shown in Figure 4.10-1a. For the purpose of this analysis, the nearest receptor is used as a worst case scenario. Based on the construction noise levels presented in Table 4.10-2, these nearby residences would experience construction noise levels as high as 80 dBA during operation of the loudest construction equipment. This noise level, although temporary, would exceed the established threshold of 60 dBA Ldn (or CNEL).

Throughout the length of the northern reach, construction noise would attenuate to the exterior noise threshold of 60 dBA at a distance of approximately 1,500 feet from the source of noise. Any noise-sensitive land uses within 1,500 feet of the trail could therefore be exposed to noise levels above the 60 dBA threshold during construction. It should be noted, however, that this analysis does not account for intervening structures, topography, or vegetation, which may reduce noise levels at sensitive receptors located within 1,500 feet of the trail. However, given the proximity of sensitive uses to the northern reach [including residences and institutional (school) uses], numerous receptors may be exposed to noise levels exceeding thresholds.

Central Reach. The closest sensitive receptors to the central reach include residential communities, with existing residences as close as 50 feet from the corridor, as shown in Figure 4.10-1b. For the purpose of this analysis, the nearest receptor is used as a worst case scenario. Based on the construction noise levels presented in Table 4.10-2, these receptors would experience construction noise levels as high as 89 dBA during operation of the loudest construction equipment. This noise level, although temporary, would exceed the established threshold of 60 dBA Ldn (or CNEL).

Throughout the length of the central reach, construction noise would attenuate to the threshold of 60 dBA at a distance of approximately 1,500 feet from the source. Any noise-sensitive land uses within 1,500 feet of the trail could therefore be exposed to noise levels above the 60 dBA threshold during construction. It should be noted, however, that this analysis does not account for intervening structures, topography, or vegetation, which may reduce noise levels at sensitive receptors located within 1,500 feet of the trail. However, given the proximity of sensitive uses to the central reach (including residential, institutional, and office uses), numerous receptors may be exposed to noise levels exceeding thresholds.

Watsonville Reach. The closest sensitive receptor to the Watsonville reach includes Renaissance High School, which is located approximately 50 feet east of segment 16 (refer to Figure 4.10-1c). For the purpose of this analysis, the nearest receptor is used as a worst case scenario. Based on the construction noise levels presented in Table 4.10-2, this receptor would experience noise levels as high as 89 dBA during operation of the loudest construction equipment. This noise level, although temporary, would exceed the established threshold of 60 dBA Ldn (or CNEL).

Throughout the length of the Watsonville reach, construction noise would attenuate to the exterior noise threshold of 60 dBA at a distance of approximately 1,500 feet from the source of noise. Any noise-sensitive land uses within 1,500 feet of the trail could therefore be exposed to noise levels above the 60 dBA threshold during construction. It should be noted, however, that this analysis does not account for intervening structures, topography, or vegetation, which may reduce noise levels at sensitive receptors located within 1,500 feet of the trail. However, given the proximity of sensitive uses to the Watsonville reach [including residences and institutional uses (schools and churches)], numerous receptors may be exposed to noise levels exceeding thresholds.

Mitigating Design Features. As discussed in Section 4.10.1(d) (Regulatory Setting), the Santa Cruz County Municipal Code prohibits offensive noise (including construction) between the hours of 10:00 PM and 8:00 AM. The City of Santa Cruz prohibits offensive noise between the hours of 10:00 PM and 8:00 AM, but exempts certain construction projects from these time limits. The City of Capitola prohibits offensive noise between the hours of 9:00 PM and 7:30 AM on weekdays and on weekends except for Saturday work between 9:00 AM and 4:00 PM. The City of Watsonville prohibits offensive noise between the hours of 10:00 PM and 7:00 AM.

The prohibition of offensive noise during nighttime hours would limit the effects of nighttime construction noise, thereby reducing impacts to residential land uses during the hours people are typically in their homes or normally sleep. However, construction activities may be exempt from these noise ordinance restrictions in some instances, such that construction may take place at night. In addition, daytime noise would still exceed the established threshold of 60 dB Ldn (or CNEL) at other noise-sensitive receptors (including institutional and office uses) along all three reaches. Therefore, impacts are potentially significant and mitigation is required.

Mitigation Measures. The following mitigation measures are required to reduce construction-related noise impacts:

- N-1(a) Construction Hours.** Hours of construction for all segments of the MBSST Network project shall be limited to the hours between 8:00 AM and 7:00 PM on weekdays and 9:00 AM to 4:00 PM on Saturdays.
- N-1(b) Acoustical Shelters.** Air compressors and generators used for construction shall be surrounded by temporary acoustical shelters if within 1,500 feet of a sensitive receptor (including residential, institutional, and office land uses).
- N-1(c) Construction Equipment.** Stationary construction equipment that generates noise that exceeds 60 dBA at the boundaries of adjacent sensitive receptors shall be baffled to reduce noise and vibration levels. All construction equipment powered by internal combustion engines shall be properly muffled and maintained. Unnecessary idling of internal combustion engines shall be prohibited. Whenever feasible, electrical power shall be used to run air compressors and similar power tools.

Significance After Mitigation. Construction related noise effects would be temporary. In addition, with implementation of the above mitigation measures, noise generated by construction equipment would be limited to daytime hours and would be muffled to the extent practicable. As a result, impacts would be reduced to a less than significant level.

Impact N-2 **Operational use of the proposed MBSST Network would create intermittent noise. However, this noise is not expected to result in a measurable increase in ambient noise levels. Impacts would therefore be Class III, less than significant.**

Operational noise along the proposed MBSST Network would include the sound of trail users talking, maintenance workers collecting garbage or maintaining landscapes, dogs barking, and noises associated with equestrian uses (where allowed in the northern reach). These new noise sources would be intermittent, but would contribute incrementally to the ambient noise levels in the MBSST Network project vicinity. The existing noise environment in the project vicinity includes agricultural operations, existing railroad operations, and roadway noise from Highway 1 as well as other roadways in the project vicinity. The intermittent and incremental noise caused by pedestrians, bicyclists, and equestrians as well as maintenance activities would not be expected to generate a measurable increase in ambient noise levels compared to existing conditions. Therefore, the MBSST Network project would not expose nearby sensitive receptors to noise levels above accepted standards during project operations.

Mitigation Measures. No mitigation is required.

Significance After Mitigation. Impacts would be less than significant without mitigation.

Impact N-3 **The proposed MBSST Network would incrementally increase traffic in the vicinity of trail staging areas. However, this additional traffic would be minimal, and would not increase ambient noise levels. This is a Class III, less than significant impact.**

The proposed MBSST Network would generate a small increase in local traffic in the vicinity of trail staging areas by encouraging pedestrians, bicyclists, equestrians, and other trail users to visit the trail via staging areas. The roadways anticipated to experience the greatest traffic level increases would be the roadways from which the existing 22 trail access and staging areas are accessible, as well as the 84 roadway locations that intersect the trail. As indicated in Section 4.11, *Transportation/Traffic*, the proposed MBSST Network would generate a net increase of approximately 1,215 average daily vehicle trips (ADT), distributed evenly across the 22 trail access and staging areas. This level of trip generation would not be perceptible, nor create operational impacts on adjacent roadways.

It should also be noted that the proportion of these trips that can be characterized as “new” is uncertain. Traffic associated with recreational projects may be relocated trips from other locales, and consequently, may result in either higher or lower net vehicle miles traveled (VMT). For the proposed MBSST Network, it is likely that some of the ADTs would be truly “new” vehicle trips. However, it is also likely that some of the ADTs represent diversion of existing

recreational-focused trips from other locations. Thus, although some increase in ADT would be associated with the proposed MBSST Network, it is not possible to discern how much diversion is occurring or what fraction of those average daily trips represents regional increases. Based on the minor increase in ADT throughout the region, and the fact that many of the trips may be relocated from other destinations (rather than newly generated trips), the contribution of the MBSST Network project to traffic-generated noise impacts would be less than significant.

Mitigation Measures. No mitigation is required.

Significance After Mitigation. Impacts would be less than significant without mitigation.

Impact N-4	Users of the proposed MBSST Network may temporarily be exposed to noise near busy roadways, agricultural operations, and active rail segments. However, the trail is not considered a sensitive land use, and exposure would be intermittent. This is a Class III, less than significant impact.
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The proposed MBSST Network project would experience noise resulting from vehicular traffic along roadways adjacent to the proposed corridor, existing agricultural operations, existing industrial and commercial operations, and railroad noise. Potential noise impacts associated with roadways, agricultural operations, commercial and industrial operations, and active rail segments along each reach are discussed below.

Northern Reach. Noise sources along the northern reach include roadways, railroad operations, and agriculture. The northern reach would cross roadways at approximately 20 locations. The most heavily travelled roadway near the northern reach is Highway 1, which has approximately 8,800 annual average daily trips (AADT) in the vicinity of the northern reach (California Department of Transportation, December 2012). The northern portion of the northern reach (segments 1 and 2) would be located on or immediately adjacent to Highway 1, as the trail would consist of a Class III on-street/road shoulder bike route, much of which is currently in place. Future trail users would experience the highest levels of roadway noise while traveling along these segments. Beginning in segment 3, the northern reach would include a new multi-use paved path adjacent to the existing trail line. Except for the crossing in Davenport, the trial corridor's offset from Highway 1 varies from 100 feet to 1,300 feet between Schaffer Road and Scaroni Road. The corridor then parallels Highway 1 at a distance of 50 to 100 feet as the coastal bluffs steepen and narrow toward Davenport. In this vicinity, roadway noise would be lower, and would attenuate as future trail users move along the reach.

Noise exposure resulting from railroad operations would be infrequent. In the vicinity of the northern reach, existing rail operation is currently limited to a seasonal passenger service that travels between the City of Santa Cruz and up coast towards Davenport (near Scaroni Road). This seasonal service operates two to four passenger trains per day, with a higher number of trips on weekends. During most of the year, there are no train trips currently in the northern reach. Therefore, the seasonality and infrequency of the passenger rail service would not be anticipated to result in adverse noise impacts to future trail users.

Agricultural operations would also be a source of noise along the southern half of the northern reach (approximately segments 3 through 5). Typically, agricultural operations involve mobile sources of noise; therefore, trail users would not be exposed to high noise levels for extended periods of time. It is also expected that trail users would be mobile and would eventually travel away from this source of noise. Agricultural operations are seasonal by nature and would only occur along the northern reach intermittently. While trail users may experience temporary increases in noise levels due to adjacent agricultural operations, such noise sources would be consistent with the existing ambient noise environment.

Based on the above discussions, existing noise sources along the northern reach would not substantially affect trail users along these segments of the proposed trail. In addition, because active recreational uses (like the MBSST Network) are not classified as a noise-sensitive land use, impacts would be less than significant.

Central Reach. Existing noise in the vicinity of the central reach result from roadways, existing commercial and industrial land uses, and railroad operations. The most heavily travelled roadway near the central reach is Highway 1. The central reach would come within approximately 350 feet of the highway near Swift Street in the western portion of the City of Santa Cruz and near New Brighton State Beach. At a distance of 350 feet, Highway 1 would not be anticipated to generate a significant source of roadway noise for future trail users along the central reach. The central reach would travel adjacent to several surface streets for approximately $\frac{1}{4}$ of a mile to one mile, including: Bay Street, Beach Street, Murray Street, Cliff Drive, Park Avenue, Soquel Drive, and Sumner Avenue. Because the trail would be adjacent to these roads, they would serve as a more sustained source of roadway noise than Highway 1. In addition, the central reach would cross numerous other public and private roadways. These roadways are less heavily traveled than Highway 1, and would not parallel the central reach. As such, future trail users would only experience noise from these roadways while at individual roadway crossings; thus, trail users would be expected to immediately move away from these roadways as they utilize the trail.

Portions of the central reach would also be exposed to noise resulting from existing commercial and industrial operations. However, as future trail users would be mobile, noise levels resulting from such uses would attenuate as trail users move away from these sources.

As previously mentioned, noise exposure resulting from railroad operations would be infrequent. Operations along the central reach are limited to a seasonal passenger service that travels between the City of Santa Cruz and the northern reach (thus only affecting segments 7 through 9). This seasonal service operates two to four passenger trains per day, with a higher number of trips on weekends. This seasonal service would only impact three segments of the central reach during part of the year. There is no daily or seasonal rail operation near segments 10 through 14. The seasonality and infrequency of trial operations in the central reach would not be anticipated to result in adverse noise impacts to future trail users.

Based on the above discussions, existing noise sources along the central reach would not substantially affect trail users along these segments of the proposed trail. In addition, because active recreational uses (like the MBSST Network) are not classified as a noise-sensitive land use, impacts would be less than significant.

Watsonville Reach. Existing noise levels along the Watsonville reach result from roadway noise, existing commercial and industrial operations, railroad operations, and agricultural operations. The Watsonville reach would run parallel to San Andreas Road for over one mile and Walker Street for approximately ½ mile. The Watsonville reach would also cross other roadways at 13 locations, the fewest roadways of the three proposed reaches. These roadways would not parallel the Watsonville reach and future trail users would only experience this source of noise while at individual roadway crossings; thus, it would be expected that trail users would almost immediately move away from these roadway crossings as they utilize the trail.

Portions of the Watsonville reach would be exposed to noise resulting from existing commercial and industrial operations. However, as future trail users would be mobile, noise levels resulting from existing commercial and industrial operations would attenuate as trail users move away from these sources.

As previously mentioned, noise exposure resulting from railroad operations would be infrequent. Within the City of Watsonville (segments 18 and 19), there are freight trips every weekday. These trips are localized and do not extend outside of the Watsonville/Pajaro area. Thus, there is no daily rail service along segments 15 through 17 or segment 20. The speed limit for the freight train in Watsonville is only 10 miles per hour (RTC, December 2009). Wheel-rail noise becomes the dominant noise source (over lower frequency rolling noise) as speed increases (FTA, May 2006). Thus, the infrequency and slow speed of the freight train along segments 18 and 19 would not be anticipated to result in adverse noise impacts to future trail users.

Agricultural operations would also be a source of noise along the northern portion of the Watsonville reach (approximately segments 16 and 17). Typically, agricultural operations involve mobile sources of noise; therefore, trail users would not be exposed to high noise levels for extended periods of time. It is also expected that trail users would be mobile and would eventually travel away from this source of noise. Agricultural operations are seasonal by nature and would only occur along the Watsonville reach intermittently. While trail users may experience temporary increases in noise levels due to adjacent agricultural operations, such noise sources would be consistent with the existing ambient noise environment.

Based on the above discussions, existing noise sources along the Watsonville reach would not substantially impact trail users along these segments of the proposed trail. In addition, because active recreational uses (like the MBSST Network) are not classified as a noise-sensitive land use, impacts would be less than significant.

Mitigation Measures. No mitigation is required.

Significance After Mitigation. Impacts would be less than significant without mitigation.

c. Cumulative Impacts. Additional development resulting from buildout of Santa Cruz County and the cities of Santa Cruz, Capitola, and Watsonville would gradually alter the scale of existing development and incrementally increase regional noise levels. As discussed above, individual operational noise-related impacts associated with the proposed MBSST Network project would be less than significant. The proposed MBSST Network project would not constitute a new stationary source of noise, and operation of the trail would result in minimal

and incremental noise from trail users (including talking and dogs barking) and maintenance workers (from garbage collection and landscape maintenance). In addition, although the proposed MBSST Network project would incrementally increase traffic near trail staging areas, these local trips would be balanced by a reduction in trips elsewhere, and by providing an active (non-vehicle) transportation option. Thus, the project would not contribute to a cumulative increase in traffic-related noise across the County. Overall, the proposed project would not result in a significant contribution to cumulative noise levels in the area. Cumulative noise impacts would therefore be less than significant.