3.5 NOISE

INTRODUCTION

This section describes noise and noise sources in the SCAG region, identifies potential noise impacts of the RTP, includes mitigation measures for the impacts, and evaluates the residual impacts.

ENVIRONMENTAL SETTING

The environmental setting describes noise and noise sources associated with the RTP. It also describes the regulatory setting that governs noise.

Noise Descriptors

Sound waves, traveling outward from a source, exert a sound pressure level (commonly called "sound level"), measured in decibels (dB). "Noise" is often defined as unwanted sound, and environmental noise is usually measured in "A-weighted" decibels, which is a decibel corrected for the variation in frequency response of the typical human ear at commonly-encountered noise levels. All noise levels discussed herein reflect A-weighted decibels. In general, people can perceive a two- to three-dB difference in noise levels; a difference of 10 dB is perceived as a doubling of loudness.

Environmental noise levels typically fluctuate across time of day; different types of noise descriptors are used to account for this variability, and different types of descriptors have been developed to differentiate between cumulative noise over a given period and single noise events. Cumulative noise descriptors include the energy-equivalent noise level (L_{eq}), Day-Night Average Noise Level (DNL), and Community Noise Equivalent Level (CNEL). The L_{eq} is the actual time-averaged, equivalent steady-state sound level, which, in a stated period, contains the same acoustic energy as the time-varying sound level during the same period. DNL and CNEL values result from the averaging of L_{eq} values (based on A-weighted decibels) over a 24-hour period, with weighting factors applied to different periods of the day and night to account for their perceived relative annoyance. For DNL, noise that occurs during the nighttime period (10:00 p.m. to 7:00 a.m.) is "penalized" by 10 dB. CNEL is similar to DNL, except that it also includes a "penalty" of approximately 5 dB for noise that occurs during the evening period (7:00 p.m. to 10:00 p.m.). Cumulative noise descriptors, DNL and CNEL, are well correlated with public annoyance due to transportation noise sources. Table 3.5-1 shows the compatibility between various land uses and CNEL.

Individual noise events, such as train passbys or aircraft overflights, are further described using single-event and cumulative noise descriptors. For single events, the maximum measured noise level (L_{max}) is often cited, as is the Sound Exposure Level (SEL). The SEL is the energy-based sum of a noise event of given duration that has been “squeezed” into a reference duration of one second, and is typically a value 5 to 10 dB higher than the L_{max}.

Table 3.5-1: Noise Land Use Compatibility Matrix

Land Use	Annual Community Noise Equivalent Level (CNEL) in decibels				
	55	60	65	70	75
Outdoor Amphitheatres					
Nature preserves, wildlife preserves, livestock farming; neighborhood and playgrounds					
Schools, preschools, libraries		45			
Residential- single family and multiple family, mobile homes, residential hotels, retirement homes, intermediate care facilities, hospitals, nursing homes		45			
Hotels and motels, other transient lodging; auditoriums, concert halls, indoor arenas, churches		45	45		
Office buildings- business, educational, professional and personal services; R&D offices and laboratories			50		
Riding stables, water recreation facilities, regional parks and athletic fields, cemeteries; outdoor spectator sports, golf courses					
Commercial- retail; shopping centers, restaurants, movie theatres			50	50	
Commercial- wholesale; industrial; manufacturing					
Agriculture (except residences and livestock), extractive industry, fishing, utilities, and public R-O-W					

Compatible: The outdoor community noise equivalent level is sufficiently attenuated by conventional construction that the indoor noise level is acceptable, and both indoor and outdoor activities associated with the land use may be carried out.

45 **Conditionally Compatible:** The outdoor community noise equivalent level will be attenuated to the indoor level shown, and the outdoor noise level is acceptable for associated outdoor activities.

Incompatible: The community noise equivalent level is severe. Although extensive mitigation techniques could make the indoor environment acceptable for performance of activities the outdoor environment would be intolerable for outdoor activities associated with the land use.

Sensitive Receptors

Some land uses are considered more sensitive to ambient noise levels than others due to the amount of noise exposure (in terms of both exposure time and "insulation" from noise) and the types of activities typically involved. Residences, motels and hotels, schools, libraries, churches, hospitals, nursing homes, auditoriums, natural areas, parks and outdoor recreation areas are generally more sensitive to noise than are commercial and industrial land uses. Consequently, the noise standards for sensitive land uses are more stringent than those for less sensitive uses, such as commercial and industrial.

To protect various human activities and sensitive land uses (e.g., residences, schools, and hospitals) lower noise levels are needed. A noise level of DNL 55 to 60 dB outdoors is the upper limit for intelligible speech communication inside a typical home. In addition, social surveys and case studies have shown that complaints and community annoyance in residential areas begin to occur at DNL 55 dB[1]. Sporadic complaints associated with the DNL 55 to 60 dB range give way to widespread complaints and individual threats of legal action within the DNL 60 to 70 dB range. At DNL 70 dB and above, residential community reaction typically involves threats of legal action and strong appeals to local officials to stop the noise.

Noise Sources

Some typical principal noise generators within the SCAG region are associated with transportation (i.e., airports, freeways, arterial roadways, seaports, and railroads). Additional noise generators include stationary sources, such as industrial manufacturing plants and construction sites. Local collector streets are not considered to be a significant source of noise since traffic volume and speed are generally much lower than for freeways and arterial roadways. Generally, transportation-related noise sources characterize the ambient noise environment of an area.

Freeways and Arterial Roadways

The 2004 RTP contains a detailed inventory of the current freeway system, currently comprising over 1,000 centerline miles of interconnected freeways throughout the six-county SCAG region. The magnitude of noise generated by a given roadway depends upon the overall traffic volume, the percentage of trucks (particularly "heavy trucks"), and average vehicle speed. Table 3.5-2 provides noise level measurements (in DNL at 200 feet from the roadway) for a sampling of road segments that generate some of the highest traffic noise levels in the SCAG region based on data on daily traffic volumes.

The extent to which traffic noise levels along these roads affect sensitive land uses depends upon a number of factors. These include whether the roadway itself is elevated above grade or

[1] United States Environmental Protection Agency. July 1981. *Noise effects handbook* (pp.8-2). Washington, DC: Author.

Table 3.5-2: Noise Levels Along Selected Freeways and Arterials in the SCAG Region

County	Freeway	Noise Monitoring Location	Annual Average Daily Traffic*	Noise Level at 200 feet (Lav)	Maximum Noise Level at 200 feet (Lmax)
Los Angeles	Interstate 5	12775 Encinitas Avenue, Sylmar	201,000	67.2	74.4
	Interstate 605	Pioneer Ave. & Strong Ave., Whittier	210,000	71.8	83.4
	Interstate 10	Walavista Road, Los Angeles	262,000	62.8	65.5
	Interstate 10	Dalewood Street, Baldwin Park	262,000	72	76.6
	Interstate 101	Oakdale Ave., Woodland Hills	233,000	63.2	71
	State Route 60	Garo Street & Pontenova Ave., Hacienda Heights	218,000	66.9	82.1
Orange	Interstate 405	Claremont St., Irvine	249,000	64.7	65.9
	Interstate 5	2441 Michelle Drive, Tustin	197,000	61.8	66.1
	State Route 57	8507 Whitewater Dr., Anaheim	198,000	69.1	77
	State Route 91	Tafolla St., & Kansas Ave., Placentia	214,000	65.6	71.2
San Bernardino	Interstate 10	Meadows Lane & Old Ranch Road, Colton	183,000	56.3	61.5
	Interstate 10	Rosewood & Spade, Loma Linda	183,000	64.4	76.2
	Interstate 10	10170 Cypress Ave., Fontana	183,000	61.9	78.1
Ventura	State Route 118	2315 Kuehner, Simi Valley	93,000	66.3	73.2
	U.S. Route 101	Willow & Skyline Dr., Thousand Oaks	124,000	66.3	73.2
Riverside	State Route 91	200 S. Washburn Ave., Corona	186,000	62.7	67.9
	Interstate 60	University Ave., Riverside	109,000	63.3	76.3
	Interstate 10	632 Wellwood Ave., Beaumont	59,000	66.2	71.9

All noise measurements were taken for a 15-minute interval during peak hours from 4 p.m. to 6 p.m.

*Annual average daily traffic volumes represent average values for each given segment based on data contained in California Department of Transportation's 1998 Traffic Volumes on California State Highways (June 1999).

Source: Southern California Association of Governments. (2001, February 1). *2004 RTP EIR*

depressed below grade, whether there are intervening structures or terrain between the roadway and the sensitive uses, and the distance between the roadway and such uses. For example, measurements show that depressing a freeway by approximately 12 feet yields a reduction in traffic noise relative to an at-grade freeway of 7 to 10 dB at all distances from the freeway.[2] Traffic noise from an elevated freeway is typically 2 to 10 dB less than the noise from an equivalent at-grade facility within 300 feet of the freeway, but beyond 300 feet, the noise radiated by an elevated and at-grade freeway (assuming equal traffic volumes, fleet mix, and vehicle speed) is the same.[3]

Additionally, the region has an enormous number of arterial roadways. Typical arterial roadways have one or two lanes of traffic in each direction, with some containing as many as four lanes in each direction. Noise from these sources can be a significant environmental concern where buffers (e.g., buildings, landscaping, etc.) are inadequate or where the distance from centerline to sensitive uses is relatively small. Given typical daily traffic volumes of 10,000 to 40,000 vehicle trips, noise levels along arterial roadways typically range from DNL 65 to 70 dB at a distance of 50 feet from the roadway centerlines.

Airports

The SCAG region's aviation system is one of the world's largest and most complex aviation systems. The region is composed of 57 public-use airports, including eight commercial service airports, 42 general aviation, 11 existing or recently closed military air bases, two limited commercial service airports and two joint-use facilities. In addition, there are other private-owned, private-use airports within the region which are not counted. Six of the commercial service airports handle the majority of passenger air traffic: Bob Hope Airport, John Wayne/Orange County, Long Beach, Los Angeles International, Ontario International and Palm Springs. Limited commercial service exists at Oxnard and Imperial County airports.

Railroad Operations

Railroad operations generate high, relatively brief, intermittent noise events. These noise events are an environmental concern for sensitive uses located along rail lines and in the vicinities of switching yards. Locomotive engines and the interaction of steel wheels and rails primarily generate rail noise. The latter source creates three types of noise: 1) rolling noise due to continuous rolling contact, 2) impact noise when a wheel encounters a rail joint, turnout or crossover, and 3) squeal generated by friction on tight curves. For very high speed rail vehicles, air turbulence can be a significant source of noise as well.[4] In addition, use of air horns and crossing bell gates contribute to noise levels in the vicinity of grade crossings. Table 3.5-3

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2 Beranek, L. L. 1988. *Noise and vibration control* (pp. 182). New York: McGraw-Hill.

3 *Ibid.*

4 Wyle Laboratories. July 1973. *Assessment of noise environments around railroad operations* (Research Report No. WCR 73-5 El Segundo, CA: Author.

Table 3.5-3: Reference Noise Levels for Various Rail Operations			
Source / Type		**Reference Conditions**	**Reference Noise Level (SEL)***
Commuter Rail, At-Grade	Locomotives	Diesel-Electric, 3,000 horsepower, throttle 5	92
		Electric	90
	Cars	Ballast, welded rail	82
Rail Transit		At-grade, ballast, welded rail	82
Automated Guideway Transit	Steel wheel	Aerial, concrete, welded rail	80
	Rubber tire	Aerial, concrete guideway	78
Monorail		Aerial straddle beam	82
Maglev		Aerial, open guideway	72

Notes: * Measured at 50 feet from track centerline with trains operating at 50 miles per hour. For the sake of comparison, an automobile passby event generates approximately SEL 73 dB, and a city bus generates approximately SEL 84 dB. SEL = Sound Exposure Level

Source: United States Department of Transportation, Federal Aviation Administration. (1995, April). *Transit noise and vibration impact assessment*. Washington, DC: Author.

provides reference noise levels in terms of Sound Exposure Levels (SEL) for different types of rail operations.

Freight Trains

Noise levels generated by freight train passby events reflect locomotive engine noise and rail car wheel rail interaction. The former depends upon track grade conditions (i.e., uphill versus downhill) and is largely independent of speed whereas the latter is highly speed dependent, increasing approximately 6 dB for each doubling of train velocity.[5] In addition to noise, freight trains also generate substantial amounts of ground-borne noise and vibration in the vicinity of the tracks. Ground-borne noise and vibration is a function of both the quality of the track and the operating speed of the vehicles.

The SCAG region has an extensive network of railroad lines belonging primarily to two major "Class I" railroads: Union Pacific Railroad (Union Pacific) and Burlington Northern Santa Fe Railway (BNSF).[6] A rail line supporting 40 freight trains per day generates approximately DNL 75 dB at 200 feet from the tracks. BNSF rail lines extend south from switching yards in eastern Los Angeles to the Los Angeles and Long Beach ports complex and east to Arizona and points beyond via San Bernardino County. BNSF generates approximately DNL 75 dB at a distance of

5 "Class I" railroads have annual gross revenues of $250 million or more.

6 Two of the major railroads that historically have been associated with California, the Southern Pacific Railroad and the Atchison, Topeka and Santa Fe Railway, have merged into other railroad companies. In 1995, the Atchison Topeka, and Santa Fe Railway merged with Burlington Northern to become Burlington Northern Santa Fe Railway. In the following year, the Southern Pacific Railroad merged with Union Pacific Railroad with the merged company retaining the Union Pacific name.

200 feet from the tracks. The Ventura County Railroad, owned by Rail America, Inc., serves the Port of Hueneme and connects with the Union Pacific in Oxnard.

Commuter and Inter-city Passenger Trains

This category includes passenger trains powered by either diesel or electric locomotives. In general, the noise generated by commuter rail facilities is from the locomotives themselves. In the SCAG region, there are two commuter and inter-city passenger train operators: AMTRAK and the Southern California Regional Rail Authority. AMTRAK operates trains with destinations in Seattle, Chicago, Orlando, San Diego, and San Luis Obispo. A typical AMTRAK passby event generates SEL 107 dB at 50 feet[7]; two such events during the daytime or evening periods generate approximately DNL 61 dB at 50 feet and approximately DNL 52 dB at 200 feet. Nine such events generate approximately DNL 67 dB at 50 feet and 58 DNL dB at 200 feet.

The Southern California Regional Rail Authority operates the Metrolink commuter rail system. This system currently includes seven rail lines, with destinations in Ventura, Los Angeles, San Bernardino, Riverside, Orange, and San Diego Counties. Noise levels generated by Metrolink are similar to those associated with AMTRAK.

Steel Wheel Urban Rail Transit

This category includes both heavy and light rail transit. Heavy rail is generally defined as electrified rapid transit trains with dedicated guideway, and light rail as electrified transit trains that do not require dedicated guideway. In general, noise increases with speed and train length. Sensitivity to rail noise generally arises when there is less than 50 feet between the rail and sensitive receptors. A significant percentage of complaints about noise can be attributed to the proximity of switches, rough or corrugated track, or wheel flats. In the SCAG region, the Los Angeles County Metropolitan Transit Authority (MTA) provides urban rail transit service on four lines within Los Angeles County. The Blue Line extends from Long Beach to the 7th Street Metro Center in downtown Los Angeles. The Red Line connects Union Station with North Hollywood via the Metro Center, the Gold Line connects Union Station with Pasadena, and the Green Line extends from Redondo Beach to Norwalk. As shown in Table 3.5-3, individual urban rail transit passby events generate substantially less noise than commuter rail events, but the aggregate noise impact for sensitive uses along the line can be similar or greater due to the much higher number of events.

Port Operations

The Ports of Long Beach, Los Angeles and Hueneme are major regional economic development centers. Noise is generated from four sources: ships using the port facilities, equipment associated with cargo activity within the port, and truck and rail traffic moving cargo to and from the ports. All sources affect the ambient noise levels in the port areas. Residential areas in San

7 County of Ventura. May 1988. *Ventura county general plan, hazards appendix*. Ventura, CA: Author.

Pedro (City of Los Angeles) and West Long Beach are affected most by truck and rail traffic related to the ports.

The Alameda Corridor provides a substantial long-term reduction in noise and vibration associated with rail operations in the vicinities of the Ports of Long Beach and Los Angeles. The Alameda Corridor consolidates the operations of Union Pacific and BNSF on 90 miles of existing branch line tracks into one 20-mile corridor along Alameda Street. This corridor provides a direct connection between the ports of Long Beach and Los Angeles and the Union Pacific and BSNF switching yards in eastern Los Angeles. The project includes four overpasses and three underpasses at intersections south of State Route 91 that allow vehicles to pass above the trains. North of State Route 91, trains pass through a 10-mile, 33-foot-deep trench. The construction of tracks in a below-grade trench, track construction on new base materials, and the use of continuous welded track reduce noise impacts on adjacent uses from trains associated with the ports. Also, the project includes sound walls in certain locations to mitigate vehicle noise along Alameda Street in residential neighborhoods and other sensitive areas.

Industrial, Manufacturing, and Construction-Related Noise Sources

Noise from industrial complexes, manufacturing plants and construction sites are characterized as stationary, or point, sources of noise even though they may include mobile sources, such as forklifts and graders. Local governments typically regulate noise from industrial, manufacturing, and construction equipment and activities through enforcement of noise ordinance standards, implementation of general plan policies, and imposition of conditions of approval for building or grading permits.

Industrial complexes and manufacturing plants are generally located away from sensitive land uses, and, as such, noise generated from these sources generally has less effect on the local community. In contrast to industrial and manufacturing plants, construction sites are located throughout the region and are often located within, or adjacent to, residential districts. In general, construction activities generate high noise levels intermittently on and adjacent to the construction sites, and the related noise impacts are short-term in nature. The dominant source of noise from most construction equipment is the engine, usually a diesel engine, with inadequate muffling. In a few cases, however, such as impact pile driving or pavement breaking, noise generated by the process dominates. Construction equipment can be considered to operate in two modes, stationary and mobile. Stationary equipment operates in one location for one or more days at a time, with either a fixed-power operation (pumps, generators, compressors) or a variable noise operation (pile drivers, pavement breakers). Mobile equipment moves around the construction site with power applied in cyclic fashion (bulldozers, loaders), or movement to and from the site (trucks).[8]

Construction-related noise levels generally fluctuate depending on the construction phase, equipment type and duration of use, distance between noise source and receptor, and presence or absence of barriers between noise source and receptor. Table 3.5-4 shows typical noise levels

[8] *Ibid.*

Table 3.5-4: Demolition and Construction Equipment Source Noise Levels		
Equipment Type	**Typical Equipment dB Level**	**Quieted Equipment dB Level***
Air Compressor	81	71
Backhoe	85	80
Concrete Pump	82	80
Concrete Vibrator	76	70
Concrete Breaker	82	75
Truck Crane	88	80
Dozer	87	83
Generator	78	71
Loader	84	80
Paver	88	80
Pneumatic Tools	85	75
Water Pump	76	71
Power Hand Saw	78	70
Shovel	82	80
Trucks	88	83
Pile Drivers	90	80

Notes: Noise levels for typical and quieted equipment at 50 feet from source. *Quieted equipment can be designed with enclosures, mufflers, or noise-reducing features.

Source: United States Environmental Protection Agency. (1971). *Noise from construction equipment and operations, building equipment and home appliances*. Washington, DC: U.S. Government Printing Office.

associated with various types of construction-related machinery. These noise levels, which correspond to a distance of 50 feet, decrease by approximately six dB with each doubling of distance from the construction site (e.g., noise levels from excavation might be approximately 83 dB at 100 feet from the site, and about 77 dB at 200 feet from the site). Interior noise levels from construction are approximately 10 dB (open windows) to 20 dB (closed windows) less than exterior noise levels due to the attenuation provided by building facades.[9]

REGULATORY SETTING

The federal government sets noise standards for transportation-related noise sources that are closely linked to interstate commerce, such as aircraft, locomotives, and trucks, and, for those noise sources, the state government is preempted from establishing more stringent standards. The state government sets noise standards for those transportation noise sources that are not preempted from regulation, such as automobiles, light trucks, and motorcycles. Noise sources

[9] Cornett, C.L. and Hina, C.E. 1979. *Methods for predicting noise and vibration impacts*. Washington, DC: United States Department of Transportation, Transportation Systems Center.

associated with industrial, commercial, and construction activities are generally subject to local control through noise ordinances and general plan policies.

Federal Agencies and Regulations

Federal regulations for railroad noise are contained in 40 CFR, Part 201 and 49 CFR, Part 210. The regulations set noise limits for locomotives and are implemented through regulatory controls on locomotive manufacturers.

Federal regulations also establish noise limits for medium and heavy trucks (more than 4.5 tons, gross vehicle weight rating) under 40 CFR, Part 205, Subpart B. The federal truck passby noise standard is 80 dB at 15 meters from the vehicle pathway centerline. These controls are implemented through regulatory controls on truck manufacturers. The U.S. Department of Transportation's Federal Highway Administration's regulations[10] for noise abatement must be considered for federal or federally-funded projects involving the construction of a new highway or significant modification of an existing freeway when the project would result in a substantial noise increase or when the predicted noise levels approach or exceed the "Noise Abatement Criteria." Under the regulations, a "substantial increase" is defined as an increase in L_{eq} of 12 dB during the peak hour of traffic noise. For sensitive uses, such as residences, schools, churches, parks, and playgrounds, the Noise Abatement Criteria for interior and exterior spaces is L_{eq} 57 and 66 dB, respectively, during the peak hour of traffic noise.

Aircraft operated in the U.S. are subject to certain federal requirements regarding noise emissions levels. These requirements are set forth in Title 14 of the *Code of Federal Regulations* (14 CFR), Part 36. Part 36 establishes maximum acceptable noise levels for specific aircraft types, taking into account the model year, aircraft weight, and number of engines. Pursuant to the federal Airport Noise and Capacity Act of 1990, the Federal Aviation Administration established a schedule for complete transition to Part 36 "Stage 3"[11] standards by year 2000. This transition schedule applies to jet aircraft with a maximum takeoff weight in excess of 75,000 pounds, and thus applies to passenger and cargo airlines, but not to operators of business jets or other general aviation aircraft.

Although the National Environmental Policy Act (NEPA) does not establish specific noise standards, the noise impacts of projects are routinely considered as one of the potential environmental consequences of federal actions subject to NEPA.

State Agencies and Regulations

The State of California has the authority to establish regulations requiring airports to address aircraft noise impacts on land uses in their vicinities. The State of California's Airport Noise Standards, found in Title 21 of the *California Code of Regulations*, identify a noise exposure level

10 23 Code of Federal Regulations (CFR) 772.

11 Stage 3 aircraft incorporate more recent jet engine noise suppression technology; Stage 2 aircraft are intermediate between Stage 3 and Stage 1, which is made up of older technology turbojet aircraft.

of CNEL 65 dB as the noise impact boundary around airports. Within the noise impact boundary, airport proprietors are required to ensure that all land uses are compatible with the aircraft noise environment or the airport proprietor must secure a variance from the California Department of Transportation.

The State of California establishes noise limits for vehicles licensed to operate on public roads. For heavy trucks, the State passby standard is consistent with the federal limit of 80 dB. The State passby standard for light trucks and passenger cars (less than 4.5 tons gross vehicle rating) is also 80 dB at 15 meters from the centerline.[12] For new roadway projects, the California Department of Transportation employs the Noise Abatement Criteria, discussed above in connection with the Federal Highway Administration.

The California Noise Insulation Standards found in the *California Code of Regulations*, Title 24, set requirements for new multi-family residential units, hotels, and motels that may be subject to relatively high levels of transportation-related noise. For exterior noise, the noise insulation standard is DNL 45 dB in any habitable room and requires an acoustical analysis demonstrating how dwelling units have been designed to meet this interior standard where such units are proposed in areas subject to noise levels greater than DNL 60 dB.

Local Agencies and Regulations

To identify, appraise, and remedy noise problems in the local community, each county and city in the SCAG region has adopted a noise element as part of its General Plan. Each noise element is required to analyze and quantify current and projected noise levels associated with local noise sources, including, but not limited to, highways and freeways, primary arterials and major local streets, rail operations, air traffic associated with the airports, local industrial plants, and other ground stationary sources that contribute to the community noise environment.

Beyond statutory requirements, local jurisdictions are free to adopt their own goals and policies in their noise elements, although most jurisdictions have chosen to adopt noise / land use compatibility guidelines that are similar to those recommended by the State. The overlapping DNL ranges indicate that local conditions (existing noise levels and community attitudes toward dominant noise sources) should be considered in evaluating land use compatibility at specific locations.

In addition to regulating noise through noise element policies, local jurisdictions regulate noise through enforcement of local ordinance standards. These standards generally relate to noisy activities (e.g., use of loudspeakers and construction) and stationary noise sources and facilities (e.g., air conditioning units and industrial activities).

Three cities in the SCAG region, Los Angeles, Long Beach and Port Hueneme, operate port facilities. Noise from the Ports of Los Angeles, Long Beach and Hueneme are regulated by the

[12] California Vehicle Code Sections 23130 and 23130.5; 27150 et.seq.; 27204 and 27206.

noise ordinances and noise elements of the Los Angeles, Long Beach and Port Hueneme General Plans.

In terms of airport noise, some of the actions that airport proprietors have been allowed to take to address local community noise concerns include runway use and flight routing changes, aircraft operational procedure changes, and engine run-up restrictions. These actions generally are subject to approval by the Federal Aviation Administration, which has the authority and responsibility to control aircraft noise sources, implement and enforce flight operational procedures, and manage the air traffic control system. Airport proprietors may also consider limitations on airport use, but such restrictions can be overridden by the Federal Aviation Administration if it is determined that they unjustly discriminate against any user, impede the Federal interest in safety and management of the air navigation system, or unreasonably interfere with interstate commerce.

METHODOLOGY

This section summarized the methodology used to evaluate the expected noise impacts from implementing the 2004 RTP.

Comparison with the No Project

The analysis of noise impacts includes a comparison between the expected future conditions with the proposed Plan and the expected future conditions if no Plan were adopted. This evaluation is not included in the determination of the significance of impacts; however, it provides a meaningful perspective on the effects of the 2004 RTP.

Determination of Significance

Noise associated with highway traffic is dependent on a number of variables including:

- traffic volume,
- motor vehicle speed,
- motor vehicle fleet mix (cars, trucks, etc.), and
- location of the roadway with respect to sensitive receptors.

Noise from highway traffic is generally measured in terms of one-hour equivalent steady-state sound levels that contain the same acoustic energy as a time-varying sound level (L_{eq1h}). Following Federal Highway Administration (FHWA) guidance, noise impacts occur when predicted noise levels increase substantially when compared to existing levels, or when noise levels approach or exceed the FHWA's noise abatement criteria (NAC).

To evaluate the alternatives, the existing condition (2000) was compared with the future 2030 alternatives. The comparison was accomplished using a Geographic Information System (GIS)

analysis program. The network traffic results for the existing condition and for the plan were incorporated into an ArcView GIS project and roadways where it is anticipated that noise levels will increase 3 dBA or more above existing levels were identified.

The evaluation also considered the potential for absolute noise impacts. Following guidance published by Caltrans, a noise impact is determined to occur if predicted noise levels approach the NAC by 1 dBA (66 dBA).

To eliminate facilities from the evaluation where there would not be the potential for 66 dBA to occur, the following were identified and eliminated from consideration:

- Arterials where, at a distance of 100 from the edge of pavement, the FHWA's Traffic Noise Model (TNM) indicated that the motor vehicle volume (and the medium/heavy truck percentage) resulted in traffic noise levels less than 66 dBA.

- Arterials where the calculated motor vehicle speed was less than 17 miles per hour.

- Interstates where the calculated motor vehicle speed was less than 30 miles per hour.

Roadways anticipated to have an increase of 3 dBA from existing conditions are roadways where:

- the total traffic volume increases 100 percent from existing conditions,

- the truck (medium and heavy) volume increases by 130 percent from existing conditions, or

- the truck (medium and heavy) volume increases by 100 percent with an increase in other vehicles of 50 percent.

Since noise is a highly localized impact, specific and detailed analyses are most appropriate at the project level. Therefore the method used to assess noise impacts of the 2004 RTP is to review the list of proposed transportation improvements and assess the likelihood of potentially significant noise impacts based on the type of project, location and general land uses.

SIGNIFICANCE CRITERIA

A significant impact is defined as "a substantial or potentially substantial, adverse change in the environment" (CEQA § 21068). The proposed Plan would have a significant noise impact if implementation would potentially result in:

- Noise levels, groundborne noise levels and excessive groundborne vibration that increase substantially and temporarily adjacent to transportation facility construction.

- Noise levels, groundborne noise levels and excessive groundborne vibration that increase substantially and permanently adjacent to transportation facilities.
- Noise levels that increase substantially and permanently adjacent to sensitive receptors.

- A cumulatively considerable increase in regional ambient noise levels.

IMPACTS AND MITIGATION MEASURES

Impact 3.5-1: Grading and construction activities associated with the proposed freeway, arterial, transit and Maglev projects identified in the 2004 RTP would intermittently and temporarily generate noise levels above ambient background levels. Noise levels in the immediate vicinity of the construction sites would increase substantially sometimes for extended duration. This would be considered a significant impact in some cases.

The freeway and arterial projects proposed in the 2004 RTP include the widening of existing freeways and the construction of new interchanges. A few projects would involve constructing new freeway segments, including auxiliary capacity enhancement facilities and mixed flow connectors. However, many projects proposed in the 2004 RTP would not involve construction activities.

Construction activities associated with the proposed Plan would result in temporary noise increases at nearby sensitive receptors. Table 3.5-5 presents the different types of freeway, transit and goods movement projects which typically emit noise during construction. The table also shows the duration of construction noise created by project type. Impacts to sensitive receptors resulting from these proposed projects would depend on several factors such as the type of project proposed for the given area, land use of the given area, and duration of proposed construction activities. Additionally, construction noise levels would fluctuate depending on construction phase, equipment type, and duration of use; distance between noise source and receptor; and presence or absence of barriers between noise source and receptor.

In general, sensitive receptors could be significantly affected by projects involving the construction of new systems (new facilities, capacity enhancement facilities, rail corridors, interchanges, underground rail lines). Specifically, sensitive receptors located in the vicinity of these projects could be significantly impacted by construction of the proposed projects. Additionally, modification projects would result in short-term construction impacts to sensitive receptors. See Section 3.1, Land Use, for further discussion.

Short-term significant impacts would occur during the construction stage of individual projects. This would be considered a **significant impact.**

Maglev System

Construction-related noise and vibration impacts of the proposed Maglev System are discussed in Maglev Environmental Assessment (EA) report prepared by Parsons Transportation Group Inc., in February, 2000.

Table 3.5-5: Types and Duration of Noise Produced by Proposed Projects						
Project Type	**Noise Levels**			**Duration**		
	High	**Medium**	**Low**	**Extended**	**Medium**	**Short**
Freeways and Arterials						
Arterials/Interchanges	X			X		
Expressway	X			X		
Freeway – mixed flow	X			X		
HOV connector	X			X		
Reconfigure ramp	X			X		
Replace overcrossing	X			X		
Capacity enhancement facilities	X			X		
Widen underpass 4-6 lanes	X			X		
Auxiliary lanes		X			X	
Climbing lanes		X			X	
HOT lanes		X			X	
Interchange addition		X			X	
Bikeways		X				X
Capacity enhanced arterial		X				X
Interchange improvement		X			X	
Park & ride		X				X
Roadway operations & maintenance			X			X
Smart Street improvements			X			X
Transit						
Commuter rail	X			X		
High Speed Rail	X			X		
Inter-city rail	X			X		
Transit center		X			X	
Grade crossing			X			X
Intelligent Transportation System			X			X
Light rail	X			X		
Rail improvement	X			X		
Rail tunnel improvement	X			X		
Goods Movement						
Port rail access improvements	X			X		

Note: Project specific impacts depend on location and location of sensitive receptors. This table provides a general assessment of noise-generated by different types of impacts irrespective of the relationship to sensitive receptors.

Mitigation Measures

MM 3.5-1a: Project implementing agencies shall comply with all local sound control and noise level rules, regulations, and ordinances.

MM 3.5-1b: Project implementing agencies shall limit the hours of construction to between 6:00 a.m. and 8:00 p.m. on Monday through Friday and between 7:00 a.m. and 8:00 p.m. on weekends.

MM 3.5-1c: Equipment and trucks used for project construction shall utilize the best available noise control techniques (including mufflers, intake silencers, ducts, engine enclosures and acoustically attenuating shields or shrouds) in order to minimize construction noise impacts.

MM 3.5-1d: Impact equipment (e.g., jack hammers, pavement breakers, and rock drills) used for project construction will be hydraulically or electrically powered wherever possible, to avoid noise associated with compressed air exhaust from pneumatically powered tools. However, where use of pneumatically powered tools is unavoidable, an exhaust muffler on the compressed air exhaust would be used; this muffler can lower noise levels from the exhaust by up to about 10 dBA. External jackets on the tools themselves should be used where feasible, and this could achieve a reduction of 5 dBA. Quieter procedures will be used such as the use of drilling rather than impact equipment, whenever feasible.

MM 3.5-1e: Project implementing agencies shall ensure that stationary noise sources will be located as far from sensitive receptors as possible. If they must be located near existing receptors, they will be adequately muffled.

MM 3.5-1f: The project implementing agencies shall designate a complaint coordinator responsible for responding to noise complaints received during the construction phase. The name and phone number of the complaint coordinator will be conspicuously posted at construction areas and on all advanced notifications. This person will be responsible for taking steps required to resolve complaints, including periodic noise monitoring, if necessary.

MM 3.5-1g: Noise generated from any rock-crushing or screening operations performed within 3,000 feet of any occupied residence shall be mitigated by the project proponent by strategic placement of material stockpiles between the operation and the affected dwelling or by other means approved by the local jurisdiction.

MM 3.5-1h: Project implementing agencies shall direct contractors to implement appropriate additional noise mitigation measures including, but not limited to, changing the location of stationary construction equipment, shutting off idling equipment, rescheduling construction activity, notifying adjacent residents in advance of construction work, and installing acoustic barriers around stationary construction noise sources to comply with local noise control requirements.

MM 3.5-1i: Project implementing agencies shall implement use of portable barriers during construction of subsurface barriers, debris basins, and storm water drainage facilities.

MM 3.5-1j: In residential areas, pile driving will be limited to daytime working hours. No pile-driving or blasting operations shall be performed within 3,000 feet of an occupied residence on Sundays, legal holidays, or between the hours of 8:00 p.m. and 8:00 a.m. on other days. Any variance from this condition shall be obtained from the project proponent and must be approved by the local jurisdiction.

MM 3.5-1k: Wherever possible, sonic or vibratory pile drivers will be used instead of impact pile drivers (sonic pile drivers are only effective in some soils). If sonic or vibratory pile drivers are not feasible, acoustical enclosures will be provided as necessary to ensure that pile driving noise does not exceed speech interference criterion at the closest sensitive receptor.

MM 3.5-1l: Engine and pneumatic exhaust controls on pile drivers will be required as necessary to ensure that exhaust noise from pile driver engines is minimized to the extent feasible.

MM 3.5-1m: Where feasible, pile holes will be pre-drilled to reduce potential noise and vibration impacts.

Significance After Mitigation

The above mitigation measures would reduce noise impacts; however, construction noise would still be **significant in the short term**.

Impact 3.5-2: Noise-sensitive land uses could be exposed to noise in excess of normally acceptable noise levels or substantial increases in noise as a result of the operation of expanded or new transportation facilities (i.e., increased traffic resulting from new highways, addition of highway lanes, roadways, ramps, and new use of new transit facilities as well as increased use of existing transit facilities, etc.). This is considered a potentially significant impact.

For this regional scale of analysis, the unmitigated noise impacts of new highways, highway widening, new HOV lanes, new transit corridors, and increased frequency along existing transit corridors are generally expected to exceed the significance criteria when sensitive noise receptors are in proximity. Table 3.5-6 lists projects with potential noise impacts from proposed new and expanded facilities—highway, freeway, rail transit, tollway, truck-climbing lanes, freeway interchanges, and Maglev projects. Arterials, TDMs, O&M, grade crossings, ramp and interchange improvements, county-wide bus route expansions, and transit facility improvements are not specifically considered here, as both operational and cumulative noise impacts are found to be potentially significant.

It should be noted that the list of projects identified in the following table are indicative of projects most likely to generate potentially significant noise impacts due to facility operation, but the list is neither exhaustive nor definitive. Each of the projects included in the 2004 RTP would need to be evaluated independently as part of its own environmental assessment and review process.

Freeways

Changes in the percentage of miles of noise affected freeways and arterials are a direct result of increases and decreases in the traffic volumes, changes in fleet mix, and speeds assigned to each roadway in each county and additional interstate facilities proposed with the “build” scenarios.

Table 3.5-6: Draft 2004 RTP Projects With Potential Noise Impacts

CO	Route/Program	From	To	Description
IM	SR-115	I-8	Evan Hewes Hwy	Construct 4 lane extension.
IM	SR-98	Sr-111	Dogwood/SR-98	Corridor improvements- widening or realignment.
IM	Dogwood Rd. Corridor/I-8	SR-98	I-8	Corridor improvements- widen to six lanes from McCabe to I-8. I-8 improvement to six lanes.
IM	SR-111	SR-98	I-8	Upgrade to 4-lane freeway with interchange(s) at several locations
LA	SR-14	Ave. P-8	Ave. L	Add 1 HOV lane each dir
LA	I-710	I-10	Huntington Dr	Construct 1 HOV lane each dir
LA	I-710	Huntington Dr	I-210	Construct 1 HOV lane each dir
LA	I-710	I-10	Huntington Dr	Construct 3 MF lanes each dir
LA	I-710	Huntington Dr	I-210	Construct 3 MF lanes each dir
LA	I-5/SR-170	North to South/South to North		HOV Connector
LA	I-5/I-405	North to South/South to North		HOV Connector
LA	I-5 Interchanges	Orange County Line	Rosemead Blvd	Interchange improvements
LA	SR-57/SR-60			Interchange improvement
LA	Metrolink Commuter Rail	Countywide		Service Expansion
LA	Green Line Extension	Mariposa@Nash to Century@Sepulveda (LAX Term.)		Light Rail
LA	Crenshaw Corridor			Transit Corridor (technology TBD)
LA	Gold Line Extension	Pasadena	Claremont	Light Rail
LA	Metro Center Connector	Blue Line/Exposition Line	Gold Line	Downtown Light Rail Connector
LA	Red Line Extension	Western Ave	Fairfax Ave	Subway
LA	US-101	SR-23	SR-134/SR-170	User-Fee-Backed Capacity Enhancement
OR	SR-91/SR-241			Add direct toll-to-toll or HOV connection from north/south SR-241 to SR-91 toll lanes to/from the east

Table 3.5-6: Draft 2004 RTP Projects With Potential Noise Impacts

CO	Route/Program	From	To	Description
OR	SR-91	SR-241	SR-71	Add toll lane and toll connection at SR-71 (RIV) (per Four Corners Study)
OR	I-5 NB/SB	Coast Highway	Pico	Add 1 HOV lane each direction
OR	I-405/I-605			HOV Connector
OR	SR-57 NB	Orangethorpe	Lambert	MF or Aux Capacity
OR	SR-57 NB	at SR-91		Add 4th through lane
OR	SR-91 EB/WB	SR-55	Riverside County Line	Add 1 MF lane each direction
OR	I-405	SR-73	Beach	Add 1 MF lane each direction
OR	I-5 SB	La Paz Road	Oso Parkway	Extend auxiliary lane through interchange
OR	I-5 SB	Alicia Parkway		Extend auxiliary lane through interchange
OR	SR-55	17th / 4th / I-5 area		Add southbound auxiliary lane from SR-22 to I-5 to address lane drop/merge issues
OR	SR-55 SB	Dyer	Mac Arthur	Auxiliary lane
OR	SR-57 NB	Katella on-ramp	Lincoln off-ramp	Auxiliary lane, full standard median
OR	SR-57 SB	Ball off ramp	Katella on ramp	Add auxiliary lane
OR	SR-91 WB	SR-71	SR-241	Add auxiliary lane

Table 3.5-6: Draft 2004 RTP Projects With Potential Noise Impacts

CO	Route/Program	From	To	Description
OR	SR-91 EB	SR-241	SR-71	Add auxiliary lane EB which drops at Green River, another extends to SR-71
OR	SR-91 WB	NB SR-55	WB SR-91 at Tustin	Add auxiliary lane
OR	SR-91 WB	SR-57	I-5 (WB Only)	Add auxiliary lane
OR	I-405 NB	SR-133	Sand Canyon	Widen NB I-405 SR-133 to Sand Canyon, add aux lane
OR	I-405 SB	Irvine Center Drive	Irvine Center Drive	Add 2nd auxiliary lane
OR	I-405 NB	Jeffrey	Culver	Add auxiliary lane
OR	I-405 NB	Sand Canyon	Culver	Tie auxiliary lanes together
OR	I-405 SB	Beach	I-605	Continuous auxiliary lane, operational improvements
OR	I-5 NB/SB	La Paz Road		Re-construct interchange to increase storage capacity of ramps
OR	Fixed Route Bus	Countywide		Countywide Fixed Route, Express, Rail Feeder, Rapid Bus. Expand local service to achieve 10-minute headways in the core of the county. Expand to 2.5 million annual vsh by 2030.
OR	Metrolink Commuter Rail	Orange Line/IEOC Line/91 Line		Expand service - Orange Line to 30 daily trains, IEOC to 21 daily trains, 91 line to 21 daily trains. Plan for midday intracounty service Laguna Niguel to Fullerton.
OR	Track La Mirada Basta	La Mirada		DT Junction to La Mirada Triple Track
OR	Metrolink Commuter Rail	Anaheim Stadium		Parking Structures and Platform Extensions - Metrolink Station
OR	SR-57 NB	Lambert	Tonner Canyon Road	Truck Climbing Lane
OR	Centerline Light Rail	Orange County	Orange County	Extension of the Orange County Centerline Light Rail
RV	CETAP - Hemet to Corona/Lake Elsinore	Hemet	Corona/Lake Elsinore	Ramona/Cajalco expressway (3 lanes each dir) from Sanderson Ave to I-15

Table 3.5-6: Draft 2004 RTP Projects With Potential Noise Impacts

CO	Route/Program	From	To	Description
RV	CETAP - Moreno Valley to San Bernardino County	Moreno Valley	San Bernardino County	Construct new intercounty transportation corridor
RV	CETAP - Riverside County to Orange County	Riverside County	Orange County	Construct new intercounty transportation corridor
RV	CETAP - Temecula Corridor	Winchester (SR-79/SR-74)	Temecula	On I-15, widen to 1 HOV & 6 MF each dir from I-215 to Winchester, 1 HOV & 5 MF each dir from Winchester to San Diego County Line; on I-215, widen to 1 HOV & 4 MF each dir from Newport Rd to I-15; improve I-15/I-215 interchange
RV	SR-60/I-215	SR60/I-215 E. Jct	East to SR-60 and South to I-215	HOV Connector
RV	I-15	San Diego County Line (R0.0)	SR-60 (51.5)	Add 1 HOV lane each direction (EA's 33790G, 33800G)
RV	SR-91/I-15	South to West/West to South		HOV Connector
RV	I-215	SR-60/SR-91/I-215 Jct	San Bernardino County Line	Add 1 MF and 1 HOV lane each direction (EA 467200)
RV	I-10	Monterey Ave (44.5)	Dillon Rd (58.9)	Add 1 MF lane each direction (EA 0A030K)
RV	I-10/SR-60			Construct new interchange
RV	I-215	Eucalyptus Ave (R37.4)	I-15 (R8.9)	Add 1 MF lane each direction (EA's 35380K, 35390K, 35370K)
RV	SR-71	SR-91	San Bernardino County Line	Widen to 3 MF lanes each direction
RV	SR-91	Pierce Street	Orange County Line	Add 1 MF lane each direction
RV	SR-91/SR-71			Improve interchange

Table 3.5-6: Draft 2004 RTP Projects With Potential Noise Impacts

CO	Route/Program	From	To	Description
RV	SR-79	Ramona Expwy	Domenigoni Parkway	Realign highway (construct 4 lanes)
RV	SR-79	Hunter	Ramona Expwy	Widen from 4 to 6 lanes (note: RTIP#46460 widens to 6 lanes from Hunter to Domenigoni)
RV	Metrolink Commuter Rail	Countywide		Metrolink Improvements (track, rolling stock)
RV	Metrolink Commuter Rail	IEOC & 91 Lines		Metrolink Rail Station Improvements
RV	Metrolink Commuter Rail			Metrolink Construct New Station At 3360 Van Buren Blvd In Riverside (Parking 550 Spaces)
RV	I-10	San Bernardino County Line (R0.0)	Banning City Limits (12.9)	Add eastbound truck climbing lane
RV	SR-60	Badlands area e/o Moreno Valley	Badlands area - w/o SR-60/I-10 Jct	Add eastbound truck climbing lane
SB	I-10	I-15	SR-38	Add 1 HOV lane each direction, widen UC's, reconstruct ramps
SB	I-10	SR-38	Yucaipa Bl	Add 1 HOV lane each direction
SB	I-10	Yucaipa Bl	Riverside County Line	Add 1 HOV lane each direction
SB	I-15	Riverside County Line	I-215	Add 1 HOV lane each direction
SB	I-15	I-215	US-395	Add 1 HOV lane each direction
SB	I-15	US-395	D St	Add 1 HOV lane each direction
SB	I-215	Riverside County Line	I-10	Add 1 HOV lane each direction
SB	I-215	SR-30	I-15	Add 1 HOV lane each direction
SB	I-10/I-215	South to East/East to South		HOV Connector
SB	I-10/I-15	South to West/West to South		HOV Connector
SB	I-10/I-15	North to West/West to North		HOV Connector

Table 3.5-6: Draft 2004 RTP Projects With Potential Noise Impacts

CO	Route/Program	From	To	Description
SB	I-215	Riverside County Line	I-10	Add 1 MF lane each direction
SB	I-215	I-10	SR-30	Add 1 MF lane each direction (restriping)
SB	I-215	SR-30	I-15	Add 1 MF lane each direction
SB	SR-210	I-215	I-10	Add 1 MF lane each direction and widen UC's
SB	SR-18	Los Angeles County Line	US 395	Widen from 1 to 2 lanes each dir
SB	SR-18	0.8 mi west of Orchard Dr (PM 79.9)	2.1 mi west of Orchard Dr (PM 81.2)	Construct Passing Lanes (PM 79.9/81.2) and Turn Lanes (PM 73.76/84.33)
SB	SR-38 (Orange/Lugonia)	Redlands City Limit (W)	Redlands City Limit (E)	Widen from 1 to 2 lanes each dir
SB	SR-62 (Twentynine Palms Hwy)	Fairway Dr	SR-247	Widen from 2 to 3 lanes each dir
SB	SR-62	At Colorado River (PM141.9/143.1)		Bride widening from 2 to 4 lanes
SB	SR-83 (Euclid)	Merril Av	Kimball Av	Widen from 2 to 4 lanes each dir
SB	SR-142 (Chino Hills Pkwy)	Carbon Canyon Rd	Pipeline Dr	Widen from 2 to 3 lanes each dir
SB	SR-247 (Old Woman Springs Rd)	North of SR-62	Griffith Rd	Widen from 1 to 2 lanes each dir
SB	San Bernardino-Redlands Extension	4th St/Vernon	Grove/Central	Extend rail service to Redlands (10 miles); rail technology TBD; 15-min. freq. daily
SB	Gold Line Extension	Claremont in Los Angeles County	Montclair in San Bernardino County	Light Rail extension (1.5 miles)
SB	Metrolink Commuter Rail	Countywide		Service Expansion; SB Line 52 daily trains, Riverside line 40 daily trains, IEOC line 28 daily trains
SB	Local Transit Service	Countywide		Local Transit Service
SB	Elderly & Handicapped Assistance	Countywide		Elderly & Handicapped Assistance

Table 3.5-6: Draft 2004 RTP Projects With Potential Noise Impacts

CO	Route/Program	From	To	Description
SB	I-15	Devore	Summit	Truck Climbing Lane
VE	SR-33 (Casitas Bypass)	Foster Park	Creek Rd	Expressway
VE	SR-118	SR-232	Moorpark	Expressway
VE	Metrolink Commuter Rail	Ventura	Los Angeles County Line	Service Expansion
VE	Tunnel 26			Rail Tunnel Reconstruction
VE	Metrolink Commuter Rail	Coast Main Line		Enhanced Metrolink Capital Maintenance
REG	Maglev	Regionwide		By 2015 - IOS (West LA to Ontario); By 2030 - Total Regional System
REG	I-710 Corridor	Port of Long Beach/Los Angeles	SR-60	User Fee-Backed Capacity Improvement
REG	East-West Corridor (I-210, SR-210, I-10, SR-60, SR-91)	I-710 Corridor	I-10/SR-60 Interchange	User Fee-Backed Capacity Improvement
REG	I-15 Corridor	Eastern Gateway Corridor	Barstow	User Fee-Backed Capacity Improvement
REG	Regional rail capacity improvement program	Regionwide		Main line tracks and grade separation improvements

Table 3.5-7 shows the percentage of freeways and arterials in each county and in the region that would experience noise levels exceeding 66 dBA, the Caltrans noise abatement criteria for noise sensitive land uses. The evaluation did not take into account whether there are sensitive receptors located adjacent to the freeways and arterials, but evaluates all roadways equally regardless of whether sensitive land uses are located adjacent thereto.

Transit

The 2004 RTP includes projects for rail transit and Metrolink. It is anticipated that any noise sensitive land uses located immediately adjacent to these lines would be significantly impacted. The existing urban rail and Metrolink system would experience increased use. Sensitive uses located along existing lines would be further exposed to noise associated with increased rail and light rail activities.

Maglev System

The environmental document for the Maglev system concludes that areas separated from the Maglev alignment by an existing freeway would not experience impacts because of the distance from the Maglev guideway. In addition, noise levels generated from the existing freeway are expected to be greater than the Maglev operational noise at the opposite side of the freeway.

Mitigation Measures

MM 3.5-2a: As part of the appropriate environmental review of each project, a project specific noise evaluation shall be conducted and appropriate mitigation identified and implemented.

MM 3.5-2b: Project implementation agencies shall employ, where their jurisdictional authority permits, land use planning measures, such as zoning, restrictions on development, site design, and use of buffers to ensure that future development is compatible with adjacent transportation facilities.

MM 3.5-2c: Project implementation agencies shall, to the extent feasible and practicable, maximize the distance between noise-sensitive land uses and new roadway lanes, roadways, rail lines, transit centers, park-and-ride lots, and other new noise-generating facilities.

MM 3.5-2d: Project implementation agencies shall construct sound reducing barriers between noise sources and noise-sensitive land uses. Sound barriers can be in the form of earth-berms or soundwalls. Constructing roadways so as appropriate and feasible that they are depressed below-grade of the existing sensitive land uses also creates an effective barrier between the roadway and sensitive receptors.

MM 3.5-2e: Project implementation agencies shall, to the extent feasible and practicable, improve the acoustical insulation of dwelling units where setbacks and sound barriers do not sufficiently reduce noise.

Table 3.5-7: Percentage of Roadways Where Noise Levels Exceed 66 dBA* (Regardless of Land Use)

Scenario	Facility	Los Angeles County	Orange County	Riverside County	San Bernardino County	Ventura County	Total (region-wide)
2000 (Existing)	Freeways	90%	97%	98%	100%	100%	95%
	Arterials	17%	24%	22%	22%	23%	20%
2030 No Project	Freeways	93%	94%	95%	96%	98%	95%
	Arterials	23%	25%	30%	23%	24%	24%
2030 Plan	Freeways	90%	98%	95%	100%	99%	95%
	Arterials	21%	21%	30%	25%	15%	23%
2030 Modified RTP	Freeways	89%	98%	95%	100%	99%	94%
	Arterials	22%	21%	31%	25%	16%	24%
2030 PILUT 1	Freeways	93%	99%	94%	100%	97%	96%
	Arterials	22%	18%	27%	27%	17%	23%
2030 PILUT 2	Freeways	94%	99%	96%	99%	97%	96%
	Arterials	21%	19%	27%	24%	15%	22%

* A noise level above 66 dBA is the Caltrans noise abatement criteria for sensitive receptors; this table does not include consideration of adjacent land uses but evaluates all roadways equally regardless of adjacent uses.

Note: for future conditions (2030) table includes roadways where noise levels increase by 3dBA or more and result in a noise level greater than 66 dBA.

MM 3.5-2f: The project implementation agencies shall implement, to the extent feasible and practicable, speed limits and limits on hours of operation of rail and transit systems, where such limits may reduce noise impacts.

MM 3.5-2g: To reduce noise impacts, maximize distance of the Maglev route alignment from sensitive receptors. If the Maglev guideway is constructed along the center of a freeway, operation noise impacts would be reduced by the increase in distance to the noise sensitive sites and the masking effects of the freeway traffic noise.

MM 3.5-2h: Reduce Maglev speed in the vicinity of sensitive receptors.

MM 3.5-2i: As a last resort, eliminate the noise-sensitive receptor by acquiring rail and freeway right-of-way. This would ensure the effective operation of all transportation modes.

MM 3.5-2j: Passenger stations, central maintenance facilities, decentralized maintenance facilities, and electric substations should be located away from sensitive receptors.

Significance After Mitigation

Although mitigation measures are implemented for the impact, it may not reduce noise levels to below regulatory levels, therefore, the impact would be **significant**.

Impact 3.5-3: Sensitive receptors could be exposed to noise in excess of normally acceptable noise levels or substantial increases in noise as a result of the operation of expanded or new transportation facilities (i.e., increased traffic resulting from new highways, addition of highway lanes, roadways, ramps, and new use of new transit facilities as well as increased use of existing transit facilities, etc.). This is considered a potentially significant impact.

Using GIS and overlaying the Draft 2004 RTP projects on land uses, it is possible to determine the number of sensitive receptors that could face a substantial and permanent increase in noise levels. Using a 150' buffer, at least the following sensitive receptors could be impacted by the proposed 2004 RTP Projects:

- 1 college
- 1 hospital
- 4 elementary schools
- 3 middle schools
- 1 vocational high school
- 2 high schools
- 2 senior citizen's facilities
- 7 religious schools.

Mitigation Measures

Mitigation measures intended to reduce the noise impacts on sensitive receptors are part of the 2004 RTP. These include: site design, buffers, soundwalls, etc. Further reduction in noise impacts would be obtained through the implementation of the measures described in **MM 3.5-2a through MM 3.5-2j**.

Significance After Mitigation

Although mitigation measures are recommended for the impact, they may not reduce noise levels to below regulatory levels. Therefore, the impact would be **significant.**

Cumulative Impact 3.5-4: Regional cumulative ambient noise levels could increase to exceed normally acceptable noise levels or have substantial increases in noise as a result of the operation of expanded or new transportation facilities (i.e., increased traffic

resulting from new highways, addition of highway lanes, roadways, ramps, and new use of new transit facilities as well as increased use of existing transit facilities, etc.). This is considered a potentially significant impact.

The projects included in the 2004 draft RTP could have a significant impact on total noise in the region. Many of the projects involved construction and that potential noise is outlined in **Impact 3.5-1**. While the construction noise is temporary and short term at the project level, the cumulative construction noise region wide could be significant. Over the course of the planning horizon there is likely to be constant construction within the region.

Forecasts for population and job growth are one factor driving the potential increase of ambient noise in the region. Sources of ambient noise increase include: housing construction, industrial manufacturing, etc.

Cumulative transportation noise could also increase. This ambient noise increase could be related to: aircraft overflights, port noise, ship horns, railroads, as well as freeway, arterial and transit noise.

Mitigation Measures

Mitigation measures intended to reduce the noise impacts on sensitive receptors are part of the 2004 RTP. These include: site design, buffers, soundwalls, etc. Further reduction in noise impacts would be obtained through the implementation of the measures described in **MM 3.5-2a through MM 3.5-2j**.

Significance After Mitigation

Although mitigation measures are recommended for the impact, this may not reduce noise levels to below regulatory levels. Therefore, the impact would be **significant.**

Comparison with the No Project

Through the construction of transportation projects, and increases in traffic volume and speed, the draft 2004 RTP projects may create substantially more noise than the No Project. By not implementing the 2004 RTP (No Project Alternative) the levels of cumulative ambient noise could be substantially less than with the proposed 2004 RTP implementation.

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