4.12 NOISE

This section analyzes the potential noise impacts associated with implementation of the 2050 RTP/SCS. The noise analysis includes a description of existing noise conditions, an evaluation of potential noise impacts associated with construction and operation of projects in the 2050 RTP/SCS, and identification of potentially feasible noise mitigation measures.

4.12.1 EXISTING CONDITIONS

Terminology and Methodology

Noise

The noise measurement terms used in this section include the decibel (dB), which represents the loudness of a noise source; A-weighted decibel (dBA), a frequency weighting method that approximates the range of human hearing; the average noise level over a measured period of time (L_{eq}), typically a 1-hour or 24-hour measurement; and the Community Noise Equivalent Level (CNEL), which assigns a 5-dB "penalty" to noise levels between 7:00 p.m. and 10:00 p.m. and 10-dBA penalty to noise levels between 10:00 p.m. and 7:00 a.m. Neither L_{eq} nor CNEL is an "average" in the normal sense of the word, where introduction of a quiet event would pull down the average. Furthermore, similar to the effect of rainfall in watering a field or garden, scientific evidence strongly indicates that total noise exposure is the truest measure of noise impact. Neither the moment-to-moment rain rate nor the moment-to-moment A-weighted noise level is a good measure of long-term effects (FTA 2006).

Decibels are measured on a logarithmic scale that quantifies sound intensity in a manner similar to the Richter scale used for earthquake magnitudes. Therefore, a doubling of the energy of a noise source, such as doubling of traffic volume, would increase the noise level by 3 dB; a halving of the energy would result in a 3 dB decrease (FHWA 2011). Additionally, human perception of noise has no simple correlation with acoustical energy. The perception of noise is not linear in terms of dBA or in terms of acoustical energy. Two noise sources do not "sound twice as loud" as one source. It is widely published that the average healthy ear can barely perceive changes of 3 dBA, increase or decrease; that a change of 5 dBA is readily perceptible; and that an increase of 10 dBA sounds twice as loud (Caltrans 2009).

Noise levels generated by project construction and operation would be generally described based on common equipment used or reference noise levels and compared against established standards. Both construction and operation noise sources would include stationary and mobile sources, which would attenuate, or reduce, at different rates due to the effects of interference from the ground and atmosphere. Stationary sources are fixed or have a limited area of movement and are generally associated with on-site operations. Stationary, or point, sources attenuate at a rate of 6 dBA per doubling of distance (Crocker 2007). Mobile sources are generally located on long linear paths, such as roadways and railways, which attenuate at a rate of 3 dBA be doubling of distance (FHWA 2011). These attenuation rates assume a hard site condition, such as pavement or water. As this EIR is programmatic in nature, no consideration of additional attenuation for more absorptive, or acoustically soft, intervening terrain, such as a grass or tilled field, is considered.

Construction noise is calculated at the sources and attenuated to locations determined by the standards (e.g., at the nearest residential property line). Construction noise sources include the operation of diesel engines of equipment and vehicles, and various construction activities, both of which can be stationary and mobile. Construction activities typically involve several vehicles and equipment operating at various times within a fixed area and assessed as a stationary source. Construction noise is predicted by

considering the noise rating of the equipment to be used to establish a resultant noise level at 50 feet from the center of the activity. Considering typical duty cycles of this equipment, hourly average noise levels (L_{eq}) are approximated at 50 feet. These noise levels at the source are attenuated with distance at receptors based on source type, ground surface type, and any intervening topography or structures. Given the programmatic nature of this EIR, site-specific construction noise levels are not calculated.

Operational noise sources include stationary sources, e.g.,. mechanical equipment associated with building ventilation, industrial activities, parking lots, etc., and mobile sources, such as traffic or rail. Stationary noise sources are calculated at the source to locations determined by the standards (e.g., at the nearest residential property line). Operation noise of stationary noise sources is predicted by considering the manufacturer's, or measured, sound level of the equipment at a given distance and the typical duty cycles of the equipment (or how continuously the equipment is operated in a given hour) to calculate an L_{eq} at a specific location. These noise levels at the source are attenuated with distance based on ground surface type and any intervening topography and structures to determine the resultant noise level at the nearest property line. Given the programmatic nature of this EIR, project-level operation noise levels from stationary sources are not calculated.

Operation-related mobile noise is calculated from the roadway or railway to locations determined by the standards (e.g., exterior noise-sensitive areas or habitable rooms). Mobile source noise levels are calculated based on traffic speed, traffic volume, and vehicle classification mix. In general, the larger the traffic volume is on a roadway, the higher the noise levels that are generated on that roadway. This holds true until there is so much traffic volume that traffic flow degrades and traffic speeds decrease, which lowers traffic noise levels. This condition is known as the boundary between level of service (LOS) C and D. Thus, the loudest hour traffic noise level increase can be reasonably calculated with a few assumptions, e.g.. the vehicle mix would be similar to the previous condition, the maximum traffic speed would be the same, and the roadway elevation and shielding relative to the local receivers would be similar. Similar to traffic noise, rail noise can be reasonably calculated based on the increase in rail traffic on a given railway; i.e., four trains passing by the same point in the future as two trains pass by today would be approximately 3 dBA louder than the existing train noise. Given the programmatic nature of this EIR, and the lack project-level plans, traffic noise levels are not calculated for specific projects but a range of potential noise level increases is provided to determine the relative level of impact.

Vibration

Vibration levels are usually expressed as a single-number measure of vibration magnitude in terms of velocity or acceleration, which describes the severity of the vibration without the frequency variable. The peak particle velocity (ppv) is defined as the maximum instantaneous positive or negative peak of the vibration signal, usually measured in inches per second. Since it is related to the stresses that are experienced by buildings, ppv is often used in monitoring of blasting vibration. Although ppv is appropriate for evaluating the potential of building damage, it is not suitable for evaluating human response (FTA 2006). This is because it takes some time for the human body to respond to vibrations. In a sense, the human body responds to the average vibration. Vibration is usually measured in inches per second.

Vibrations transmitted through the ground during construction operations may annoy people and detrimentally affect structures and sensitive devices. Where construction vibration does cause structural damage, it is through direct damage and/or vibration-induced settlement. Structural damage depends on the frequency of the vibration at the structure, as well as the condition of the structure and its foundation. Human annoyance by vibration is related to the number and duration of events. The more events or the greater the duration, the more annoying it will be to humans.

There are no state thresholds for construction vibrations; however, the Caltrans considers the architectural damage risk level for continuous vibrations to be a PPV somewhere between 0.1 and 0.5 inches per second while transient sources would potentially result in architectural damage between 0.2 and 2.0; see Table 4.12-1 (Caltrans 2004).

Table 4.12-1
Potential Structural Damage Thresholds

Structure and Condition	Maximum PPV (in/sec)	
	Transient Sources	Continuous/Frequent Intermittent Sources
Extremely fragile historic buildings, ruins, ancient monuments	0.12	0.08
Fragile buildings	0.2	0.1
Historic and some old buildings	0.5	0.25
Older residential structures	0.5	0.3
New residential structures	1.0	0.5
Modern industrial/commercial buildings	2.0	0.5

Note: Transient sources create a single isolated vibration event, such as blasting or drop balls. Continuous/frequent intermittent sources include impact pile drivers, pogo-stick compactors, crack-and-seat equipment, vibratory pile drivers, and vibratory compaction equipment.
Source: Caltrans 2004

Vibrations generated by construction and operations would be generally calculated based on manufacturer's specifications or reference vibration levels, which are compared against established standards. Construction and operation associated with regional growth/land use changes and transportation network improvements would include vibration sources. Construction sources are usually considered temporary and transient, while vibration sources associated with operation of commercial or industrial facilities and transportation facilities are continuous of frequent intermittent sources.

Ambient Noise Levels and Existing Noise Sources

The ambient noise level is the composite of noise from all sources near and far, and represents the normal or existing level of environmental noise at a given location. It is the composite of sound from many sources in all directions with no particular sound being dominant (Harris 1991). Typical ambient levels range from approximately 35 to 50 CNEL in rural and agricultural areas, approximately 50 to 65 CNEL in suburban to urban areas, and approximately 65 to 75 CNEL in downtown urban areas (EPA 1974).

The most prevalent noise generators in the SANDAG region are vehicular and aircraft traffic. Local collector streets are not considered a significant source of noise since traffic volume and speed are generally much lower than for freeways and arterial roadways. Rail and stationary sources associated with industrial and commercial uses also contribute to the noise environment; however, these sources are more localized than traffic and aircraft.

4.12.2 REGULATORY SETTING

Federal noise standards include transportation-related noise sources related to interstate commerce (i.e., aircraft, trains, and trucks) for which there are no more stringent state standards. State noise standards are set for automobiles, light trucks, and motorcycles. Local noise standards are set for industrial, commercial, and construction activities subject to local noise ordinances and general plan policies.

Federal Regulations and Agencies

Federal regulations establish noise limits for medium and heavy trucks (more than 10,000 pounds, gross vehicle weight rating) under 40 Code of Federal Regulations (CFR), Part 205, Subpart B. The federal truck pass-by noise standard is 80 dBA at 15 meters from the vehicle pathway centerline. These controls are implemented through regulatory controls on truck manufacturers.

US Department of Transportation (USDOT)

The USDOT is composed of several agencies and has the primary responsibility to keep the traveling public safe and secure, increase their mobility, and have our transportation system contribute to the nation's economic growth. The USDOT agencies with regulations associated with the RTP include the Federal Highway Administration (FHWA), the Federal Transit Administration (FTA), the Federal Aviation Administration (FAA), and the Federal Rail Administration (FRA).

FHWA

Title 23 Part 772 of the Code of Federal Regulations (23 CFR 772) is the federal regulation governing traffic noise. A Federal or federally-funded project would have a traffic noise impacts if it involved the construction of a new highway, or significant modification of an existing freeway, where the project would result in a substantial operational noise increase, or when the predicted operational noise levels approach or exceed the FHWA Noise Abatement Criteria (NAC). A "substantial increase" is not defined by the FHWA but rather by state agencies. FHWA has developed the NAC for Categories A – G at various noise-sensitive land uses (Federal Register 2010). For example, the FHWA NAC for Category B land uses, which are exterior locations of residences, and Category C land uses, which include active sport areas, amphitheaters, auditoriums, campgrounds, cemeteries, day care centers, hospitals, libraries, medical facilities, parks, picnic areas, places of worship, playgrounds, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, recreation areas, Section 4(f) sites, schools, television studios, trails, and trail crossings., is 67 dBA L_{eq}. Noise levels that approach the NAC are defined as one dBA less than the criterion level, or 66 dBA for Category B and C land uses (Federal Register 2010).

There are no FHWA standards for vibration.

FAA

Aircraft operated in the U.S. are subject to federal requirements for noise emissions levels. The requirements are set forth in Title 14 CFR, Part 36, which 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 FAA established a schedule for complete transition to Part 36 "Stage 3" 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.

The FAA Part 150 program encourages airports to prepare noise exposure maps that show land uses that are incompatible with high noise levels (FICON 1992). The program proposes measures to reduce the incompatibility. With an FAA Part 150 program approved, airport projects such as land acquisition, acoustic treatment of residences, etc., become eligible for Federal AIP funds.

There are no FAA standards for vibration.

FRA and FTA

The Federal Railroad Noise Emission Compliance Regulation (49 C.F.R. Part 210) prescribes minimum compliance regulations for enforcement of the railroad noise emission standards adopted by the EPA (40 C.F.R. Part 201). The FTA has also established criteria for assessment of noise and vibration impacts for high-speed ground transportation projects (FTA 2006). The FRA has adopted the FTA methodologies and significance criteria for the evaluation of noise impacts from surface transportation modes. These have applicability to noise from motor vehicle traffic, such as buses, on local roadway that the 2050 RTP/SCS would generate, as well as train noise, and as to how the noise might be judged in relation to the existing and future background noise. The FTA and FRA incremental noise impact criteria are summarized in Table 4.12-2.

Table 4.12-2
Noise Impact Criteria for Noise-Sensitive Uses (dBA)

	For Land Use Categories 1 & 2			For Land Use Category 3		
Existing Noise Level	Project Impact Threshold	Combined Noise Level	Allowable Noise Increment	Project Impact Threshold	Combined Noise Level	Allowable Noise Increment
55	55	58	3	60	61	6
60	58	62	2	63	65	5
65	61	66	1	66	68	3
70	64	71	1	69	73	3
75	65	75	0	70	76	1

Notes:
Land Use Category 1: Tracts of land where quiet is an essential element in their intended purposes. This category includes lands set aside for serenity and quiet, and such land uses as outdoor amphitheaters and concert pavilions, as well as National Historic Landmarks with significant outdoor uses. Also included are recording studios and concert halls. The noise metric for Category 1 is the outdoor 1-hour L_{eq} during the noisiest hour of activity.
Land Use Category 2: Residences and buildings where people normally sleep. This category includes homes, hospitals and hotels where a nighttime sensitivity to noise is assumed to be of utmost importance. The noise metric for Category 2 is the outdoor L_{eq} or CNEL.
Land Use Category 3: Institutional land uses with primarily daytime and evening uses. This category includes schools, libraries, theaters, churches where it is important to avoid interference with such activities as speech, meditation and concentration on reading material. Places for meditation or study associated with cemeteries, monuments, museums, campgrounds and recreational facilities can also be considered in this category. Certain historical sites and parks are also included. The noise metric for Category 3 is the outdoor 1-hour L_{eq} during the noisiest hour of activity.
Source: FAA 2006

FTA uses hourly L_{eq} as the measure of total noise impact for non-residential land uses (those not involving sleep) because: (1) L_{eq}'s correlate well with speech interference in conversation and on the telephone – as well as interruption of TV, radio and music enjoyment, (2) L_{eq} 's increase with the duration of noise events, which is important to people's reaction, (3) L_{eq} 's take into account the number of events over the hour, which is also important to people's reaction, and (4) L_{eq} 's are used by the Federal Highway Administration in assessing highway-traffic noise impact (FTA 2006). Thus, this noise descriptor can be used for comparing and contrasting various noise sources, such as automobile and trains. L_{eq} is computed for the loudest hour during noise-sensitive activity at each particular non-residential land use.

FTA uses CNEL as the measure of total noise impact for residential land uses and those involving sleep, because: (1) CNEL correlates well with the results of attitudinal surveys of residential noise impact; (2) CNEL's increase with the duration of events; (3) CNEL's take into account the number of events over a 24-hour period, which is important in evaluating total exposure; (4) CNEL's take into account the increased sensitivity to noise during the evening and night; (5) CNEL's allow composite measurements to capture all sources of community noise combined; (6) CNEL's allow quantitative comparison of specific

noise sources with other community noises; and (7) CNEL is the designated metric of choice for airport planning and community planning, and also has wide acceptance internationally (FTA 2006).

The FTA also provides guidance for evaluating construction noise in environmental documents. According the to the FTA "[p]roject construction noise criteria should take into account the existing noise environment, the absolute noise levels during construction activities, the duration of the construction, and the adjacent land use" (FTA 2006). While the FTA does not specify standardized criteria for construction noise impact, the guidelines presented in Table 4.12-3 are considered reasonable criteria for construction noise when little project-level information is available. Additionally, the FTA considers a 10 dBA increase in high ambient noise levels a substantial temporary increase in noise levels. There is no guidance for a temporary substantial increase in noise levels in rural or quiet areas.

Table 4.12-3
Construction Noise Criteria

Land Use	1-hour L_{eq} (dBA)		8-hour L_{eq} (dBA)	
	Day	Night	Day	Night
Residential	90	80	80	70
Commercial	100	100	85	85
Industrial	100	100	90	90

Note: In urban areas with very high ambient noise levels, construction operations should not exceed existing ambient + 10 dB.
Source: FTA 2006

The FRA and FTA have published guidance relative to vibration impacts. According to the FTA, fragile buildings can be exposed to groundborne vibration levels of 0.5 PPV without experiencing structural damage (FTA 2006). The FTA and FRA have identified the human annoyance response to vibration levels from train operations as 80 VdB (FTA 2006).

State Regulations and Agencies

State of California

Noise Insulation Standard

The California Noise Insulation Standards found in the California Code of Regulations, Title 24, set requirements for new residential units, hotels, and motels that may be subject to relatively high levels of transportation-related noise. For areas with exterior noise levels greater than 60 dBA, the noise insulation standard is 45 dBA in any habitable room; an acoustical analysis demonstrating how dwelling units have been designed to meet this interior standard is required where such units are proposed in such areas. From Title 24, California Code of Regulations (CCR), Part 2, Section 1207.11.2, "The noise metric must be either the day-night average sound level (Ldn) or the community noise equivalent level (CNEL), consistent with the noise element of the local general plan

California Department of Transportation (Caltrans)

Caltrans manages California's highways and freeways, provides inter-city rail services, and permits public-use airports and special-use hospital heliports. The Caltrans has programs and divisions with policies or regulations associated with the RTP including Aeronautics, Highway Transportation, Rail, and Mass Transportation.

Sections 27201-27206 of the California Vehicle Code sets noise limits for vehicles licensed to operate on public roads. For heavy trucks, the State standard is consistent with the federal limit of 80 dBA. The State

passby standard for motorcycles, passenger cars, and light trucks is also a maximum of 80 dBA at 50 feet from the centerline. For roadway projects, Caltrans uses the FHWA NAC and sets the substantial increase criterion at 12 dBA L_{eq} (Caltrans 2011a). Additionally, construction noise from a contractor's operations, between the hours of 9:00 p.m. and 6:00 a.m., must not exceed 86 dBA at a distance of 50 feet.

The California Airport Noise Standards (Title 21 CCR Section 5000 et seq.) apply to any airport that is determined to have a noise problem by the local County Board of Supervisors. At this time, San Diego International Airport is the only airport in within the jurisdiction of SANDAG that has been determined to have a noise problem (Caltrans 2011b). Title 21 CCR Section 5006, states "[t]he level of noise acceptable to a reasonable person residing in the vicinity of an airport is established as a community noise equivalent level (CNEL) value of 65 dB for purposes of these regulations." Section 5012 sets 65 dBA CNEL as the acceptable level standard. The Caltrans Division of Aeronautics is responsible for licensing and permitting programs for airports and heliports. Assistance for the development and maintenance of aviation facilities through engineering and aviation experience is also provided, as well as systems planning and environmental and community service programs (Caltrans 2002b).

Caltrans Division of Rail uses FRA and FTA noise criteria and methodologies for assessing rail related noise or vibration impacts.

Local Plans and Policies

General Plan Noise Elements

Cities and the County within SANDAG's region adopt a noise element as part of their General Plan to identify, appraise, and remedy noise problems in local communities. Noise elements 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 federal standards, local jurisdictions may to adopt their own noise goals and policies in their noise elements, or adopt noise/land use compatibility guidelines similar to those recommended by the State, see Table 4.12-4. With the exception of two cities, Del Mar and Oceanside, all other jurisdictions have adopted land use and noise compatibility goals similar to Table 4.12-4. Neither Del Mar nor Oceanside have published noise level and land use goals.

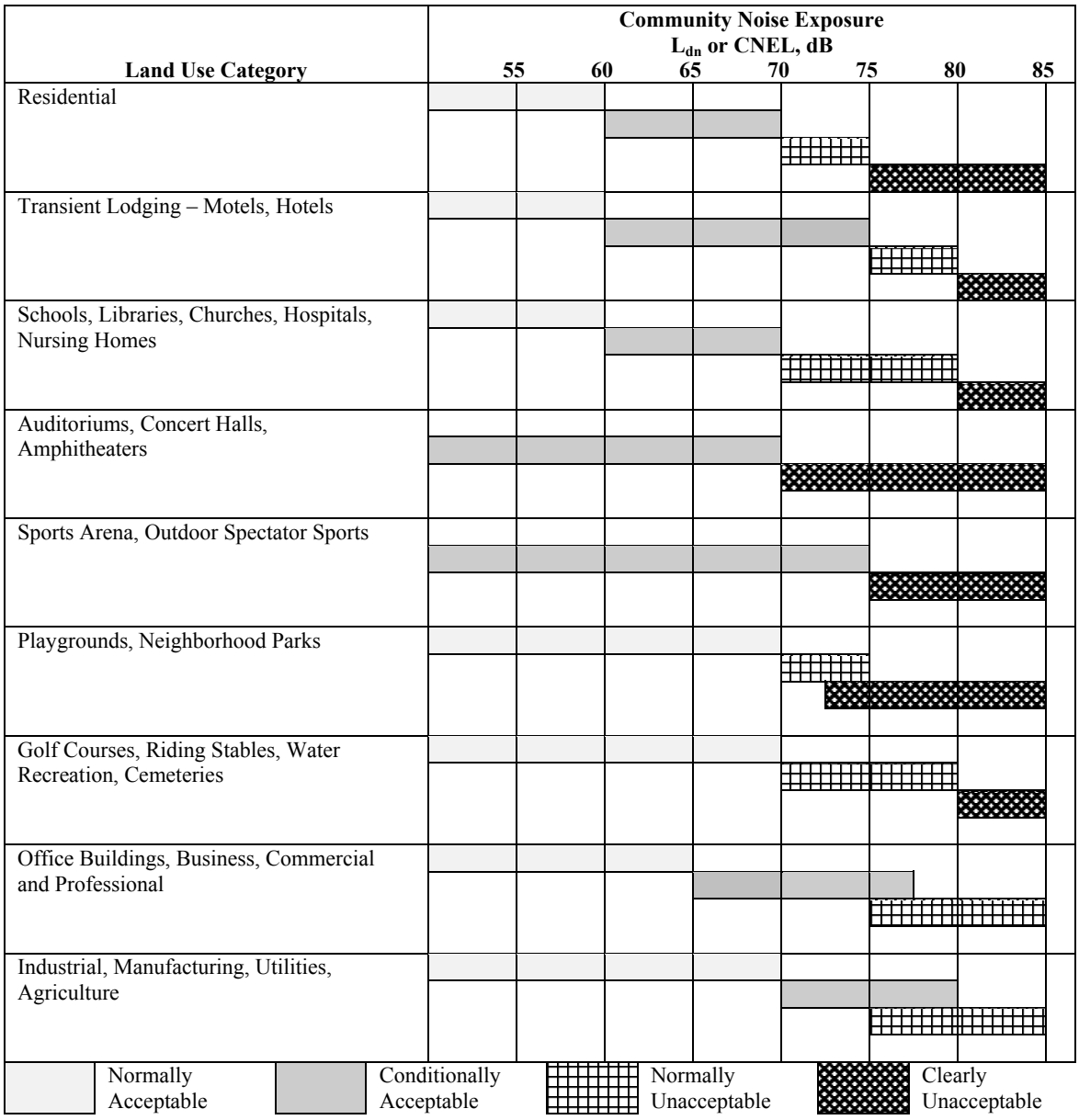
Noise Ordinances

In addition to general plan noise element policies, local jurisdictions regulate specific noise sources through enforcement of local ordinance standards in their municipal codes including noisy activities (e.g., loudspeakers, construction noise, and stationary noise sources and facilities (e.g., air conditioning units and industrial activities). Table 4.12-5 summarizes the various property line noise limits and Table 4.12-6 summarizes the construction noise regulations for each jurisdiction within the SANDAG region.

Airport Land Use Commissions

In the SANDAG region, the relationships of transportation, transit, and mobility, and of population growth to noise associated with aircraft in flight are the responsibility of the San Diego County Regional Airport Authority, established under state law to protect the safety and welfare of the general public and the ability of airports to operate now and in the future (SDCRAA 2011). One of the Authority's responsibilities is to serve as the Airport Land Use Commission (ALUC) for San Diego County. The ALUC is charged with creating or updating Airport Land Use Compatibility Plans (ALUCP) for the region's 16 public-use and military airports in accordance with applicable state and federal laws.

Table 4.12-4
Noise/Land Use Compatibility Guidelines



Normally Acceptable	Conditionally Acceptable	Normally Unacceptable	Clearly Unacceptable
Specified land use is satisfactory based upon the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements.	New construction or development should be undertaken only after a detailed analysis of the noise reduction requirement 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.	New construction or development should generally 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.	New construction or development should generally not be undertaken.

Source: OPR 2003

Table 4.12-5
Summary of Applicable Property Line Noise Level Limits

Jurisdiction	General Land Use Zone					
	Residential		Commercial		Industrial	
	Daytime	Nighttime	Daytime	Nighttime	Daytime	Nighttime
Carlsbad	--	--	--	--	--	--
Chula Vista	--	--	--	--	--	--
Coronado	50-55	40-45	60	50	--	--
Del Mar	50	40	60	50	--	--
El Cajon	60	50	65	55	75	75
Encinitas	50-55	45-50	60	55	60	55
Escondido	50-55	45-50	60	55	70-75	70-75
Imperial Beach	--	--	--	--	--	--
La Mesa	55-60	50-55	65	60	70	70
Lemon Grove	50-60	40-50	60	55	70	70
National City	45-50	55-60	60	65	70-80	70-80
Oceanside	50-55	45-50	65	60	70	65
Poway	50-55	40-50	60	55	70	70
San Diego, City	50-60	40-50	65	60	75	75
San Diego, County	50-55	45-50	60	55	70-75	70-75
San Marcos	--	--	--	--	--	--
Santee	50-55	40-45	60	50	70-75	70-75
Solana Beach	50-55	45	60	55	70	60
Vista	50-55	45-50	60	55	75	75

Source: Data compiled by AECOM 2011

Table 4.12-6
Summary of Applicable Construction Noise Standards

Jurisdiction	Code Section	Construction Hours Prohibited	Construction Noise Limits
Carlsbad	8.48	After sunset any day; before 7:00 a.m. weekdays; before 8:00 a.m. Saturday; Sundays; seven holidays	75dBA L_{eq}
Chula Vista	17.24	10:00 p.m. - 7:00 a.m., Monday through Friday, and before 8:00 a.m. or after 10:00 p.m. Saturdays, Sundays	None
Coronado	41.10	7:00 p.m. – 7:00 a.m. Monday through Saturday; Sundays; legal holidays	75 dBA L_{eq}
Del Mar	9.20	7:00 p.m. - 7:00 a.m., Monday through Friday, and before 9:00 a.m. or after 7:00 p.m. Saturdays, Sundays; holidays	75 dBA L_{eq} at residential properties
El Cajon	17.115	7:00 p.m. – 7:00 a.m., within 500 feet of residential uses	None
Encinitas	9.32	7:00 p.m. – 7:00 a.m. Monday through Friday; Sundays; federal holidays	75 dBA $L_{eq(8)}$ at residential properties
Escondido	17-234	6:00 p.m. - 7:00 a.m., Monday through Friday, before 9:00 a.m. or after 5:00 p.m. Saturdays, Sundays	75 dBA L_{eq} at residential properties
Imperial Beach	9.32	10:00 p.m.-7:00 a.m.[IB]	75 dBA L_{eq}
La Mesa	10.80	10:00 p.m.-7:00 a.m.; Sundays	None
Lemon Grove	9.24	7:00 p.m. – 7:00 a.m. Monday through Saturday	75 dBA $L_{eq(8)}$ at residential properties
National City	12.10	6:00 p.m.-7:00 a.m. weekdays; weekends; federal holidays	75 dBA L_{eq} at residential properties, and 85 dBA L_{eq} at commercial properties
Oceanside	515	6:00 p.m.-7:00 a.m. weekdays; weekends; Federal holidays [O]	
Poway	8.80	5:00 p.m.- 7:00 a.m. Monday through Saturday; Sundays; federal holidays	75 dBA $L_{eq(8)}$ at residential properties
San Diego, City	59.5	7:00 a.m. – 7:00 p.m. Monday through Saturday; Sundays; federal holidays	75 dBA L_{eq}
San Diego, County	36.40	7:00 a.m. – 7:00 p.m. Monday through Saturday; Sundays; federal holidays	75 dBA $L_{eq(8)}$ at residential properties
San Marcos	10.24	6:00 p.m. - 7:00 a.m. Monday through Friday, before 8:00 a.m. or after 5:00 p.m. Saturdays, Sundays	
Santee	8.12	7:00 p.m. – 7:00 a.m. Monday through Saturday	75 dBA $L_{eq(8)}$ at residential properties
Solana Beach	7.34	7:00 p.m.-7:00 a.m. weekdays; 7:00 p.m.-8:00 a.m. Saturday; Sundays; nine holidays[SB]	75 dBA $L_{eq(8)}$ at residential properties
Vista	NA	None	None

Source: Data compiled by AECOM 2011

ALUCPs have been adopted for 14 of the 16 public use or military airports in the region. Those airports, with the year of adoption of the latest ALUCP, are:

- Agua Caliente Airport (2006)
- Borrego Valley Airport (2006)
- Brown Field (2010)
- Fallbrook Community Airpark (2006)
- Gillespie Field (2010)
- Jacumba Airport (2006)
- Marine Corps Air Station Camp Pendleton (2008)
- Marine Corps Air Station Miramar (2010)
- McClellan-Palomar Airport (2010)
- Montgomery Field (2010)
- Oceanside Municipal Airport (2010)
- Ocotillo Airport (2006)
- Ramona Airport (2008)
- San Diego International Airport - Lindbergh Field (2004)

The two airports that do not have ALUCPs are both military airfields: the Navy's Outlying Landing Field Imperial Beach and Naval Air Station North Island. The Department of Defense requires military airfields to adopt Air Installation Compatible Use Zone (AICUZ) studies, which assess compatible land uses in the vicinity of a military air station in a way equivalent to ALUCPs.

The ALUC reviews land use plans, development proposals, and certain airport development plans for consistency with adopted ALUCPs. An ALUCP focuses on a defined area around each airport known as the Airport Influence Area (AIA). The AIA is composed of noise, safety, airspace protection, and overflight factors, in accordance with guidance from the California Airport Land Use Planning Handbook published by Caltrans, Division of Aeronautics. ALUCPs provide guidance on appropriate land uses surrounding airports to protect the health and safety of people and property within the vicinity of an airport, as well as the public in general. While, the ALUC has no jurisdiction over the operation of airports or over existing land uses, regardless of whether such uses are incompatible with airport activities, within 180 days of an ALUCP being adopted by the ALUC, local agencies with land located within the AIA boundary for any of the airports must, by law, amend their planning documents to conform to the applicable ALUCP. If a local agency fails to take either action, it is required to submit all land use development actions involving property within the AIA to the ALUC for review. The local agency may propose to overrule an ALUC's compatibility plan by a two-thirds vote of its governing body if it makes specific findings at a hearing that the local agency's plans are consistent with the intent of state airport land use planning statutes. The local agency must provide both the ALUC and the California Division of Aeronautics the opportunity to provide comments to the local agency, which must be included in the public record of the local agency's final decision to overrule the ALUC. Similar requirements apply to a local agency's decision to overrule the ALUC's consistency determinations for individual development proposals in an ALUCP and Airport Master Plan (Pub. Util. Code § 21676 et seq.).

The four compatibility factors considered in an ALUCP are noise, safety, airspace protection, and overflight. However, only noise is covered in this section. The purpose of noise being included in the ALUCP is to "avoid introducing new noise-sensitive land uses in the vicinity of an airport that would be exposed to significant levels of aircraft noise, taking into account the characteristics of the airport and the communities surrounding the airport." While airport noise may be addressed by altering runway use through flight routing changes, aircraft operational procedure changes, and engine run-up restrictions, these actions generally are subject to approval by the FAA, which has the authority and responsibility to

control aircraft noise sources, implement and enforce flight operational procedures, and manage the air traffic control system.

In addition to the public or military airports, there are numerous private airports, airstrips, and helipads in the region. Many of these private airports are located in the eastern areas of the region or remote vacation destinations. There are several private helipads located on the roofs of hospitals and buildings owned by large corporations, or used by police stations. The majority of these private airports do not have adopted an ALUCP or CLUP.

4.12.3 SIGNIFICANCE CRITERIA

The 2050 RTP/SCS would have a significant impact on noise if implementation were to:

N-1 Expose 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.

N-2 Expose persons to or generation of excessive groundborne vibration or groundborne noise levels.

N-3 Cause a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project.

N-4 Cause a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.

N-5 For a project located within an airport land use plan or where such a plan has not been adopted within 2 miles of a public airport or public use airport, expose people residing or working in the project area to excessive noise levels.

N-6 For a project within the vicinity of a private airstrip, expose people residing or working in the project area to excessive noise levels.

4.12.4 IMPACT ANALYSIS

Noise Analysis Methodology

This section analyzes the impacts associated with the implementation of the 2050 RTP/SCS. This analysis focuses on the main components of the 2050 RTP/SCS that would affect noise—regional growth and transportation system improvements. The method to assess noise impacts of the 2050 RTP/SCS is to review the projected growth and review the list of transportation improvements, then assess the likelihood of significant noise impacts based on the type of project (e.g., roadway expansion, new railway, etc.), location, and land uses surrounding the project. Analysis of significance criteria includes a program-level discussion of anticipated impacts in the planning horizon years of 2020, 2035, and 2050. Significant impacts are identified and mitigation measures are provided where appropriate.

Regional Growth/ Land Use Change

Development projects implemented under the 2050 RTP/SCS would include residential uses located in proximity to commercial uses and in areas served by public transit along major roadways. Development projects implementing the growth forecast would generate noise during construction and operation. Additionally, new residential and mixed-use development that would occur with implementation of the

2050 RTP/SCS would potentially be constructed within the same building as commercial uses or adjacent to incompatible land uses, such as commercial or industrial land uses.

Noise sources associated with commercial and industrial land uses include mechanical equipment, public address systems, parking lot noise (e.g., opening and closing of vehicle doors, people talking, car alarms), delivery activities (e.g., use of forklifts, hydraulic lifts), trash compactors, and air compressors. Noise from such equipment can reach intermittent levels of approximately 90 dBA, 50 feet from the source (USEPA 1974).

Transportation Network Improvements

Traffic Noise

The traffic noise generated on a roadway is dependent on traffic speed, volume, and percentage of trucks. In general, the larger the traffic volume is on a roadway, the higher the noise levels that are generated on that roadway. This holds true until there is so much traffic volume that traffic flow degrades and traffic speeds decrease, which lowers traffic noise levels. Roadways with large percentages of heavy trucks will generate higher noise levels. A heavy truck traveling 50 mph generates about 85 dBA, whereas an automobile traveling the same speed generates only 71 dBA. An increase of 10 dBA is usually perceived as a "doubling" of sound (FHWA 2011).

Roadways that generate the highest noise levels in the region are the interstate and state highways as they have the highest speed limits, the largest traffic volumes, and the most trucks. Figure 2.0-1, Regional Setting, shows the interstate and state highway network and significant arterials in the SANDAG region. Traffic typically generates 70–80 dBA CNEL at 50 to 100 feet of major highways. Heavily used commuter roadways, such as arterials and major streets, also generate significant levels of noise, typically 65–75 dBA CNEL at similar distances (FTA 2006). In the SANDAG region, there is a wide range of land uses located adjacent to highways and major streets, including residences, schools, churches, hospitals, shopping centers, industrial parks, agriculture, parks, and open space. A general rule for estimating noise reductions due to intervening structures in populated areas is to assume one row of buildings every 100 feet and apply -4.5 dBA for the first row and -1.5 dBA for every subsequent row, up to a maximum of -10 dBA attenuation (FTA 2006). Thus, traffic noise is not usually a serious problem for people who live more than 500 feet from heavily traveled freeways or more than 100 to 200 feet from lightly traveled roads (FHWA 1992).

Railroad Operations

The two basic types of railroad operations are freight trains and passenger rail operations, the latter consisting of commuter and intercity passenger trains and steel-wheel urban rail transit. Generally, freight operations occur at all hours of the day and night while passenger rail operations are concentrated within the daytime and evening periods. For example, the operating window for freight service on the San Diego Trolley Blue Line is from 2:00 a.m. to 4:00 a.m., Sunday through Friday. On Saturday, light rail service is operated throughout the 24-hour period with late night service at 30-minute intervals; freight service is not permitted.

Trains can generate high, relatively brief, intermittent noise events. Train noise is 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 generate the primary source of 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. Railways carrying 5–10 trains per day at speeds of 30–40 mph typically generate 60—65 CNEL at 60–120 feet from the

center of the railway (FTA 2006). The sounding of train air horns and crossing gate bells also contributes to higher noise levels near rail/roadway grade crossings and can result in noise impacts within 1,200 feet of the crossing (FTA 2006). In the SANDAG region, there is a wide range of land uses located adjacent to railways, including residences, schools, churches, hospitals, shopping centers, industrial parks, agriculture, parks, and open space. The same general rule for estimating noise reductions due to intervening structures in populated areas is applicable to rail noise as well (FTA 2006). Based on these concepts, commuter rail is not usually an issue beyond 375 feet, while light rail is usually not a problem beyond 175 feet (FTA 2006).

Construction

Construction projects typically generate noise levels on the order of 84–89 dBA L_{eq} at 50 feet from the center of the activity during construction. Impacts to sensitive receptors resulting from these construction projects would depend on several factors, such as the type of project for the given area, land use of the given area, and duration of construction activities. Additionally, construction noise levels would fluctuate depending on construction phase, and equipment type and duration of use; distance between noise source and receptor; and presence or absence of barriers between noise source and receptor.

Potential noise impacts are assessed for the target years of 2020, 2035, and 2050 in the following sections.

N-1 EXPOSE 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

Noise levels generated by construction and operation activities associated with 2050 RTP/SCS implementation would be considered significant if they exceeded established standards of Caltrans or local jurisdictions. Transportation noise sources to be considered within the SANDAG region include airports, freeways, arterial roadways, seaports, and railroads.

Short-term noise impacts associated with construction of 2050 RTP/SCS projects could expose persons to, or generate noise levels in excess of, standards established in the local general plan or noise ordinance, or applicable standards of other agencies. Please see Impact N-4, below, for a detailed analysis of construction noise.

2020

Regional Growth/Land Use Change

By 2020, population within the region is expected to increase by 310,568 people; housing by 113,062 units; and employment by 118,535 jobs. The 2050 RTP/SCS describes a land use pattern for the region to accommodate growth as well as protecting sensitive habitats and resource areas while providing transportation network improvements necessary to serve the mobility needs of the growing population. To accomplish this, the 2050 RTP/SCS land use pattern focuses housing and jobs growth in existing urbanized areas, protects sensitive habitat and open space, and invests in a transportation network that provides residents and workers with alternatives to driving. Under the 2050 RTP/SCS new development by 2020 would be more compact and more accessible to public transit.

When comparing existing land use as shown in Figure 4.11-1 and 2020 land use as shown in Figure 4.11-3, there are no substantial differences in the land use patterns, types, or areas of development. Similarly, when comparing existing population and employment as shown in Figures 4.13-1 and 4.13-3,

respectively, with the 2020 population and employment patterns as shown in Figure 4.13-5 and 4.13-6, respectively, there are no substantial differences in the population levels or employment centers. The figures show that the land use changes, and population and employment patterns that would occur throughout the SANDAG region within the next 10 years would not create substantial changes to the existing regional land use patterns or developed areas. Some locations that would experience the most extensive growth and land use change by 2020 would include areas such as eastern Chula Vista along the SR 125 and I-805 corridors; San Diego community planning areas of San Ysidro and Otay Mesa along the SR 905 corridor; City of San Diego coastal and bay communities south of I-8 including Ocean Beach and the Peninsula planning areas; portions of northern Santee; areas north and south of the SR 56 corridor in the San Diego planning areas of Carmel Valley, Del Mar Mesa, Pacific Highlands Ranch, and Torrey Highlands; the San Marcos area near both the SR 78 and I-15 corridors; and within unincorporated County communities such as Fallbrook, Pala-Pauma Valley, and Valley Center along the I-15 and SR 76 corridors.

While development patterns indicate there are no substantial differences in regional land use patterns, types, or areas of development, the increase in population, housing, and employment development expected by 2020 would result in impacts to noise through conflicts in land use, such as placing residential uses next to commercial or industrial uses or locating noise-sensitive land uses within the 60–65 dBA CNEL contour of airports or roadways. Thus, depending on the project specifics, stationary noise sources associated with future development projects may impact adjacent land uses, and noise-sensitive land uses could be located in incompatible noise environments. While development projects would be required to comply with all applicable noise regulations, which would limit noise impact between land uses and promote land use compatibility, there is no guarantee that noise impacts would be less than significant for all projects. Thus, while adherence to the existing laws, regulations, and programs discussed in Section 4.12.2 would reduce noise impacts upon implementation of the 2050 RTP/SCS, there is no assurance that adherence would reduce these impacts to a less than significant level. The 2050 RTP/SCS is a program-level document; detailed, site-specific information is not available to predict either the site-specific noise impacts of future land use changes, or the effectiveness of existing laws, regulations, and programs in reducing any such site-specific impacts. This is a significant impact.

Transportation Network Improvements

The transportation network improvements that would be implemented between 2010 and 2020 generally include widening and/or installation of HOV lanes, ~~and~~ Managed Lanes, and Transit Lanes along portions of I-5, I-15, I-805, SR 78, and SR 94; completion of SR 905 and SR 11; and HOV connector projects along I-805 and SR 78 at I-15. Year 2020 highway improvement projects are identified in Table 2.0-5 and shown in Figure 2.0-15. Some key transit network improvements in place by 2020 would include increases in existing COASTER service, including extension of COASTER service to the San Diego Convention Center and Petco Park. BRT downtown express services from inland and south bay locations would be expanded as well as new BRT routes from the south bay area and along I-15. Rapid bus service would add new routes and streetcar routes would be established. Airport express routes would also be developed. Local bus service would be improved to 15 minutes in key corridors. Double-tracking of the LOSSAN rail corridor would occur to accommodate increased frequency in COASTER and other rail services that utilize this rail line. In addition, the new Mid-Coast Trolley line from Old Town to University Town Center would be constructed and the Green Trolley line would be extended to downtown San Diego. Year 2020 transit projects are identified in Table 2.0-5, and the locations are shown in 2.0-11.

The noise impacts of the transportation improvements described in the 2050 RTP/SCS would generally be adverse as the improvements would increase noise levels adjacent to transportation network improvements. This is primarily the result of predicted regional population and employment growth and

the associated increases in the number of trucks, buses, and trains operating under the 2050 RTC/SCS, which generate greater noise per vehicle than automobiles (Caltrans 2009).

In addition, decreasing congestion, a goal of the 2050 RTP/SCS, would in general allow vehicular traffic on freeways and major arterials to move faster, so that fewer vehicles using a corridor could potentially increase the noise produced by traffic along a given corridor as an increase of 10 mph is required to achieve a 3 dBA increase. Additionally, increases in average daily traffic volumes would have little effect on loudest hour noise levels as the greatest noise occurs when a roadway or freeway is operating at a maximum level of service (LOS C). LOS is characterized by the maximum number of vehicles operating on a roadway or freeway while traveling at the maximum allowable speed. For a freeway with limited access this value is typically 1,900 vehicles per lane per hour; surface streets and highways are generally closer to 1,000 to 1,500 vehicles per lane per hour due to the presence of traffic signals and vehicles entering and exiting the thoroughfare. Thus, while the loudest hour is unlikely to change substantially, the overall exposure to noise levels equal to the loudest hour would increase, which would increase the CNEL in proximity to freeways and major arterials.

Additionally, while expanded transit services in 2020 are expected to accommodate greater ridership in the future, this would have little effect relative to traffic on freeways and major arterials due to increases in the overall increase in population, which would result in an increase in overall vehicle miles traveled (VMT), in thousands, of approximately 8,~~169~~154, or 10.5 percent (~~2050 RTC/SCS~~ Appendix B). VMT has a direct correlation to increases in traffic volumes; therefore, the 10.5 percent increase would not likely result in a significant increase in noise levels from the freeways or major arterials. As indicated, increases in traffic volumes are not expected to result in significant increases in noise levels along heavily traveled corridors, such as the I-5, I-805, and I-15, as a doubling of vehicle volumes would be required to generate a 3 dBA increase on existing alignments (Caltrans 2009). While, reductions in traffic congestion could lead to slight increases in noise as peak-hour traffic speeds increase, these would be barely perceivable, i.e., 3 dBA or less. Thus, the forecasted 2020 improvements are unlikely to result in a substantial increase in ambient noise levels from increases in traffic volumes or changes in traffic speeds. However, the proposed transportation network improvements could potentially move traffic closer to local receptors or change existing shielding, or result in higher truck percentages, which would result in a substantial increase in noise levels at local noise-sensitive receptors.

Improvements and extension of transit corridors, specifically associated with rail activity, could expose existing and future noise-sensitive land uses to the higher levels of noise generated by high-volume transit corridors. Noise levels would increase along rail corridors where speeds are increased, trains are double-tracked, or in new rail corridors where there were previously no trains. Increased noise levels would only be relevant where adjacent sensitive receivers are located along existing or proposed rail corridors. Rail crossings also use audible warning signals that could impact nearby residents. Increases in rail traffic could also lead to more train horns or whistles at crossings near residential areas, which can be a source of annoyance, especially at night or in early morning or evening.

The 2050 RTP/SCS includes actions that encourage more efficient intermodal transportation of goods. The number of freight trains currently operating each day in the SANDAG region is dependent upon the demands of the industries using rail services and can vary greatly from day to day. Currently, BN&SF and the San Diego and Imperial Valley (SDIV) railroads transport rail freight in the SANDAG region. Under an agreement made as a part of the purchase of 82 miles of BN&SF right-of-way within the SANDAG region, BN&SF maintains a freight easement over the 62 miles of coastal mainline and the 20-mile branch line between Escondido and Oceanside. The BN&SF also interchanges freight with the SDIV and with the U.S. Navy. Currently, the BN&SF runs approximately four freight trains per day between San Diego and the Greater Los Angeles area (two in each direction). The 2050 RTP/SCS includes proposed rail capacity improvements to reduce current passenger/freight rail bottlenecks and increase capacity for

existing port- and border-related freight. While increases in rail transit tonnage would increase the number of freight trains, these trains would likely operate on an as-needed basis and would not have a fixed schedule. Therefore, noise levels and frequency of passbys would continue to vary greatly from day to day. On some days there may be no increase in freight train activity. Specific 2020 improvements call for double-tracking COASTER routes and other extensions of commuter rail service that would be impacted by intermodal rail operations. Overall, however, an increase in train traffic would yield a consequent increase in noise and vibration in areas adjacent to rail corridors.

At the regional scale, the 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 or result in a substantial noise level increase when they occur in proximity to noise-sensitive receptors. Table 4.12-7 summarizes proposed new and expanded facilities with potential noise impacts, including highway, freeway, rail transit, tollway, truck lanes, and freeway interchange projects. Table 2.0-5 lists specific year 2020 transit improvements and Tables 2.0-6 and 2.0-7 list specific year 2020 roadway projects under the 2050 RTP/SCS.

Construction noise, analyzed in detail in Impact N-4, is also regulated by local noise ordinances. Nonetheless, construction of transportation network improvements in the 2050 RTP/SCS could exceed noise level limits of local noise ordinances. Thus, construction noise from transportation network improvements is considered a significant impact.

Based on the preceding analysis, potential noise impacts due to proposed transportation improvements would occur; however, potential impacts would be site specific and the required precision of information to determine site-specific impacts and mitigation is greater than available at this time. Thus, each of the projects included in the 2050 RTP/SCS would require independent evaluation at the project level. As the 2050 RTP/SCS is a program-level document, detailed, site-specific information is not available to predict either the site-specific noise impacts of future land use changes, or the effectiveness of future measures in reducing any such site-specific impacts. Thus, while project-level analysis would be required and site-specific measures to reduce noise impacts would be required upon implementation of the 2050 RTP/SCS, there is no assurance that the noise impacts would be reduced to a less than significant level. Therefore, this is a significant impact.

Conclusion

By 2020, land use changes associated with growth forecasted in the 2050 RTP/SCS could locate noise-sensitive land uses in areas with noise levels in excess of local standards.

Transportation network improvements involving simple capacity expansions or extension of transit services along existing alignments are not anticipated to substantially increase noise levels over the existing condition, but some improvements would expose adjacent land uses to noise levels in excess of local or Caltrans standards due to the movement of traffic closer to receivers. The development of new transit facilities where none currently exist would likely result in substantial noise level increases and could expose noise-sensitive receptors to noise levels in excess of local standards.

Therefore, the 2050 RTP/SCS would result in significant noise impacts in 2020 because both growth/land use changes and transportation network improvements would expose persons to or generate noise levels in excess of local or Caltrans standards. This is a significant impact for which mitigation measures are described in Section 4.2.5.

Table 4.12-7
2050 RTP/SCS - 2020, 2035, and 2050 Improvements and Associated Noise Impacts

Corridor/Improvement Type	Noise Sources	$L_{eq(h)}$ Noise Level at 100 feet[1]	Potential Impacts
Freeway/Highway/ Roadways	Motor Vehicles	65–75 dB (Highways/Roadways) 70–80 dB (Freeways)	Noise levels from roadways (especially interstates) already exceed local standards in most locations in the SANDAG region (SANDAG 2007). Transportation improvements would not generate traffic directly; however, traffic is generated from increased population of which improvements can have positive, negative, or no effect on how that population uses motor vehicles. While the project includes some improvements to move motor vehicle traffic onto transit sources, the expansion of roadways for additional standard and managed lanes would potentially result in increases in traffic volumes and resulting increases in noise levels in proximity to the corridors where improvements occur. Additionally, some of the improvements would move traffic closer to sensitive receptors, change existing shielding, or develop new transportation facilities in areas where none exist, which could result in substantial increases in noise levels at those locations when compared to baseline conditions. Maximum noise level increase associated with expansion projects would typically be 2 dBA, with the exception of projects that double the capacity of a roadway, such as the SR 76 expansion, or the development of new roadways where noise levels could be increased over existing noise levels by as much as 12 dBA.
Commuter Rail/ SPRINTER/COASTER	Trains	60–65 dB	The 2050 RTP/SCS proposes extending COASTER operations into downtown, extending SPRINTER operations into South Escondido and increasing COASTER and SPRINTER services through double-tracking during on- and off-peak hours to increase service reliability and speed. Any doubling of COASTER service would likely result in substantial increase in ambient noise in the surrounding area. In addition, it is likely that in many areas the COASTER is already close to, or exceeding noise standards.
Light Rail/ Trolley/Streetcar	Trains	60–63 dB	The 2050 RTP/SCS proposes increased light rail service for the Blue, Orange, and Green lines; and extending operations throughout the County. Any doubling of light rail service would likely result in substantial increase in ambient noise in the surrounding area. In addition, it is likely that in many areas the light rail system is already close to, or exceeding noise standards. -+
Bus Rapid Transit/Rapid	Buses	60 dB	The 2050 RTC/SCS proposes increased and expanded BRT services, adding bus-only interstate ramps and bus-only lanes along key downtown corridors. The increase of BRT service or the development of new services could result in substantial increases in ambient noise along any new or proposed Rapid/BRT routes. However, because Rapid/BRT routes would be along existing roadways, it is unlikely that doubling Rapid/BRT traffic would result in a substantial increase in traffic levels. For example, doubling the BRT levels on I-5 would not double the overall traffic levels on I-5, nor substantially alter the overall vehicle mix. It is therefore unlikely that an increase in traffic noise levels would occur from increasing BRT service. Thus, the proposed improvements in the 2050 RTP/SCS are not anticipated to result in noise levels in excess of local standards.

Corridor/Improvement Type	Noise Sources	$L_{eq(h)}$ Noise Level at 100 feet[1]	Potential Impacts
Local Bus/Downtown Circulator	Buses	50 dB	The 2050 RTP/SCS proposes increased local bus service and using higher capacity passenger buses. The increase in local bus service could result in substantial increase in ambient noise along any new or proposed routes from more frequent pass-bys, braking, and engine acceleration events. However, increasing local bus service would be unlikely to substantially increase the overall traffic level on surface roadways or substantially alter the traffic mix. It is therefore unlikely that a substantial increase in ambient noise levels would occur from increasing local bus service.
Enhanced Transit Transfer Locations	Transfer Points and Stations	65 dB	The 2050 RTP/SCS proposes development of typical transit stations and proposes placing them in integrated land uses or in areas that are not residential heavy. Additionally, transfer locations are proposed at several points along transit routes to avoid having locations of concentrated activity. Implementation of this strategy would reduce noise levels in noise-sensitive areas by relocating or redesigning stations so that noise-generating features are located in areas less sensitive to noise.
Bicycle Facilities	None	-	While improved bicycle facilities would offer safe alternatives to personal motor vehicle use, these facilities would not substantially affect traffic volumes. Thus, transportation-related noise levels would not be substantially changed as a result of improved bicycle lanes and facilities.
Pedestrian Facilities	None	-	As with bicycles, improving pedestrian corridors would offer alternatives to personal motor vehicle use. However, pedestrian facilities would not have a significant effect on traffic volumes. Thus, transportation-related noise levels would not change substantially as a result of improved pedestrian open space, thoroughfares, and interconnected land uses.

dB = decibels; $L_{eq}(h)$ = average hourly noise level

[1] Noise levels presented are based on standard reference noise levels as recommended in the FTA Transit Noise and Vibration Impact Assessment Manual. Actual noise levels would vary depending on actual volumes, speeds, vehicle models, and other day-to-day variances.

Sources: FTA 2006

2035

Regional Growth/Land Use Change

By 2035, the population of the region is expected to increase by 801,699 people; housing by 268,094 units; and employment by 312,292 jobs over existing 2010 conditions. As shown in Figures 4.11-4, 4.13-8, and 4.13-9, regional land use and growth changes are evident by 2035. Some locations that would experience the most extensive land use change and development by 2035 would include continued growth in eastern Chula Vista along the SR 125 and I-805 corridors; San Diego community planning areas of San Ysidro and Otay Mesa along the SR 905 and SR 125 corridors: northeast of the SR 94 corridor in the unincorporated County planning areas of Jamul/Dulzura, Tecate, and Potrero; eastern Poway along the SR 67 corridor; the County planning area of Ramona along the SR 67 and SR 78 corridors; County planning areas of Lakeside and Alpine and the Crest, Granite Hills, Dehesa, Harbison Canyon subregion; and multiple north County planning areas along the 1-15 and SR 76 corridors such as Rainbow, Fallbrook, Bonsall, Pala-Pauma Valley, Valley Center, and Hidden Valley.

Based on the increased density seen when comparing the existing housing density to the 2035 housing density, as shown in Figures 4.13-2 and 4.13-8, respectively, areas of increased density by 2035 would be apparent in some coastal cities such as Oceanside and Encinitas, and City of San Diego coastal communities; in more inland areas along the I-8 corridor through Mission Valley, College Area, and into the City of La Mesa, as well as eastern Chula Vista along the SR 125 corridor; and along the SR 78 corridor, from Escondido to I-5. The regional growth pattern in this portion of the region occurs along existing transportation corridors. Consistent with the goals of the 2050 RTP/SCS, the anticipated growth would be denser within existing urban centers providing high accessibility to transit. However, as discussed under the 2020 analysis, the pattern of denser land uses and the development along existing transportation corridors along with the proposed improvements, could expose noise-sensitive land uses to noise levels in excess of local standards.

In the northern and eastern portions of the region, land use changes to accommodate growth in 2035 in the form of spaced rural residential development would occur along the I-15 corridor north of Escondido toward the northern county line and in more eastern areas along I-8, SR 67, SR 78, and SR 94. While not the dense and compact type of development planned for urban centers, spaced rural residential in this area would still potentially result in the placement of future land uses within incompatible noise environments, such as locating residential next to agricultural, commercial, or industrial uses or within the 60–65 CNEL contour of an airport or roadway. This would result in placement of noise-sensitive land uses near, and/or within, incompatible noise environments, which could result in exposure of noise-sensitive land uses to noise levels in excess of applicable regulations and policies.

Based on the preceding analysis, the increase in population, housing, and employment development expected by 2035 would result in impacts to noise through the placement of noise-sensitive land uses near, and/or within, incompatible noise environments, which could result in exposure of noise-sensitive land uses to noise levels in excess of applicable regulations and policies. As the 2050 RTP/SCS is a program-level document, detailed, site-specific information is not available to predict either the site-specific noise impacts of future land use changes, or the effectiveness of existing laws, regulations, and programs in reducing any such site-specific impacts. Thus, while adherence to the existing laws, regulations, and programs discussed in Section 4.12.2 would reduce noise impacts upon implementation of the 2050 RTP/SCS, there is no assurance that adherence would reduce these impacts to a less than significant level. This is a significant impact.

Transportation Network Improvements

As with the 2020 analysis, the proposed transportation network improvements would expose more people to the higher levels of noise generated by high-traffic or train volumes. At the regional scale, the noise impacts of new highways, highway widening, new HOV lanes, new transit corridors, and increased frequency along existing transit corridors are generally expected when they occur in proximity to noise-sensitive receptors.

Some key highway improvements in place by 2035 would include ~~continued widening along portions of I-5;~~ additional HOV and Managed Lanes along portions of I-5, I-15, I-805, and SR 52; widening of portions of SR 125 and SR 67; and additional freeway and HOV connector improvements. Some important transit projects operational by 2035 would include continued increases in COASTER service, increases in SPRINTER service, increases in downtown area streetcar service, and substantial increases in rapid bus service throughout the region. The Trolley Blue Line would be extended from UTC to Mira Mesa via Sorrento Mesa and Carroll Canyon; the Orange Line would be extended to Lindbergh Field; Phase 1 of the new Mid-City to Downtown San Diego line would provide service from the Mid-City transit station via El Cajon Boulevard to Downtown; and a new line from Pacific Beach to El Cajon via Kearny Mesa, Mission Valley, and San Diego State University would be established. Double-tracking along the SPRINTER rail line through the cities of Oceanside, Vista, San Marco, and Escondido would take place by 2035 as well as continued double-tracking along the LOSSAN corridor. As improvements forecasted in 2035 would be similar in type and scope as improvements in 2020, the magnitude and type of noise impacts identified in Table 4.12-7 would occur under 2035 transportation network improvements as well. Thus, as with the 2020 analysis, future development would result in the development of more intense residential land uses along existing transportation corridors, which would expose more people to higher levels of noise levels. While adherence to the existing laws, regulations, and programs discussed in Section 4.12.2 would reduce noise impacts upon implementation of the 2050 RTP/SCS, there is no assurance that adherence would reduce these impacts to a less than significant level. This is a significant impact.

While expanded transit services in 2035 are expected to accommodate greater ridership in the future, this would have little effect relative to traffic on freeways and major arterials due to increases in the overall increase in population, which would result in an increase in overall VMT, in thousands, of approximately 25,~~444~~177, or 32.~~6~~ 3 percent (~~2050 RTC/SCS~~ Appendix B). VMT has a direct correlation to increases in traffic noise. Therefore, the 32.~~6~~ 3 percent increase would not result in a substantial increase in noise levels from the freeways or major arterials. Additionally, as with the 2020 analysis, increases in average daily traffic volumes by 2035 would have little effect on loudest hour noise levels as the greatest noise occurs when a roadway or freeway is operating at a maximum LOS C. Therefore, while the loudest hour is unlikely to change substantially, the overall exposure to noise levels equal to the loudest hour would increase, which would increase the CNEL in proximity to freeways and major arterials. As such, proposed improvements in 2035 are not expected to make major differences in noise levels along heavily traveled corridors due to traffic volumes.

The transit improvements forecasted for 2035 under the 2050 RTP/SCS could affect the region's noise environment through the expansion of the transit system to areas currently not being served, increased travel speeds and frequency of bus and rail services, and new rail and BRT/rapid bus lines. The location of proposed transit improvements in 2035 are shown in Figure 2.0-12. The majority of the impacts from these improvements would likely be in areas where new corridors (extended or realigned roadways/tracks) have been constructed. Since it takes a doubling or more of traffic or rail trips to cause a noticeable increase in ambient noise levels, it is less likely that increases in service along existing routes (e.g. expanded BRT, local, shuttle service) would result in substantial noise increases or exposure of local noise receptors to levels in excess of local and Caltrans standards.

Noise level increases would occur along rail corridors as speeds are increased, trains are double-tracked, and in corridors where new rails are developed where there were previously no transit facilities. The increase in rail crossings with audible warning signals would also potentially impact nearby residents. Increases in rail traffic could also lead to more train horns or whistles at crossings near residential areas, which can be a source of annoyance, especially at night or in early morning or evening.

The 2035 components of the 2050 RTP/SCS would continue actions that encourage more efficient intermodal transportation of goods. Locally, increases in rail transit tonnage would increase the number of freight trains. However, these trains would likely operate on an as-needed basis and would not have a fixed schedule. Therefore, noise levels and frequency of passbys would continue to vary greatly from day to day. On some days there may be no increase in freight train activity. Specific 2035 improvements call for further increases in COASTER operations and other extensions of commuter rail service that would be affected by intermodal rail operations. Overall, however, an increase in train traffic would yield a consequent increase in noise and vibration in areas adjacent to rail corridors.

Construction noise, analyzed in detail in Impact N-4, is also regulated by local noise ordinances. Nonetheless, construction of transportation network improvements in the 2050 RTP/SCS could exceed noise level limits of local noise ordinances. Thus, construction noise from transportation network improvements is considered a significant impact.

Based on the preceding analysis, potential noise impacts in 2035 would occur due to proposed transportation improvements; however, impacts would most likely occur due to site-specific changes, and the required precision of information to determine site-specific impacts and mitigation is greater than available. Thus, each of the projects included in the 2050 RTP/SCS would require independent evaluation during the project-level environmental assessment and review process. As the 2050 RTP/SCS is a program-level document, detailed, site-specific information is not available to predict either the site-specific noise impacts of future land use changes, or the effectiveness of future measures in reducing any such site-specific impacts. Thus, while project-level analysis would be required and site-specific measures to reduce noise impacts would be required upon implementation of the 2050 RTP/SCS, there is no assurance that the noise impacts would be reduced to a less than significant level. Therefore, this is a significant impact.

Conclusion

By 2035, land use changes associated with growth forecasted in the 2050 RTP/SCS could locate noise-sensitive land uses in areas with noise levels in excess of local standards.

Transportation network improvements involving simple capacity expansions or extension of transit services along existing alignments are not anticipated to substantially increase noise levels over the existing condition, but some improvements would expose adjacent land uses to noise levels in excess of local or Caltrans standards due to the movement of traffic closer to receivers. The development of new transit facilities where none currently exist would likely result in substantial noise level increases and could expose noise-sensitive receptors to noise levels in excess of local standards.

Therefore, the 2050 RTP/SCS would result in significant noise impacts in 2035 because both growth/land use changes and transportation network improvements would expose persons to or generate noise levels in excess of local or Caltrans standards. This is a significant impact for which mitigation measures are described in Section 4.2.5.

2050

Regional Growth/Land Use Change

By 2050, the population of the region is forecast to increase by 1,160,435 people; housing by 379,664 units; and employment by 501,958 jobs over existing conditions. As shown in Figure 4.11-5, new growth and land use changes in 2050 per the 2050 RTP/SCS are apparent throughout the region. Areas of substantial land use change and development, beyond that described in 2035, would include significant industrial development in the County's Otay planning area and San Diego Otay Mesa community surrounding the East Otay Mesa POE; throughout County planning areas located along the international border including Tecate, Potrero, Campo/Lake Morena, Boulevard, and Jacumba; throughout the Ramona and Julian planning areas in the unincorporated County; throughout other northeastern County planning areas including North Mountain, Desert, and Borrego Springs; and continued development throughout County planning areas located north and east of Escondido extending to the northern border with Riverside County including Rainbow, Fallbrook, Bonsall, Pala-Pauma Valley, Valley Center, Hidden Valley, Twin Oaks Valley, and North County Metro. As with the 2020 and 2035 analyses, future development would result in the development of more intense residential land uses along existing transportation corridors, which would expose more people to the higher levels of noise levels. Table 4.12-7 lists potential impacts associated with forecasted new and expanded facilities in 2050, including highway, freeway, rail transit, tollway, truck lanes, and freeway interchange projects. While adherence to the existing laws, regulations, and programs discussed in Section 4.12.2 would reduce noise impacts upon implementation of the 2050 RTP/SCS, there is no assurance that adherence would reduce these impacts to a less than significant level. This is a significant impact.

Increased population density from 2010 through 2050 can be seen when comparing Figures 4.13-1 and 4.13-10, respectively. Increased density is most apparent in City of San Diego communities near the downtown area near I-5 and I-805 and along the I-8 corridor to the east. Additionally, urban centers in the western third of the SANDAG region would have most available land developed with single- and multi-family uses, commercial and office uses, and industrial uses. Consistent with the goals of the 2050 RTP/SCS, the dense growth within existing urban centers with high accessibility to transit options allows for the creation of communities that are more sustainable, walkable, transit-oriented, and compact. Substantial dense growth within the urban centers corresponds with major transportation corridors such as I-5, I-8, I-15, and I-805 and these are also alignments that would have extensive transit opportunities. As discussed under the 2020 and 2035 analyses, the pattern of denser land uses, along with the transit improvements, would lead to more complex land use combinations that would potentially expose noise-sensitive land uses to noise levels in excess of local standards. While adherence to the existing laws, regulations, and programs discussed in Section 4.12.2 would reduce noise impacts upon implementation of the 2050 RTP/SCS, there is no assurance that it would reduce these impacts to a less than significant level. This is a significant impact

Similar to the description in the 2035 analysis, growth would continue in more eastern locations of the region, such as east of I-15 in the northern area, east of SR 67 through the middle portion of the region, and east of SR 94 in the southern area. However, by 2050, spaced rural residential development would have expanded beyond areas along existing transportation corridors and established rural communities and into areas with very minimal development at present. As shown in Figure 4.11-5, some of these areas include northeast of Escondido to SR 76, areas east of Camp Pendleton, and areas north and south of the SR 78 corridor. Large pockets of land currently used for agricultural purposes would be developed with spaced rural residential uses (as discussed in Section 4.2) and this would diminish the rural character of the areas. The extension of residential uses into large areas outside of the established communities and transportation corridors and into areas that are currently undeveloped would potentially result in locating noise-sensitive land uses within incompatible noise environments, such as locating residential next to

agricultural or industrial uses or within the 60–65 CNEL contour of an airport or roadway. While adherence to the existing laws, regulations, and programs discussed in Section 4.12.2 would reduce noise impacts upon implementation of the 2050 RTP/SCS, there is no assurance that adherence would reduce these impacts to a less than significant level. This is a significant impact.

As shown in Figure 4.11-5, by 2050, a substantial pocket of industrial development would be located along the planned SR 905 corridor in conjunction with the new Otay Mesa East POE at the international border with Mexico. This is a newly developing area that is planned for mainly industrial use and is highly dependent upon the planned construction of SR 11, SR 905, and the Otay Mesa East POE. The intense industrial development in this location to facilitate the transport of goods throughout the region, as designated in the 2050 RTP/SCS, would potentially lead to conflicts in land use compatibility if noise-sensitive land uses were located in or adjacent to this area. While adherence to the existing laws, regulations, and programs discussed in Section 4.12.2 would reduce noise impacts upon implementation of the 2050 RTP/SCS, there is no assurance that adherence would reduce these impacts to a less than significant level. This is a significant impact.

Transportation Network Improvements

As with the 2020 and 2035 analyses, the proposed transportation network improvements would expose more people to the higher levels of noise generated by high-traffic or train volumes. At the regional scale, the noise impacts of new highways, highway widening, new HOV lanes, new transit corridors, and increased frequency along existing transit corridors are generally expected when they occur in proximity to noise-sensitive receptors.

By 2050, most of the highway, transit, and active transportation (bicycle and pedestrian) improvements, along with other infrastructure projects, would be in place and operational in accordance with the proposed 2050 RTP/SCS. Some key highway improvements that would be in place by 2050 would include widening portions of SR 52, SR 56, SR 76, SR 94, SR 125, and I-5; additional HOV lanes and Managed Lanes along segments of I-805, I-5, I-15, SR 94, SR 125, and SR 54; and freeway and HOV connector improvements. Important transit improvements in place by 2050 would include the extension of Trolley lines and increased Trolley service frequency. The Trolley Green Line would be extended to Downtown-Bayside; ~~a new~~ Phase 2 of the line connecting ~~San Diego State University to~~ Downtown San Diego to~~via~~ El Cajon Boulevard/Mid-City would be ~~constructed~~extended to San Diego State University; and a line from University Town Center to San Ysidro ~~Palomar Trolley Station in the South Bay~~ via Kearny Mesa, Mission Valley, Mid-City, ~~and~~ National City, and Chula Vista would be established.

While expanded transit services in 2050 are expected to accommodate greater ridership in the future, this would have little effect relative to traffic on freeways and major arterials due to the overall increase in population, which is would result in an increase in overall VMT, in thousands, of approximately ~~40,152~~39,824, or 51.~~4~~ 1 percent (~~2050 RTC/SCS~~ Appendix B). VMT has a direct correlation to increases in traffic volumes; therefore, the 51.4 percent increase would likely increase noise levels from the freeways or major arterials. Thus, as in the 2020 and 2035 analyses, the expanded transit services would not make major differences in noise levels along heavily traveled corridors due to increases in traffic volumes.

Increases in public transit by 2050 would increase noise levels along rail corridors as speeds are increased, trains are double-tracked, and new rail corridors are developed where there were previously no transit facilities. The increase in rail crossings with audible warning signals would also potentially impact nearby residents. Increases in rail traffic could also lead to more train horns or whistles at crossings near residential areas, which can be a source of annoyance, especially at night or in early morning or evening.

Construction noise, analyzed in detail in Impact N-4, is also regulated by local noise ordinances. Nonetheless, construction of transportation network improvements in the 2050 RTP/SCS could exceed noise level limits of local noise ordinances. Thus, construction noise from transportation network improvements is considered a significant impact.

Based on the preceding analysis, potential noise impacts due to proposed transportation improvements would occur; however, potential impacts would be site specific and the required precision of information to determine site-specific impacts and mitigation is greater than available at this time. Thus, each of the projects included in the 2050 RTP/SCS would require independent evaluation at the project level. As the 2050 RTP/SCS is a program-level document, detailed, site-specific information is not available to predict either the site-specific noise impacts of future land use changes, or the effectiveness of future measures in reducing any such site-specific impacts. Thus, while project-level analysis would be required and site-specific measures to reduce noise impacts would be required upon implementation of the 2050 RTP/SCS, there is no assurance that the noise impacts would be reduced to a less than significant level. This is a significant impact.

Conclusion

By 2050, land use changes associated with growth forecasted in the 2050 RTP/SCS could locate noise-sensitive land uses in areas with noise levels in excess of local standards.

Transportation network improvements involving simple capacity expansions or extension of transit services along existing alignments are not anticipated to substantially increase noise levels over the existing condition, but some improvements would expose adjacent land uses to noise levels in excess of local or Caltrans standards due to the movement of traffic closer to receivers. The development of new transit facilities where none currently exist would likely result in substantial noise level increases and could expose noise-sensitive receptors to noise levels in excess of local standards.

Therefore, the 2050 RTP/SCS would result in significant noise impacts in 2050 because both growth/land use changes and transportation network improvements would expose persons to or generate noise levels in excess of local or Caltrans standards. This is a significant impact for which mitigation measures are described in Section 4.2.5.

N-2 EXPOSE PERSONS TO OR GENERATION OF EXCESSIVE GROUNDBORNE VIBRATION OR GROUNDBORNE NOISE LEVELS

Similar to noise, vibration levels can be generated from project construction and operation. If vibration amplitudes are high enough, ground vibration has the potential to damage structures, cause cosmetic damage (e.g., crack plaster), or disrupt the operation of vibration sensitive equipment. Ground vibration and groundborne noise can also be a source of annoyance to individuals who live or work close to vibration-generating activities.

Heavy construction operations can cause substantial groundborne vibration in close proximity to the source. The highest impact or heaviest equipment, such as pile drivers or large bulldozers, can generate vibrations of 1.518 to 0.089 inches per second peak particle velocity (in/sec ppv) at a distance of 25 feet, see Table 4.12-8.

The primary vibration sources associated with transportation system operations include heavy truck and bus traffic along roadways and train traffic along rail lines. However, according to Caltrans Transportation- and Construction-induced Vibration Guidance Manual, June 2004, vehicle traffic,

Table 4.12-8
Vibration Source Amplitudes for Construction Equipment

Equipment		PPV at 25 Feet (in/sec)	Approximate VdB at 25 Feet
Crack-and-seat operations[1]		2.4	116
Pile driver (impact)	upper range	1.518	112
	typical	0.644	104
Pile driver (sonic)	upper range	0.734	105
	typical	0.170	93
Vibratory roller		0.210	95
Clam shovel drop (slurry wall)		0.202	94
Hydro mill (slurry wall)	in soil	0.008	66
	in rock	0.017	75
Large bulldozer		0.089	87
Caisson drilling		0.089	87
Loaded trucks		0.076	86
Jackhammer		0.035	79
Small bulldozer		0.003	58

Source: FTA 2006
[1] Caltrans 2002a

including heavy trucks traveling on a highway, rarely generates vibration amplitudes high enough to cause structural or cosmetic damage, except in some cases, heavy trucks traveling over potholes or other discontinuities in the pavement have caused vibration high enough to result in complaints from nearby residents, which typically can be resolved by smoothing the roadway surface. Freight trains, mass-transit trains, and light-rail trains can also be sources of ground vibration.

2020

Regional Growth/Land Use Change

By 2020, population within the region is expected to increase by 310,568 people; housing by 113,062 units; and employment by 118,535 jobs. When comparing existing land use as shown in Figure 4.11-1 and 2020 land use as shown in Figure 4.11-3, there are not substantial differences in the land use patterns, types, or areas of development. Some locations that would experience the most extensive land use change and development by 2020 would include areas such as eastern Chula Vista along the SR 125 and I-805 corridors; San Diego community planning areas of San Ysidro and Otay Mesa along the SR 905 corridor; City of San Diego coastal and bay communities south of I-8 including Ocean Beach and the Peninsula planning areas; portions of northern Santee; areas north and south of the SR 56 corridor in the San Diego planning areas of Carmel Valley, Del Mar Mesa, Pacific Highlands Ranch, and Torrey Highlands; the San Marcos area near both the SR 78 and I-15 corridors; and within unincorporated County communities such as Fallbrook, Pala-Pauma Valley, and Valley Center along the I-15 and SR 76 corridors.

As the 2050 RTP/SCS envisions much of the new development and redevelopment through 2020 would be located in existing developed area, new development would occur adjacent to existing structures. Construction activities regardless of location would be similar and may include demolition of existing buildings/structures, site preparation work, excavation, foundation work, building construction, and paving. Demolition for an individual site may last several weeks to months and may produce substantial vibration. Additionally, piles or drilled caissons may also be used to support building or bridge foundations.

Typical project construction activities, such as the use of jackhammers, other high-power or vibratory tools, compactors, and tracked equipment, may also potentially generate substantial vibration (i.e. greater

than 0.2 in/sec ppv) in the immediate vicinity, typically within 15 feet of the equipment. However, typical building construction does not typically have these larger sources of vibration and is therefore not anticipated to be a source of substantial vibration. By use of administrative controls, such as scheduling, typical construction activities would be restricted to hours with least potential to affect nearby properties. Thus, perceptible vibration can be kept to a minimum and not result in human annoyance or structural damage.

Some specific construction activities result in higher levels of vibration. Pile driving has the potential to generate the highest groundborne vibration levels and is the primary concern for structural damage when it occurs within 50 feet of structures. Vibration levels generated by pile driving activities would vary depending on project conditions, such as soil conditions, construction methods, and equipment used. Pile driving activities generate vibrations at various frequencies. The dominant frequency of propagating waves from impact sources ranges mostly between 3 Hz and 60 Hz (Svinkin 1992). Using the middle range for illustration purposes, equipment operating at a frequency range of 30 Hz would exceed the perceptible range at approximately 100 feet and may result in short-term annoyance. Depending on the proximity of existing structures to each construction site, the structural soundness of the affected buildings, and the methods of construction used, vibration levels caused by pile driving or other foundation work with a substantial impact component such as blasting, rock or caisson drilling, and site excavation or compaction may be high enough to be perceptible within 100 feet and may be high enough to damage existing structures within 50 feet. Thus pile driving vibration is considered a significant impact on local vibration sensitive receptors.

Light industrial and commercial operations have, on occasion, been known to utilize equipment or processes in the manufacture and distribution of materials that have a potential to generate groundborne vibration. However, vibrations found to be excessive for human exposure that are the result of a manufacturing process or industrial machinery are generally addressed from an occupational health and safety perspective. The residual vibrations from industrial processes or machinery are typically of such low amplitude that they quickly dissipate into the surrounding soil and are rarely perceivable at the surrounding land uses. This would be a less than significant impact.

Distribution of materials to and from industrial and commercial land uses can have the potential to generate more substantial levels of groundborne vibration than that of the mechanical equipment. Heavy trucks used for delivery and distribution of materials to and from industrial and commercial sites generally operate at very low speeds while on the industrial or commercial site. Therefore, the groundborne vibration induced by heavy truck traffic at industrial or commercial land uses is not anticipated to be perceptible at distances greater than 25 feet (typical distance from roadway centerline to edge of roadway right-of-way for a single-lane road). This would be a less than significant impact.

Transportation Network Improvements

Construction vibration impacts resulting from the proposed transportation network improvements by 2020 would be similar to that described under the regional growth/land use change analysis resulting in a less than significant impact, except for pile driving. Pile driving or other foundation work would represent a significant impact on local vibration sensitive receptors.

The transportation network improvements that would be implemented between 2010 and 2020 generally include widening and/or installation of HOV lanes, ~~and~~ Managed Lanes, and Transit Lanes along portions of I-5, I-15, I-805, SR 78, and SR 94; completion of SR 905 and SR 11; and HOV connector projects along I-805 and SR 78 at I-15. Some key transit network improvements in place by 2020 would include increases in existing COASTER service, including extension of COASTER service to the San Diego Convention Center and Petco Park. BRT downtown express services from inland and south bay locations

would be expanded as well as new BRT routes from the south bay area and along I-15. Rapid bus service would add new routes and streetcar routes would be established. Airport express routes would also be developed. Local bus service would be improved to 15 minutes in key corridors. Double-tracking of the LOSSAN rail corridor would occur to accommodate increased frequency in COASTER and other rail services that utilize this rail line. In addition, the new Mid-Coast Trolley line from Old Town to University Town Center would be constructed and the Green Trolley line would be extended to downtown San Diego.

Development of new or expanded transportation systems, such as roadways and railways, would potentially locate vibration sources in proximity to vibration sensitive receptors. Caltrans conducted several transportation related vibration analyses. These studies included assessments of traffic vibrations, rail vibrations, and roadway construction vibrations (Caltrans 2002a). Traffic rarely generates vibration amplitudes high enough to cause structural or cosmetic damage (Caltrans 2004). Based on vibration measurements throughout California, worst case traffic vibrations would drop below the threshold of perception at distances of 150 feet or greater. While Caltrans in not usually involved in rail projects, on occasion the effects of train activity on a Caltrans facility must be evaluated. Thus, Caltrans conducted several measurements of train activity throughout the State and measured a peak vibration level of 0.36 in/sec ppv at 10 feet from the track. Based on this reference vibration level, vibrations from train activity would drop below the threshold of perception at distances greater than 250 feet.

The 2050 RTP/SCS includes the development of additional railways along existing railways by 2020. Thus, the number of daily events would increase, and the highest peak vibration level would be increased relative to the existing condition. In general, additional trains passing at the same point would show up as higher peaks that may expose local sensitive receptors to vibration levels in excess of 80 VdB or to a substantial increase in vibration levels relative to the existing condition. Thus, vibration associated with new railways is considered a significant impact.

Conclusion

By 2020, construction and operation of development projects implementing 2050 RTP/SCS growth/land use changes would expose existing and new development to groundborne vibration impacts. Of the various potential impacts, only groundborne vibration levels associated with pile driving are considered significant. Similarly, pile driving or other foundation work associated with transportation network improvements would represent a significant impact on local vibration sensitive receivers. Also, vibrations from increased train activity would be significant at distances less than 250 feet Therefore, in 2020, the 2050 RTP/SCS growth/and use changes and transportation network improvements would both have significant vibration impacts because they would expose persons to or generate excessive groundborne vibration. This is a significant impact for which mitigation measures are described in Section 4.2.5.

2035

Regional Growth/Land Use Change

By 2035, the population of the region is expected to increase by 801,699 people; housing by 268,094 units; and employment by 312,292 jobs over existing 2010 conditions. As shown in Figures 4.11-4, 4.13-8, and 4.13-9, regional land use and growth changes are evident by 2035. Some locations that would experience the most extensive land use change and development by 2035 would include continued growth in eastern Chula Vista along the SR 125 and I-805 corridors; San Diego community planning areas of San Ysidro and Otay Mesa along the SR 905 and SR 125 corridors: northeast of the SR 94 corridor in the unincorporated County planning areas of Jamul/Dulzura, Tecate, and Potrero; eastern Poway along the SR 67 corridor; the County planning area of Ramona along the SR 67 and SR 78 corridors; County planning areas of Lakeside and Alpine and the Crest, Granite Hills, Dehesa, Harbison Canyon subregion;

multiple north County planning areas along the 1-15 and SR 76 corridors such as Rainbow, Fallbrook, Bonsall, Pala-Pauma Valley, Valley Center, and Hidden Valley.

As in 2020, construction associated with development and redevelopment by 2035 envisioned in the 2050 RTP/SCS would be located adjacent to existing structures. Construction activities would likely include demolition of existing structures, site preparation work, excavation, foundation work, building construction, and paving. Piles or drilled caissons may also be used to support building or bridge foundations. As vibration levels caused by pile driving or other foundation work with a substantial impact component such as blasting, rock or caisson drilling, and site excavation or compaction may be high enough to be perceptible within 100 feet and may be high enough to damage existing structures within 50 feet. This would represent a significant impact on local vibration sensitive receptors.

As with the 2020 analysis, typical building construction is not anticipated to be a source of substantial vibration. By use of administrative controls, such as scheduling, typical construction activities would be restricted to hours with least potential to affect nearby properties. Thus, perceptible vibration can be kept to a minimum and, as such, typical construction activities would result in a less than significant impact.

Based on the operational characteristics of mechanical equipment and distribution methods used for general light industrial and commercial land uses, it is not anticipated that light industrial or commercial operations would result in groundborne vibration levels that approach or exceed applicable vibration-level standards. This would be a less than-significant-impact.

Transportation Network Improvements

Some key highway improvements in place by 2035 would include ~~continued widening along portions of I-5;~~ additional HOV and Managed Lanes along portions of I-5, I-15, I-805, and SR 52; widening of portions of SR 125 and SR 67; and additional freeway and HOV connector improvements. Some important transit projects operational by 2035 would include continued increases in COASTER service, increases in SPRINTER service, increases in downtown area streetcar service, and substantial increases in rapid bus service throughout the region. The Trolley Blue Line would be extended from UTC to Mira Mesa via Sorrento Mesa and Carroll Canyon; the Orange Line would be extended to Lindbergh Field; Phase 1 of the new Mid-City to Downtown San Diego line would provide service from the Mid-City transit station via El Cajon Boulevard to Downtown; and a new line from Pacific Beach to El Cajon via Kearny Mesa, Mission Valley, and San Diego State University would be established. Double-tracking along the SPRINTER rail line through the cities of Oceanside, Vista, San Marco, and Escondido would take place by 2035 as well as continued double-tracking along the LOSSAN corridor.

Construction vibration impacts resulting from the proposed transportation network improvements would be similar to those described under the regional growth/land use change analysis resulting in a less than significant impact, except for pile driving. Pile driving or other foundation work would represent a significant impact on local vibration sensitive receptors.

As identified in the previous analysis at distances greater than 250 feet train vibrations would drop below the level of perception. As the 2050 RTP/SCS includes the development of additional railways along existing railways, the number of daily events would increase and the highest peak vibration level would be higher than the existing condition. In general, the increase in events will result in higher peak levels (Caltrans 2002a). Thus, proposed rail improvements in 2035 could expose local sensitive receptors to vibration levels in excess of 80 VdB or to a substantial increase in vibration levels. Thus, vibration associated with new railways is considered a significant impact.

Conclusion

By 2035, construction and operation of development projects implementing 2050 RTP/SCS growth/land use changes would expose existing and new development to groundborne vibration impacts. Of the various potential impacts, only groundborne vibration levels associated with pile driving and foundation work are considered significant. Similarly, pile driving or other foundation work associated with transportation network improvements would represent a significant impact on local vibration sensitive receivers. Also, vibrations from increased train activity would be significant at distances less than 250 feet Therefore, in 2035, the 2050 RTP/SCS growth/and use changes and transportation network improvements would both have significant vibration impacts because they would expose persons to or generate excessive groundborne vibration. This is a significant impact for which mitigation measures are described in Section 4.2.5. ~~(The mitigation measures described in Section 4.12.5 are not "required" until CEQA findings are adopted. At this point, they are potentially feasible mitigation measures.)~~

~~By 2050, implementation of the 2050 RTP/SCS would result in land uses changes and the construction of transportation network improvements that would cause a substantial adverse change in the significance of a cultural resource. This is a significant impact for which mitigation measures are described in Section 4.2.5.~~

2050

Regional Growth/Land Use Change

By 2050, the population of the region is forecast to increase by 1,160,435 people; housing by 379,664 units; and employment by 501,958 jobs over existing conditions. As shown in Figure 4.11-5, new growth and land use changes in 2050 per the 2050 RTP/SCS are apparent throughout the region. Areas of substantial land use change and development, beyond that described in 2035, would include significant industrial development in the County's Otay planning area and San Diego Otay Mesa community surrounding the East Otay Mesa POE; throughout County planning areas located along the international border including Tecate, Potrero, Campo/Lake Morena, Boulevard, and Jacumba; throughout the Ramona and Julian planning areas in the unincorporated County; throughout other northeastern County planning areas including North Mountain, Desert, and Borrego Springs; and continued development throughout County planning areas located north and east of Escondido extending to the northern border with Riverside County including Rainbow, Fallbrook, Bonsall, Pala-Pauma Valley, Valley Center, Hidden Valley, Twin Oaks Valley, and North County Metro.

As with the 2020 and 2035, by 2050, land use pattern changes on a regionwide basis could include new development or redevelopment adjacent to or in close proximity to existing land uses increasing the likelihood of groundborne vibration impacts from construction and operation of certain land uses. Typical construction groundborne vibrations are localized and would be less than significant. Groundborne vibration levels associated with pile driving are much greater and would be considered significant. Based on the operational characteristics of mechanical equipment and distribution methods used for general light industrial and commercial land uses, it is not anticipated that light industrial or commercial operations would result in groundborne vibration levels that approach or exceed applicable vibration-level standards. This would be a less than significant impact. Thus, groundborne vibrations associated with the development of new development and new development would be less than significant.

As with the 2035 analysis, construction vibration impacts resulting from proposed transportation network improvements by 2050 would result in a less than significant impact. However, pile driving or other foundation work would represent a significant impact on local vibration sensitive receivers due to the more intense nature of the activity. Traffic vibration associated with 2050 transportation network improvements would be less than significant. However, vibrations from train activity would be significant at distances less than 250 feet, which may increase due to two trains passing at the same moment or result

in exposure of existing receivers to a substantial increase in vibrations. Thus, train vibration is considered a significant impact.

Transportation Network Improvements

By 2050, most of the highway, transit, and active transportation (bicycle and pedestrian) improvements, along with other infrastructure projects, would be in place and operational in accordance with the proposed 2050 RTP/SCS. Some key highway improvements that would be in place by 2050 would include widening portions of SR 52, SR 56, SR 76, SR 94, SR 125, and I-5; additional HOV lanes and Managed Lanes along segments of I-805, I-5, I-15, SR 94, SR 125, and SR 54; and freeway and HOV connector improvements. Important transit improvements in place by 2050 would include the extension of Trolley lines and increased Trolley service frequency. The Trolley Green Line would be extended to Downtown-Bayside; ~~a new~~ Phase 2 of the line connecting ~~San Diego State University to~~ Downtown San Diego to~~via~~ El Cajon Boulevard/Mid-City would be ~~constructed~~extended to San Diego State University; and a line from University Town Center to San Ysidro ~~Palomar Trolley Station in the South Bay~~ via Kearny Mesa, Mission Valley, Mid-City, ~~and~~ National City, and Chula Vista would be established.

Construction vibration impacts resulting from the proposed transportation network improvements would be similar to those described under the regional growth/land use change analysis resulting in a less than significant impact, except pile driving. Pile driving or other foundation work would represent a significant impact on local vibration sensitive receptors.

Based on the previous analysis, vibrations from train activity would drop below the threshold of perception at distances greater than 250 feet. The 2050 RTP/SCS does not include the development of additional railways along existing railway corridors and in 2050 does not propose improvements to major commuter or freight railways only light rail facilities. Thus, it can be assumed that while the number of daily events would be similar as in 2035. In general, while no projects in 2050 are anticipated to result in new substantial vibration sources, the vibration increases in 2020 and 2035 would continue in 2050 to exceed applicable thresholds at distances of less than 250 feet from railways. Thus, proposed rail improvements in 2035 could expose local sensitive receptors to vibration levels in excess of 80 VdB or to a substantial increase in vibration levels. Thus, vibration associated with new railways is considered a significant impact.

Conclusion

By 2050, construction and operation of development projects implementing 2050 RTP/SCS growth/land use changes would expose existing and new development to groundborne vibration impacts. Of the various potential impacts, only groundborne vibration levels associated with pile driving and foundation work are considered significant. Similarly, pile driving or other foundation work associated with transportation network improvements would represent a significant impact on local vibration sensitive receivers. Also, vibrations from increased train activity would be significant at distances less than 250 feet Therefore, in 2050, the 2050 RTP/SCS growth/and use changes and transportation network improvements would both have significant vibration impacts because they would expose persons to or generate excessive groundborne vibration. This is a significant impact for which mitigation measures are described in Section 4.2.5.

N-3 CAUSE A SUBSTANTIAL PERMANENT INCREASE IN AMBIENT NOISE LEVELS IN THE PROJECT VICINITY ABOVE EXISTING LEVELS

Analysis Methodology

Generally, transportation-related noise sources characterize the ambient noise environment of an area. The operation of transportation projects could result in a permanent increase in ambient noise levels in the vicinity of project's forecasted in the SANDAG 2050 RTP due to increased traffic traveling along the project route and adjacent routes.

Noise associated with highway traffic is dependent on traffic volume, speed, fleet mix (cars, trucks, etc.), and the proximity of noise-sensitive receptors. According to the Federal Highway Administration (FHWA), 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).

Different agencies have established various definitions for what is considered a substantial increase in ambient noise level. A substantial permanent increase is defined for the purposes of this analysis as an increase of +5 dBA as recommended by the FTA for existing noise levels ranging from 60 to 65 dBA L_{dn} (FTA 2006).

2020

Regional Growth/Land Use Change

By 2020, population within the region is expected to increase by 310,568 people; housing by 113,062 units; and employment by 118,535 jobs. When comparing existing land use as shown in Figure 4.11-1 and 2020 land use as shown in Figure 4.11-3, there are not substantial differences in the land use patterns, types, or areas of development. Some locations that would experience the most extensive land use change and development by 2020 would include areas such as eastern Chula Vista along the SR 125 and I-805 corridors; San Diego community planning areas of San Ysidro and Otay Mesa along the SR 905 corridor; City of San Diego coastal and bay communities south of I-8 including Ocean Beach and the Peninsula planning areas; portions of northern Santee; areas north and south of the SR 56 corridor in the San Diego planning areas of Carmel Valley, Del Mar Mesa, Pacific Highlands Ranch, and Torrey Highlands; the San Marcos area near both the SR 78 and I-15 corridors; and within unincorporated County communities such as Fallbrook, Pala-Pauma Valley, and Valley Center along the I-15 and SR 76 corridors.

As stated in Impact N-1, the increase in population, housing, and employment development expected by 2020 would result in increases in ambient noise levels through conflicts in land use, such as placing residential uses next to commercial or industrial uses, and expansion of existing development or transportation corridors. Development projects would be required to comply with all applicable noise regulations, which would limit noise impacts between land uses, but there is no guarantee that noise level increases, even when absolute noise levels comply with local standards, would be less than significant for all projects.

Under the 2050 RTP/SCS land use development intensity is anticipated to be greater, see Figures 4.13-1 and 4.13-4, which would place receptors in proximity to more or potentially louder noise sources. This would be likely to result in substantial noise level increases of 5 dBA over existing conditions. While, compliance with the existing policies and regulations included in Section 4.12.2 would limit noise levels between land uses in the SANDAG region, compliance cannot guarantee that all future project-level impacts would be avoided or below a significant level. Thus, this would be considered a significant impact.

Transportation Network Improvements

The transportation network improvements that would be implemented between 2010 and 2020 generally include widening and/or installation of HOV lanes, ~~and~~ Managed Lanes, and Transit Lanes along portions of I-5, I-15, I-805, SR 78, and SR 94; completion of SR 905 and SR 11; and HOV connector projects along I-805 and SR 78 at I-15. Some key transit network improvements in place by 2020 would include increases in existing COASTER service, including extension of COASTER service to the San Diego Convention Center and Petco Park. BRT downtown express services from inland and south bay locations would be expanded as well as new BRT routes from the south bay area and along I-15. Rapid bus service would add new routes and streetcar routes would be established. Airport express routes would also be developed. Local bus service would be improved to 15 minutes in key corridors. Double-tracking of the LOSSAN rail corridor would occur to accommodate increased frequency in COASTER and other rail services that utilize this rail line. In addition, the new Mid-Coast Trolley line from Old Town to University Town Center would be constructed and the Green Trolley line would be extended to downtown San Diego.

The noise impacts of the transportation improvements described in the 2050 RTP/SCS would generally be adverse as the improvements would increase noise levels adjacent to transportation network improvements (see Table 4.12-7 for a list of proposed improvements and potential noise impacts). Noise level increases associated with transportation network improvements would primarily result from predicted regional population growth of 310,568 and the associated increases in the number of trucks, buses, and trains operating forecasted under the 2050 RTC/SCS, which generate greater noise per vehicle than automobiles (Caltrans 2009).

At the regional scale, the noise impacts of new highways, highway widening, new HOV lanes, new transit corridors, and increased frequency along existing transit corridors are generally expected to increase noise levels when they occur in proximity to noise-sensitive receptors. Tables 2.0-5, 2.0-6, and 2.0-7 list proposed new and expanded facilities with potential, including highway, freeway, rail transit, tollway, truck lanes, and freeway interchange projects. The location of proposed transit and highway improvements are shown in figures 2.0-11 and 2.0-19. Increases in public transit would also increase noise levels along rail corridors where speeds are increased, trains are double-tracked, or in new rail corridors where there were previously no trains. Increased noise levels would only be relevant where adjacent sensitive receivers are located along existing or proposed rail corridors. Rail crossings also utilize audible warning signals that could impact nearby residents. Increases in rail traffic could also lead to more train horns or whistles at crossings near residential areas, which can be a source of annoyance, especially at night or in early morning or evening. Noise would impact those sensitive receptors located in areas that are exposed to new transportation noise (from/expanded increased service or new service) exceeding ambient noise levels by 5 dBA. The majority of these impacts would likely be in areas where new corridors (extended or realigned roadways/tracks) have been constructed. Since it takes a doubling or more of traffic or rail trips to cause a noticeable increase in ambient noise levels, it is less likely that increases in service along existing routes (e.g. expanded BRT, local, Shuttle service) would cause noise impacts.

While expanded transit services in 2020 are expected to accommodate greater ridership in the future, this would have little effect relative to traffic on freeways and major arterials due to the overall increase in population, which is would result in an increase in overall VMT, in thousands, of approximately 8,154~~8,169~~, or 10.5 percent (~~2050 RTC/SCS~~ Appendix B). VMT has a direct correlation to increases in traffic volumes; therefore, the 10.5 percent increase would likely increase noise levels from the freeways or major arterials. In addition, reductions in traffic congestion could lead to slight increases in noise as traffic speeds increase. None of these factors are expected to result in significant increases in noise levels along heavily traveled corridors, such as the I-5, I-805, and I-15. As a doubling of vehicle volumes would

be required to make a 3 dB increase on existing alignments (CalTrans 2009), the forecasted 2020 improvements are unlikely to result in a substantial increase in ambient noise levels from increases in traffic volumes. However, the proposed transportation network improvements could potentially move traffic closer to local receptors or change existing shielding, which would result in a substantial increase in noise levels at local noise-sensitive receptors.

Based on the preceding analysis, potential noise impacts would occur due to proposed transportation network improvements. As the proposed improvements could expose noise-sensitive land uses to substantial noise level increases, operation of these improvements would result in a significant noise impact.

Conclusion

By 2020, land use changes associated with growth forecasted in the 2050 RTP/SCS could locate noise-sensitive land uses in areas with where noise levels could increase substantial amounts above existing conditions. Transportation network improvements would generally not substantially increase noise levels over the existing condition, but some improvements could increase ambient noise levels by 5 or more dBA from the movement of traffic closer to receivers or development of new facilities where none currently exist. Therefore, the 2050 RTP/SCS would result in significant noise impacts in 2020 because it would cause a substantial permanent increase in ambient noise levels. This is a significant impact for which mitigation measures are described in Section 4.2.5.

2035

Regional Growth/Land Use Change

By 2035, the population of the region is expected to increase by 801,699 people; housing by 268,094 units; and employment by 312,292 jobs over existing 2010 conditions. As shown in Figures 4.11-4, 4.13-8, and 4.13-9, regional land use and growth changes are evident by 2035. Some locations that would experience the most extensive land use change and development by 2035 would include continued growth in eastern Chula Vista along the SR 125 and I-805 corridors; San Diego community planning areas of San Ysidro and Otay Mesa along the SR 905 and SR 125 corridors: northeast of the SR 94 corridor in the unincorporated County planning areas of Jamul/Dulzura, Tecate, and Potrero; eastern Poway along the SR 67 corridor; the County planning area of Ramona along the SR 67 and SR 78 corridors; County planning areas of Lakeside and Alpine and the Crest, Granite Hills, Dehesa, Harbison Canyon subregion; and multiple north County planning areas along the 1-15 and SR 76 corridors such as Rainbow, Fallbrook, Bonsall, Pala-Pauma Valley, Valley Center, and Hidden Valley.

Based on the increased density seen when comparing the existing housing density to the 2035 housing density, as shown in Figures 4.13-2 and 4.13-8, respectively, areas of increased density by 2035 would be apparent in some coastal cities such as Oceanside and Encinitas, and City of San Diego coastal communities; in more inland areas along the I-8 corridor through Mission Valley, College Area, and into the City of La Mesa, as well as eastern Chula Vista along the SR 125 corridor; and along the SR 78 corridor, from Escondido to I-5. The regional growth pattern in this portion of the region occurs along existing transportation corridors. Consistent with the goals of the 2050 RTP/SCS, the anticipated growth would be denser within existing urban centers providing high accessibility to transit.

In the northern and eastern portions of the region, land use changes to accommodate growth in 2035 in the form of spaced rural residential development would occur along the I-15 corridor north of Escondido toward the northern county line and in more eastern areas along I-8, SR 67, SR 78, and SR 94. The development envisioned in these areas would be less dense than development planned for urban centers.

The increase in population, housing, and employment development expected by 2035 would result in a permanent increase in noise levels due to operation of stationary noise sources and operations associated with commercial and industrial land uses. Under the 2050 RTP/SCS land use development, intensity is anticipated to be greater, which would place receptors in proximity to more or potentially louder noise sources. This would result in potentially substantial noise level increases of 5 dBA or more.

Based on the preceding analysis of regional growth and land use change, potential noise impacts would occur due to proposed intensification of development. As the proposed development could expose noise-sensitive land uses to substantial noise level increases, operation of these improvements would result in a significant noise impact. While compliance with the existing policies and regulations included in Section 4.12.2 would limit noise levels between land uses in the SANDAG region, compliance cannot guarantee that all future project-level impacts would be avoided or below a significant level. Thus, this would be considered a significant impact.

Transportation Network Improvements

Some key highway improvements in place by 2035 would include ~~continued widening along portions of I-5;~~ additional HOV and Managed Lanes along portions of I-5, I-15, I-805, and SR 52; widening of portions of SR 125 and SR 67; and additional freeway and HOV connector improvements. Some important transit projects operational by 2035 would include continued increases in COASTER service, increases in SPRINTER service, increases in downtown area streetcar service, and substantial increases in rapid bus service throughout the region. The Trolley Blue Line would be extended from UTC to Mira Mesa via Sorrento Mesa and Carroll Canyon; the Orange Line would be extended to Lindbergh Field; Phase 1 of the new Mid-City to Downtown San Diego line would provide service from the Mid-City transit station via El Cajon Boulevard to Downtown; and a new line from Pacific Beach to El Cajon via Kearny Mesa, Mission Valley, and San Diego State University would be established. Double-tracking along the SPRINTER rail line through the cities of Oceanside, Vista, San Marco, and Escondido would take place by 2035 as well as continued double-tracking along the LOSSAN corridor.

As with the 2020 analysis, the noise impacts of the transportation improvements by 2035 described in the 2050 RTP/SCS would generally be adverse as the improvements would increase noise levels adjacent to transportation network improvements (see Table 4.12-7 for a list of proposed improvements and potential noise impacts). At the regional scale, the noise impacts of new highways, highway widening, new HOV lanes, new transit corridors, and increased frequency along existing transit corridors are generally expected when they occur in proximity to noise-sensitive receptors.

The 2050 RTP/SCS includes major transit improvements designed to improve and expand services and increase ridership. The transit improvements forecasted for 2035 under the 2050 RTP/SCS could affect the region's noise environment through the expansion of the transit system to areas currently not being served, increased travel speeds and frequency of bus and rail services, and new rail and BRT/rapid bus lines. Tables 2.0-5, 2.0-6 and 2.0-7 list the forecasted 2035 projects under the 2050 RTP/SCS. Noise would impact those sensitive receptors located in areas that are exposed to new transportation noise (from increased service or new service). The majority of these impacts would likely be in areas where new corridors (extended or realigned roadways/tracks) have been constructed. Since it takes a doubling or more of traffic or rail trips to cause a noticeable increase in ambient noise levels, it is less likely that increases in service along existing routes (e.g., expanded BRT, local, shuttle service) would cause noise impacts. Proposed transit improvements in 2035 are shown in Figure 2.0-12.

While expanded transit services in 2035 are expected to accommodate greater ridership in the future, this would have little effect relative to traffic on freeways and major arterials due to the overall increase in population, which would result in an increase in overall VMT, in thousands, of approximately 25,~~444~~177,

or 32.~~6~~ 3 percent (~~2050 RTC/SCS~~ Appendix B). VMT has a direct correlation to increases in traffic volumes; therefore, the 32.~~6~~3 percent increase would likely increase noise levels from the freeways or major arterials. In addition, reductions in traffic congestion could lead to slight increases in noise as traffic speeds increase. Thus, as in the 2020 analysis, the expanded transit services would not reduce traffic on freeways and major arterials. As such, proposed improvements in 2035 are not expected to make major differences in noise levels along heavily traveled corridors due to increases in traffic volumes. However, the proposed transportation network improvements could potentially move traffic closer to local receptors or change existing shielding, which would result in a substantial increase in noise levels at local noise-sensitive receptors.

Based on the preceding analysis, potential noise impacts would occur due to proposed transportation network improvements. As the proposed transportation network improvements could expose noise-sensitive land uses to substantial noise level increases, operation of these improvements would result in a significant noise impact.

Conclusion

As with the 2020 analysis, the increase in population, housing, and employment development expected by 2035 would result in substantial noise level increases of 5 dBA or more. While, compliance with the existing policies and regulations included would limit noise levels between land uses in the SANDAG region, compliance cannot guarantee that all future project-level impacts would be avoided or reduced below a significant level. Thus, this would be considered a significant impact. At the regional scale, by 2035, the noise impacts of new highways, highway widening, new HOV/managed lanes, new transit corridors, and increased activity along existing transit corridors are generally expected to result in a significant permanent increase in noise levels at noise-sensitive receptors in proximity to major transportation corridors. This is a significant impact for which mitigation measures are described in Section 4.2.5.

2050

Regional Growth/Land Use Change

By 2050, the population of the region is forecast to increase by 1,160,435 people; housing by 379,664 units; and employment by 501,958 jobs over existing conditions. As shown in Figure 4.11-5, new growth and land use changes in 2050 per the 2050 RTP/SCS are apparent throughout the region. Areas of substantial land use change and development, beyond that described in 2035, would include significant industrial development in the County's Otay planning area and San Diego Otay Mesa community surrounding the East Otay Mesa POE; throughout County planning areas located along the international border including Tecate, Potrero, Campo/Lake Morena, Boulevard, and Jacumba; throughout the Ramona and Julian planning areas in the unincorporated County; throughout other northeastern County planning areas including North Mountain, Desert, and Borrego Springs; and continued development throughout County planning areas located north and east of Escondido extending to the northern border with Riverside County including Rainbow, Fallbrook, Bonsall, Pala-Pauma Valley, Valley Center, Hidden Valley, Twin Oaks Valley, and North County Metro

As with the 2020 and 2035 scenarios, growth and development are expected to continue to increase within the region by 2050. As with 2035, land use patterns outlined in the 2050 RTP/SCS focus increase densities in existing urban centers, in coastal cities and cities along the major transportation corridors. However, in 2050, additional growth would continue in more eastern locations of the region, such as east of I-15 in the northern area, east of SR-67 through the central portion of the region, and east of SR-94 in the southern portion. Based on the projected 2050 scenario, spaced rural residential development would have expanded beyond areas along existing transportation corridors and established rural communities

and into areas with very minimal development at present. Additionally, a substantial pocket of industrial development would be located along the planned SR-905 corridor in conjunction with the new Otay Mesa East POE at the international border with Mexico. This is a newly developing area that is planned for mainly industrial use and is highly dependent upon the planned construction of SR-11, SR-905, and the Otay Mesa East POE. The project growth would result in more residential development near, and/or within, high noise environments, which could result in an increase in ambient noise levels by 5 or more dBA. Impacts from these types of projects and development would cause noise impacts in areas of the County that would not be impacted under 2020 and 2035 conditions. This is considered a significant impact. Tables 2.0-5, 2.0-6, and 2.0-7 outline the transit projects and locations as shown in Figures 2.0-13 and 2.0-17 slated for development by the year 2050. As in the 2020 and 2035 analyses, existing policies and regulations included in Section 4.12.2 would reduce, but not completely abate, the noise impacts.

Based on the preceding analysis of regional growth and land use change, potential noise impacts would occur due to proposed intensification of development. As the development could expose noise-sensitive land uses to substantial noise level increases, operation of these improvements would result in a significant noise impact. While, compliance with the existing policies and regulations included in Section 4.12.2 would limit noise levels between land uses in the SANDAG region, compliance cannot guarantee that all future project-level impacts would be avoided or below a significant level. Thus, this would be considered a significant impact.

Transportation Network Improvements

By 2050, most of the highway, transit, and active transportation (bicycle and pedestrian) improvements, along with other infrastructure projects, would be in place and operational in accordance with the proposed 2050 RTP/SCS. Some key highway improvements that would be in place by 2050 would include widening portions of SR 52, SR 56, SR 76, SR 94, SR 125, and I-5; additional HOV lanes and Managed Lanes along segments of I-805, I-5, I-15, SR 94, SR 125, and SR 54; and freeway and HOV connector improvements. Important transit improvements in place by 2050 would include the extension of Trolley lines and increased Trolley service frequency. The Trolley Green Line would be extended to Downtown-Bayside; ~~a new~~ Phase 2 of the line connecting ~~San Diego State University to~~ Downtown San Diego to~~via~~ El Cajon Boulevard/Mid-City would be ~~constructed~~extended to San Diego State University; and a line from University Town Center to San Ysidro ~~Palomar Trolley Station in the South Bay~~ via Kearny Mesa, Mission Valley, Mid-City, ~~and~~ National City, and Chula Vista would be established.

As with the 2020 and 2035 analyses, the expanded transportation corridors could expose more people to the higher levels of noise generated by high-traffic and train volumes along these corridors. At the regional scale, the noise impacts of new highways, highway widening, new HOV lanes, new transit corridors, and increased frequency along existing transit corridors are generally expected to increase ambient noise levels above existing conditions. Table 4.12-7 lists potential impacts associated with proposed new and expanded facilities in 2050, including highway, freeway, rail transit, tollway, truck lanes, and freeway interchange projects.

Tables 2.0-5, 2.0-6, and 2.0-7 list the forecasted 2050 projects under the 2050 RTP/SCS. Noise would impact those sensitive receptors that are exposed to new transportation noise (from expanded/increased service or new service) that would increase a substantial amount (+5 dBA). The majority of these impacts would likely be in areas where new corridors (extended or realigned roadways/tracks) have been constructed. Since it takes a doubling or more of traffic or rail trips to cause a noticeable increase in ambient noise levels, it is less likely that increases in service along existing routes (e.g. expanded BRT, local, Shuttle service) would cause noise impacts.

While expanded transit services in 2050 are expected to accommodate greater ridership in the future, this would have little effect relative to traffic on freeways and major arterials due to the overall increase in population, which would result in an increase in overall VMT, in thousands, of approximately ~~40,152~~39,824, or 51.14 percent (~~2050 RTC/SCS~~ Appendix B). VMT has a direct correlation to increases in traffic volumes; therefore, the 51.14 percent increase would likely increase noise levels from the freeways or major arterials. In addition, reductions in traffic congestion could lead to slight increases in noise as traffic speeds increase. Thus, as in the 2020 and 2035 analyses, the expanded transit services would not reduce traffic on freeways and major arterials. As such, forecasted improvements in 2050 are not expected to make major differences in noise levels along heavily traveled corridors due to increases in traffic volumes.

Based on the preceding analysis, potential noise impacts would occur due to forecasted 2050 transportation network improvements. As the proposed transportation network improvements could expose noise-sensitive land uses to substantial noise level increases, operation of these improvements would result in a significant noise impact.

Conclusion

As with the 2020 and 2035 analyses, the increase in population, housing, and employment development expected by 2050 would result in substantial noise level increases of 5 dBA or more. While, compliance with the existing policies and regulations included would limit noise levels between land uses in the SANDAG region, compliance cannot guarantee that all future project-level impacts would be avoided or below a significant level. At the regional scale, by 2050, the noise impacts of new highways, highway widening, new HOV/managed lanes, new transit corridors, and increased frequency along existing transit corridors are generally expected to result in a significant permanent increase in noise levels at noise-sensitive receptors in proximity to major transportation corridors. This is a significant impact for which mitigation measures are described in Section 4.2.5.

N-4 CAUSE A SUBSTANTIAL TEMPORARY OR PERIODIC INCREASE IN AMBIENT NOISE LEVELS IN THE PROJECT VICINITY ABOVE EXISTING LEVELS

Analysis Methodology

Construction activities associated with the 2050 RTP/SCS would result in temporary or periodic increases in ambient noise levels at nearby sensitive receptors. Noise impacts to sensitive receptors would depend on the type of construction proposed, the land use, and duration of construction activities. Additionally, construction noise levels would vary 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. While, construction-related noise impacts would be short term and localized in nature, impacts and noise controls on construction would be similar throughout the San Diego region.

Construction noise impact criteria are based on local and FTA Transit Noise and Vibration Impact Assessment Manual criteria. Most local jurisdictions identify a noise level limit of 75 dBA L_{eq} for construction noise. FTA recommends construction noise impact criteria of 90 dBA hourly L_{eq} for programmatic analysis and considers a noise level increase of 10 dBA above ambient noise levels a substantial temporary increase in noise levels.

2020

Regional Growth/Land Use Change

By 2020, population within the region is expected to increase by 310,568 people; housing by 113,062 units; and employment by 118,535 jobs. However, when comparing existing land use as shown in Figure 4.11-1 and 2020 land use as shown in Figure 4.11-3, there are no substantial differences in the land use patterns, types, or areas of development. Locations that would experience the most extensive land use change and development by 2020 would include areas such as eastern Chula Vista along the SR 125 and I-805 corridors; San Diego community planning areas of San Ysidro and Otay Mesa along the SR 905 corridor; City of San Diego coastal and bay communities south of I-8 including Ocean Beach and the Peninsula planning areas; portions of northern Santee; areas north and south of the SR 56 corridor in the San Diego planning areas of Carmel Valley, Del Mar Mesa, Pacific Highlands Ranch, and Torrey Highlands; the San Marcos area near both the SR 78 and I-15 corridors; and within unincorporated County communities such as Fallbrook, Pala-Pauma Valley, and Valley Center along the I-15 and SR 76 corridors.

Construction can result in a significant, although typically short-term, increase in noise levels. Construction is most significant when it takes place near sensitive land uses or occurs at night or in early morning hours. Construction noise can also affect nearby wildlife by interfering with the ability to establish territory, vocalize, or successfully reproduce. Additional discussion of noise impacts to wildlife is provided in Section 4.4, Biological Resources. As under Impact N-1, local governments typically regulate noise associated with 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. Table 4.12-9 shows typical exterior noise levels at various phases of commercial construction.

Table 4.12-9
Typical Commercial Construction Noise Levels

Construction Phase	Noise Level (dBA, L_{eq})[1]
Ground Clearing	84
Excavation	89
Pile Driving	100
Foundations	78
Erection	85
Finishing	89

[1] Average noise levels 50 feet from the noisiest source and 200 feet from the rest of the equipment associated with a given construction phase. Noise levels correspond to commercial projects in a typical urban ambient noise environment.
Source: USEPA 1971

Construction activities associated with 2050 RTP/SCS growth/land use changes would result in temporary noise increases at nearby sensitive receptors. Impacts to sensitive receptors resulting from development projects would depend on several factors, such as the type of development, surrounding land uses in a given area, and duration of proposed construction activities. Additionally, construction noise levels would fluctuate depending on equipment type and duration of use; distance between noise source and receptor; and presence or absence of barriers between noise source and receptor. Typically, construction noise would attenuate to less than 60 dBA L_{eq} at distances of 500 feet or greater and would attenuate to 75 dBA L_{eq} or less at distances of 160 feet or greater. While noise levels along existing corridors can be assumed to range from 60 to 75 dBA depending on proximity, construction could still result in substantial temporary increase at these receptors. Additionally, temporary noise level increases

exceeding 10 dBA above ambient noise levels along routes with low existing activity or along new routes would be considered substantial. While, construction-related noise impacts would be short term and localized in nature, construction of development projects implementing the 2050 RTP/SCS could result in a substantial increase in short-term noise; thus, this impact would be significant.

Transportation Network Improvements

The transportation network improvements that would be implemented between 2010 and 2020 generally include widening and/or installation of HOV lanes, ~~and~~ Managed Lanes, and Transit Lanes along portions of I-5, I-15, I-805, SR 78, and SR 94; completion of SR 905 and SR 11; and HOV connector projects along I-805 and SR 78 at I-15. Some key transit network improvements in place by 2020 would include increases in existing COASTER service, including extension of COASTER service to the San Diego Convention Center and Petco Park. BRT downtown express services from inland and south bay locations would be expanded as well as new BRT routes from the south bay area and along I-15. Rapid bus service would add new routes and streetcar routes would be established. Airport express routes would also be developed. Local bus service would be improved to 15 minutes in key corridors. Double-tracking of the LOSSAN rail corridor would occur to accommodate increased frequency in COASTER and other rail services that utilize this rail line. In addition, the new Mid-Coast Trolley line from Old Town to University Town Center would be constructed and the Green Trolley line would be extended to downtown San Diego.

Construction of the 2050 RTP/SCS transportation network improvements would result in similar noise impacts as identified under the regional growth/land use change discussion. Thus, while typical construction noise would attenuate to less than 60 dBA L_{eq} at distances of 500 feet or greater and would attenuate to 75 dBA L_{eq} or less at distances of 160 feet or greater, construction could still result in substantial temporary increase at nearby receptors of greater than 10 dBA. Therefore, construction of projects associated with the transportation network improvements in the 2050 RTP/SCS could result in a substantial increase in short-term noise; thus, this impact would be significant.

Conclusion

By 2020, construction of development projects implementing 2050 RTP/SCS growth/land use changes, and construction of transportation network improvements, would likely expose sensitive receptors to temporary increases in ambient noise levels exceeding 10 dBA above ambient noise levels. Therefore, this is a significant impact for which mitigation measures are described in Section 4.2.5.

2035

Regional Growth/Land Use Change

By 2035, the population of the region is expected to increase by 801,699 people; housing by 268,094 units; and employment by 312,292 jobs over existing 2010 conditions. As shown in Figures 4.11-4, 4.13-8, and 4.13-9, regional land use and growth changes are evident by 2035. Some locations that would experience the most extensive land use change and development by 2035 would include continued growth in eastern Chula Vista along the SR 125 and I-805 corridors; San Diego community planning areas of San Ysidro and Otay Mesa along the SR 905 and SR 125 corridors: northeast of the SR 94 corridor in the unincorporated County planning areas of Jamul/Dulzura, Tecate, and Potrero; eastern Poway along the SR 67 corridor; the County planning area of Ramona along the SR 67 and SR 78 corridors; County planning areas of Lakeside and Alpine and the Crest, Granite Hills, Dehesa, Harbison Canyon subregion; and multiple north County planning areas along the 1-15 and SR 76 corridors such as Rainbow, Fallbrook, Bonsall, Pala-Pauma Valley, Valley Center, and Hidden Valley.

As with the 2020 analysis, construction activities by 2035 associated with the 2050 RTP/SCS would result in temporary noise increases at nearby sensitive receptors. Impacts to sensitive receptors resulting from these proposed improvements would depend on several factors, such as the type of improvement, surrounding land uses in a given area, and duration of proposed construction activities. Additionally, construction noise levels would fluctuate depending on equipment type and duration of use; distance between noise source and receptor; and presence or absence of barriers between noise source and receptor. Typically, construction noise would attenuate to less than 60 dBA L_{eq} at distances of 500 feet or greater and would attenuate to 75 dBA L_{eq} or less at distances of 160 feet or greater. While noise levels along existing corridors can be assumed to range from 60 to 75 dBA depending on proximity, construction could still result in substantial temporary increase at these receptors. Additionally, noise level increases exceeding 10 dBA above ambient noise levels along routes with low existing activity or along new routes would be considered substantial. While, construction-related noise impacts would be short term and localized in nature, construction of development projects implementing the 2050 RTP/SCS could result in a substantial increase in short-term noise; thus, this impact would be significant.

Transportation Network Improvements

Some key highway improvements in place by 2035 would include ~~continued widening along portions of I-5;~~ additional HOV and Managed Lanes along portions of I-5, I-15, I-805, and SR 52; widening of portions of SR 125 and SR 67; and additional freeway and HOV connector improvements. Some important transit projects operational by 2035 would include continued increases in COASTER service, increases in SPRINTER service, increases in downtown area streetcar service, and substantial increases in rapid bus service throughout the region. The Trolley Blue Line would be extended from UTC to Mira Mesa via Sorrento Mesa and Carroll Canyon; the Orange Line would be extended to Lindbergh Field; Phase 1 of the new Mid-City to Downtown San Diego line would provide service from the Mid-City transit station via El Cajon Boulevard to Downtown; and a new line from Pacific Beach to El Cajon via Kearny Mesa, Mission Valley, and San Diego State University would be established. Double-tracking along the SPRINTER rail line through the cities of Oceanside, Vista, San Marco, and Escondido would take place by 2035 as well as continued double-tracking along the LOSSAN corridor.

Construction of the transportation network improvements would result in similar noise level impacts as identified under the regional growth/land use change discussion.

Conclusion

By 2035, construction of development projects implementing 2050 RTP/SCS growth/land use changes, and construction of transportation network improvements, would likely expose sensitive receptors to temporary increases in ambient noise levels exceeding 10 dBA above ambient noise levels. Therefore, this is a significant impact for which mitigation measures are described in Section 4.2.5.

2050

Regional Growth/Land Use Change

By 2050, the population of the region is forecast to increase by 1,160,435 people; housing by 379,664 units; and employment by 501,958 jobs over existing conditions. As shown in Figure 4.11-5, new growth and land use changes in 2050 per the 2050 RTP/SCS are apparent throughout the region. Areas of substantial land use change and development, beyond that described in 2035, would include significant industrial development in the County's Otay planning area and San Diego Otay Mesa community surrounding the East Otay Mesa POE; throughout County planning areas located along the international border including Tecate, Potrero, Campo/Lake Morena, Boulevard, and Jacumba; throughout the Ramona and Julian planning areas in the unincorporated County; throughout other northeastern County planning

areas including North Mountain, Desert, and Borrego Springs; and continued development throughout County planning areas located north and east of Escondido extending to the northern border with Riverside County including Rainbow, Fallbrook, Bonsall, Pala-Pauma Valley, Valley Center, Hidden Valley, Twin Oaks Valley, and North County Metro.

As with the 2020 and 2035 analyses, construction activities by 2050 associated with the 2050 RTP/SCS would result in temporary noise increases at nearby sensitive receptors. Impacts to sensitive receptors resulting from these proposed improvements would depend on several factors, such as the type of improvement, surrounding land uses in a given area, and duration of proposed construction activities. Additionally, construction noise levels would fluctuate depending on equipment type and duration of use; distance between noise source and receptor; and presence or absence of barriers between noise source and receptor. Typically, construction noise would attenuate to less than 60 dBA L_{eq} at distances of 500 feet or greater and would attenuate to 90 dBA L_{eq} or less at distances of 30 feet or greater. While noise levels along existing corridors can be assumed to range from 60 to 75 dBA depending on proximity, construction could still result in substantial temporary increase at these receptors. Additionally, noise level increases exceeding 10 dBA above ambient noise levels along routes with low existing activity or along new routes would be considered substantial. While, construction-related noise impacts would be short term and localized in nature, construction of development projects implementing the 2050 RTP/SCS could result in a substantial increase in short-term noise; thus, this impact would be significant.

~~(The mitigation measures described in Section 4.12.5 are not "required" until CEQA findings are adopted. At this point, they are potentially feasible mitigation measures.)~~

Transportation Network Improvements

By 2050, most of the highway, transit, and active transportation (bicycle and pedestrian) improvements, along with other infrastructure projects, would be in place and operational in accordance with the proposed 2050 RTP/SCS. Some key highway improvements that would be in place by 2050 would include widening portions of SR 52, SR 56, SR 76, SR 94, SR 125, and I-5; additional HOV lanes and Managed Lanes along segments of I-805, I-5, I-15, SR 94, SR 125, and SR 54; and freeway and HOV connector improvements. Important transit improvements in place by 2050 would include the extension of Trolley lines and increased Trolley service frequency. The Trolley Green Line would be extended to Downtown-Bayside; ~~a new~~ Phase 2 of the line connecting ~~San Diego State University to~~ Downtown San Diego to~~via~~ El Cajon Boulevard/Mid-City would be ~~constructed~~extended to San Diego State University; and a line from University Town Center to San Ysidro ~~Palomar Trolley Station in the South Bay~~ via Kearny Mesa, Mission Valley, Mid-City, ~~and~~ National City, and Chula Vista would be established.

Construction of the transportation network improvements would result in similar noise level impacts as identified under the regional growth/land use change discussion.

Conclusion

As with the 2020 and 2035 analyses, construction related to the increase in population, housing, and employment development expected by 2050 could result in substantial temporary noise level increases greater than 10 dBA at nearby sensitive receptors. While, compliance with the existing policies and regulations included in mitigation would limit noise levels from construction activities in the SANDAG region, compliance cannot guarantee that all future project-level impacts would be avoided or below a significant level. Therefore, this is a significant impact for which mitigation measures are described in Section 4.2.5.

N-5 FOR A PROJECT LOCATED WITHIN AN AIRPORT LAND USE PLAN OR WHERE SUCH A PLAN HAS NOT BEEN ADOPTED WITHIN 2 MILES OF A PUBLIC AIRPORT OR PUBLIC USE AIRPORT, EXPOSE PEOPLE RESIDING OR WORKING IN THE PROJECT AREA TO EXCESSIVE NOISE LEVELS

With limited exception, California law requires preparation of an Airport Land Use Compatibility Plan (ALUCP) for each public use airport in the state. As stated, there are 16 public use and military airports within the San Diego region. SDIA and McClellan-Palomar accommodate commercial, general aviation, and corporate air services. Brown Field Municipal, Gillespie Field, Montgomery Field, and Ramona airports are capable of accommodating corporate services as well as general aviation, while the remaining airports are general aviation only. Each of the 12 public airports has an adopted ALUCP. The ALUCP includes an analysis of the existing aircraft noise contours and an analysis of future aircraft noise contours (+20 years) to assist local agencies in developing land use plans for areas surrounding the airport.

2020

Regional Growth/Land Use Change

By 2020, population within the region is expected to increase by 310,568 people; housing by 113,062 units; and employment by 118,535 jobs. However, when comparing existing land use as shown in Figure 4.11-1 and 2020 land use as shown in Figure 4.11-3, there are no substantial differences in the land use patterns, types, or areas of development. Locations that would experience the most extensive land use change and development by 2020 would include areas such as eastern Chula Vista along the SR 125 and I-805 corridors; San Diego community planning areas of San Ysidro and Otay Mesa along the SR 905 corridor; City of San Diego coastal and bay communities south of I-8 including Ocean Beach and the Peninsula planning areas; portions of northern Santee; areas north and south of the SR 56 corridor in the San Diego planning areas of Carmel Valley, Del Mar Mesa, Pacific Highlands Ranch, and Torrey Highlands; the San Marcos area near both the SR 78 and I-15 corridors; and within unincorporated County communities such as Fallbrook, Pala-Pauma Valley, and Valley Center along the I-15 and SR 76 corridors.

Regional growth/land use change would potentially increase aircraft activity in the region. Regional growth/land use change envisioned under the 2050 RTP/SCS by 2020 would potentially increase activity regional airports access points; however, the 2050 RTC/SCS would not result in any operational changes (e.g., changes in flight patterns) to San Diego County airports.

To prevent incompatible uses in areas with higher aircraft noise levels, the ALUC has adopted ALUCPs with land use policies and criteria in the interest of aircraft noise and land use compatibility. As described in Sections 4.9.1 and 4.9.2, the SDCRAA, which is the ALUC for the SANDAG region, is required to assist local agencies in ensuring compatible land uses in the vicinity of existing or proposed airports; to coordinate planning at state, regional, and local levels; to prepare and adopt an airport land use plan as required by PRC Section 21675; to review plans or regulations submitted by local agencies; and to review and make recommendations regarding the land uses, building heights, and other issues relating to air navigation safety and promotion of air commerce. However, the recommendations of the ALUC are only advisory. Thus, the primary responsibility for integrating airport considerations into the local land use planning process rests with local governments.

ALUCPs include noise contours in 5 dBA increments typically ranging from 75 dBA CNEL to 60 dBA CNEL. The noise contours reflect the anticipated growth of the airport for at least the next 20 years and include potential development planning. ALUCPs and CLUPs differentiate allowed and prohibited land

uses according to a noise and land use compatibility guideline similar to that in shown Table 4.12-1. The Department of Defense requires military airfields to adopt Air Installation Compatible Use Zone (AICUZ) studies, which assess compatible land uses in the vicinity of a military air station in a way equivalent to ALUCPs. These contour maps are included in the noise element of each jurisdiction affected by public use and military airports and is considered in the development of land use plans at the local level.

Regional growth/land use change by 2020 would potentially increase aircraft activity and development near public use or military airports in the region. However, existing procedures ALUCPs, and AICUZ studies ensure compatibility between land uses and airports and reduce the potential for aircraft noise impacts. Additionally, the 2050 RTC/SCS is not anticipated to result in any operational changes (e.g., changes in flight patterns) to San Diego County airports; however, if a project would affect the operation of an airport, the project would be evaluated per FAA requirements. Furthermore, the 2050 RTP/SCS would not directly locate any noise-sensitive land uses in areas exposed to excessive aircraft noise levels. Therefore, regional growth/land use change associated with the 2050 RTP/SCS would not expose residents or employees to excessive noise levels from airports.

Transportation Network Improvements

The transportation network improvements that would be implemented between 2010 and 2020 generally include widening and/or installation of HOV lanes, ~~and~~ Managed Lanes, and Transit Lanes along portions of I-5, I-15, I-805, SR 78, and SR 94; completion of SR 905 and SR 11; and HOV connector projects along I-805 and SR 78 at I-15. Some key transit network improvements in place by 2020 would include increases in existing COASTER service, including extension of COASTER service to the San Diego Convention Center and Petco Park. BRT downtown express services from inland and south bay locations would be expanded as well as new BRT routes from the south bay area and along I-15. Rapid bus service would add new routes and streetcar routes would be established. Airport express routes would also be developed. Local bus service would be improved to 15 minutes in key corridors. Double-tracking of the LOSSAN rail corridor would occur to accommodate increased frequency in COASTER and other rail services that utilize this rail line. In addition, the new Mid-Coast Trolley line from Old Town to University Town Center would be constructed and the Green Trolley line would be extended to downtown San Diego.

The 2050 RTP/SCS includes a multimodal strategy to improve airport access for cars, shuttles, trucks and other surface transportation. Senate Bill 10 of 2007 (SB 10) requires airport multimodal planning to be conducted and coordinated by SANDAG and the SDCRAA. The main planning provisions of SB 10 include the development of a Regional Aviation Strategic Plan (RASP) and an Airport Multimodal Accessibility Plan (AMAP). The 2050 RTP/SCS incorporates both the RASP and the AMAP.

A key component of RASP is Destination Lindbergh, an integrated regional surface and air transportation planning effort centered on SDIA completed in February 2009. The AMAP includes a strategy to expand and add surface transportation (automobile, rail, bus, and future high-speed rail) to improve access to and from airports both within the SANDAG region and between neighboring regions. The RASP identifies strategies to improve the performance of the San Diego County regional airport system, with a focus on SDIA and McClellan-Palomar Airport, and providing cross-border service to Tijuana International Airport.

Many transportation improvements developed by 2020 would be located near public airports, particularly those identified in the RASP and the AMAP. Improvements to highways, rail lines, and arterials included in the 2050 RTP/SCS would not interfere with air traffic and cause an increase in exposure to aircraft noise on the ground. This impact is less than significant.

Conclusion

In 2020, development projects implementing the 2050 RP/SCS growth/land use changes could occur near public use or military airports; however, existing regulations, procedures, ALUCPs, and AICUZ studies would ensure compatibility between uses and reduce the potential for aircraft noise impacts. The proposed transportation network improvements would not involve changes in operations at public use or military airports and would not develop noise-sensitive land uses or employment centers; thus, proposed transportation projects would not expose future noise-sensitive land uses to excessive noise levels due to airport noise. Therefore, the 2050 RTP/SCS would not expose residents or employees to excessive airport noise levels, and this impact is less than significant.

2035

Regional Growth/Land Use Change

By 2035, the population of the region is expected to increase by 801,699 people; housing by 268,094 units; and employment by 312,292 jobs over existing 2010 conditions. As shown in Figures 4.11-4, 4.13-8, and 4.13-9, regional land use and growth changes are evident by 2035. Some locations that would experience the most extensive land use change and development by 2035 would include continued growth in eastern Chula Vista along the SR 125 and I-805 corridors; San Diego community planning areas of San Ysidro and Otay Mesa along the SR 905 and SR 125 corridors: northeast of the SR 94 corridor in the unincorporated County planning areas of Jamul/Dulzura, Tecate, and Potrero; eastern Poway along the SR 67 corridor; the County planning area of Ramona along the SR 67 and SR 78 corridors; County planning areas of Lakeside and Alpine and the Crest, Granite Hills, Dehesa, Harbison Canyon subregion; and multiple north County planning areas along the 1-15 and SR 76 corridors such as Rainbow, Fallbrook, Bonsall, Pala-Pauma Valley, Valley Center, and Hidden Valley.

Regional growth/land use change by 2035 would potentially increase aircraft activity and development near public use or military airports in the region. However, existing procedures ALUCPs, and AICUZ studies ensure compatibility between land uses and airports and reduce the potential for aircraft noise impacts. Additionally, the 2050 RTC/SCS is not anticipated to result in any operational changes (e.g., changes in flight patterns) to San Diego County airports; however, if a project would affect the operation of an airport, the project would be evaluated per FAA requirements. Furthermore, the 2050 RTP/SCS would not directly locate any noise-sensitive land uses in areas exposed to excessive aircraft noise levels. Therefore, regional growth/land use change associated with the 2050 RTP/SCS would not expose residents or employees to excessive noise levels from airports.

Transportation Network Improvements

Some key highway improvements in place by 2035 would include ~~continued widening along portions of I-5;~~ additional HOV and Managed Lanes along portions of I-5, I-15, I-805, and SR 52; widening of portions of SR 125 and SR 67; and additional freeway and HOV connector improvements. Some important transit projects operational by 2035 would include continued increases in COASTER service, increases in SPRINTER service, increases in downtown area streetcar service, and substantial increases in rapid bus service throughout the region. The Trolley Blue Line would be extended from UTC to Mira Mesa via Sorrento Mesa and Carroll Canyon; the Orange Line would be extended to Lindbergh Field; Phase 1 of the new Mid-City to Downtown San Diego line would provide service from the Mid-City transit station via El Cajon Boulevard to Downtown; and a new line from Pacific Beach to El Cajon via Kearny Mesa, Mission Valley, and San Diego State University would be established. Double-tracking along the SPRINTER rail line through the cities of Oceanside, Vista, San Marco, and Escondido would take place by 2035 as well as continued double-tracking along the LOSSAN corridor.

Additional transportation improvements would be constructed by 2035, including improvements that are part of the RASP and AMAP, such as an extension of the Trolley Orange Line to SDIA. As discussed in the 2020 analysis, transportation improvements included in the 2050 RTP/SCS would not develop noise-sensitive land uses or employment centers and would not interfere with air traffic or result in operational changes at public use or military airports. Therefore, transportation network improvements would not expose residents or employees to excessive noise levels from airports. Impacts would be less than significant without mitigation.

Conclusion

In 2035, development projects implementing the 2050 RTP/SCS growth/land use changes could occur near public use or military airports; however, existing regulations, procedures, ALUCPs, and AICUZ studies would ensure compatibility between uses and reduce the potential for aircraft noise impacts. The proposed transportation network improvements would not involve changes in operations at public use or military airports and would not develop noise-sensitive land uses or employment centers; thus, proposed transportation projects would not expose future noise-sensitive land uses to excessive noise levels due to airport noise. Therefore, the 2050 RTP/SCS would not expose residents or employees to excessive airport noise levels, and this impact is less than significant.

2050

Regional Growth/Land Use Change

By 2050, the population of the region is forecast to increase by 1,160,435 people; housing by 379,664 units; and employment by 501,958 jobs over existing conditions. As shown in Figure 4.11-5, new growth and land use changes in 2050 per the 2050 RTP/SCS are apparent throughout the region. Areas of substantial land use change and development, beyond that described in 2035, would include significant industrial development in the County's Otay planning area and San Diego Otay Mesa community surrounding the East Otay Mesa POE; throughout County planning areas located along the international border including Tecate, Potrero, Campo/Lake Morena, Boulevard, and Jacumba; throughout the Ramona and Julian planning areas in the unincorporated County; throughout other northeastern County planning areas including North Mountain, Desert, and Borrego Springs; and continued development throughout County planning areas located north and east of Escondido extending to the northern border with Riverside County including Rainbow, Fallbrook, Bonsall, Pala-Pauma Valley, Valley Center, Hidden Valley, Twin Oaks Valley, and North County Metro.

While regional growth/land use change by 2050 would potentially increase aircraft activity and development near public use or military airports in the region, existing procedures ALUCPs, and AICUZ studies ensure compatibility between land uses and airports and reduce the potential for aircraft noise impacts. Additionally, the 2050 RTC/SCS is not anticipated to result in any operational changes (e.g., changes in flight patterns) to San Diego County airports. However, if a project would affect the operation of an airport, the project would be evaluated per local noise compatibility requirements and per FAA requirements. Therefore, regional growth/land use change associated with the 2050 RTP/SCS would not expose residents or employees to excessive noise levels from airports.

Transportation Network Improvements

By 2050, most of the highway, transit, and active transportation (bicycle and pedestrian) improvements, along with other infrastructure projects, would be in place and operational in accordance with the proposed 2050 RTP/SCS. Some key highway improvements that would be in place by 2050 would include widening portions of SR 52, SR 56, SR 76, SR 94, SR 125, and I-5; additional HOV lanes and

Managed Lanes along segments of I-805, I-5, I-15, SR 94, SR 125, and SR 54; and freeway and HOV connector improvements. Important transit improvements in place by 2050 would include the extension of Trolley lines and increased Trolley service frequency. The Trolley Green Line would be extended to Downtown-Bayside; ~~a new~~ Phase 2 of the line connecting ~~San Diego State University to~~ Downtown San Diego to~~via~~ El Cajon Boulevard/Mid-City would be ~~constructed~~extended to San Diego State University; and a line from University Town Center to San Ysidro ~~Palomar Trolley Station in the South Bay~~ via Kearny Mesa, Mission Valley, Mid-City, ~~and~~ National City, and Chula Vista would be established.

As discussed in the 2020 and 2035 analyses, transportation improvements included in the 2050 RTP/SCS would not develop noise-sensitive land uses or employment centers and would not interfere with air traffic or result in operational changes at public use or military airports. Therefore, transportation network improvements would not expose residents or employees to excessive noise levels from airports. Impacts would be less than significant without mitigation.

Conclusion

In 2050, development projects implementing the 2050 RTP/SCS growth/land use changes could occur near public use or military airports; however, existing regulations, procedures, ALUCPs, and AICUZ studies would ensure compatibility between uses and reduce the potential for aircraft noise impacts. The proposed transportation network improvements would not involve changes in operations at public use or military airports and would not develop noise-sensitive land uses or employment centers; thus, proposed transportation projects would not expose future noise-sensitive land uses to excessive noise levels due to airport noise. Therefore, the 2050 RTP/SCS would not expose residents or employees to excessive airport noise levels, and this impact is less than significant.

N-6 FOR A PROJECT WITHIN THE VICINITY OF A PRIVATE AIRSTRIP, EXPOSE PEOPLE RESIDING OR WORKING IN THE PROJECT AREA TO EXCESSIVE NOISE LEVELS

Approximately 33 private airstrips/helipads are located within San Diego County. Noise-related impacts at private and special-use airports are substantially less because of lower activity levels compared to public use and military airports. Users of these private airstrips include medical facilities, law enforcement, corporations, and private individuals. Land use controls differ substantially between public airports and private airports. First, there are no AIA identified around these airports and land use restrictions are much less defined than with public airports. Private airstrips are not required to adopt an ALUCP. Second, Caltrans' Division of Aeronautics controls private and special-use airports through a permitting process, and is also responsible for regulating operational activities at these airports.

2020

Regional Growth/Land Use Change

By 2020, population within the region is expected to increase by 310,568 people; housing by 113,062 units; and employment by 118,535 jobs. However, when comparing existing land use as shown in Figure 4.11-1 and 2020 land use as shown in Figure 4.11-3, there are no substantial differences in the land use patterns, types, or areas of development. Locations that would experience the most extensive land use change and development by 2020 would include areas such as eastern Chula Vista along the SR 125 and I-805 corridors; San Diego community planning areas of San Ysidro and Otay Mesa along the SR 905 corridor; City of San Diego coastal and bay communities south of I-8 including Ocean Beach and the Peninsula planning areas; portions of northern Santee; areas north and south of the SR 56 corridor in the San Diego planning areas of Carmel Valley, Del Mar Mesa, Pacific Highlands Ranch, and Torrey Highlands; the San Marcos area near both the SR 78 and I-15 corridors; and within unincorporated

County communities such as Fallbrook, Pala-Pauma Valley, and Valley Center along the I-15 and SR 76 corridors.

A high rate of residential or commercial development is not projected to occur in rural areas of the region, where there are several private airstrips. However, regional growth is forecasted to occur near other private or special-use airstrips or helipads, such as hospitals and police stations. As required for safety zones, appropriate separation between private airports and land use development is identified in accordance with the California Airport Land Use Planning Handbook and FAA standards. Appropriate separation between project development and the airstrip or helipad would be identified in accordance with existing regulatory mechanisms. The existing regulations and FAA procedures would ensure compatibility between land uses and airports. Additionally, regional growth envisioned under the 2050 RTP/SCS is not anticipated to increase activity or access to private airstrips or result in any operational changes (e.g., changes in flight patterns) at any private airstrips. Therefore, regional growth developed by 2020 would not expose residents or employees to excessive noise levels from private airports. Impacts would be less than significant.

Transportation Network Improvements

The transportation network improvements that would be implemented between 2010 and 2020 generally include widening and/or installation of HOV lanes, ~~and~~ Managed Lanes, and Transit Lanes along portions of I-5, I-15, I-805, SR 78, and SR 94; completion of SR 905 and SR 11; and HOV connector projects along I-805 and SR 78 at I-15. Some key transit network improvements in place by 2020 would include increases in existing COASTER service, including extension of COASTER service to the San Diego Convention Center and Petco Park. BRT downtown express services from inland and south bay locations would be expanded as well as new BRT routes from the south bay area and along I-15. Rapid bus service would add new routes and streetcar routes would be established. Airport express routes would also be developed. Local bus service would be improved to 15 minutes in key corridors. Double-tracking of the LOSSAN rail corridor would occur to accommodate increased frequency in COASTER and other rail services that utilize this rail line. In addition, the new Mid-Coast Trolley line from Old Town to University Town Center would be constructed and the Green Trolley line would be extended to downtown San Diego.

Transportation improvements developed by 2020 would be located near private or special-use airports or helipads, particularly if they are located in the western portion of the region. Improvements to highways, rail lines, and arterials included in the 2050 RTP/SCS are unlikely to interfere with air traffic or result in aircraft noise impacts. If the location or other characteristics of a transportation project would potentially pose an impact on aircraft operations, the project would be evaluated per local compatibility and FAA requirements. Therefore, with adherence to regulations, regional growth developed by 2020 would not expose residents or employees to excessive noise levels from airports. Impacts would be less than significant.

Conclusion

Increased development and construction of transportation network improvements by 2020 would occur near private airstrips or helipads. However, the 2050 RTC/SCS would not result in any operational changes (e.g., changes in flight patterns) to private airstrips in San Diego County. If a project would affect the operation of an airport, the project would be evaluated per local compatibility and FAA requirements. With adherence to FAA and Caltrans regulations, noise impacts associated with airports would be reduced to less than significant. No mitigation is required.

2035

Regional Growth/Land Use Change

By 2035, the population of the region is expected to increase by 801,699 people; housing by 268,094 units; and employment by 312,292 jobs over existing 2010 conditions. As shown in Figures 4.11-4, 4.13-8, and 4.13-9, regional land use and growth changes are evident by 2035. Some locations that would experience the most extensive land use change and development by 2035 would include continued growth in eastern Chula Vista along the SR 125 and I-805 corridors; San Diego community planning areas of San Ysidro and Otay Mesa along the SR 905 and SR 125 corridors: northeast of the SR 94 corridor in the unincorporated County planning areas of Jamul/Dulzura, Tecate, and Potrero; eastern Poway along the SR 67 corridor; the County planning area of Ramona along the SR 67 and SR 78 corridors; County planning areas of Lakeside and Alpine and the Crest, Granite Hills, Dehesa, Harbison Canyon subregion; and multiple north County planning areas along the 1-15 and SR 76 corridors such as Rainbow, Fallbrook, Bonsall, Pala-Pauma Valley, Valley Center, and Hidden Valley.

By 2035, additional regional growth is forecasted to occur near private or special-use airstrips or helipads, particularly in the urbanized areas of the region. As described above, appropriate separation between project development and the airstrip or helipad would be identified in accordance with existing regulatory mechanisms. The FAA may condition certain requirements for project sites to ensure compatibility with air safety. Existing regulations and FAA procedures would ensure compatibility between land uses and airports and reduce the potential for aircraft noise impacts. Therefore, regional growth developed by 2035 would not expose residents or employees to excessive noise levels from airports. Impacts would be less than significant.

Transportation Network Improvements

Some key highway improvements in place by 2035 would include ~~continued widening along portions of I-5;~~ additional HOV and Managed Lanes along portions of I-5, I-15, I-805, and SR 52; widening of portions of SR 125 and SR 67; and additional freeway and HOV connector improvements. Some important transit projects operational by 2035 would include continued increases in COASTER service, increases in SPRINTER service, increases in downtown area streetcar service, and substantial increases in rapid bus service throughout the region. The Trolley Blue Line would be extended from UTC to Mira Mesa via Sorrento Mesa and Carroll Canyon; the Orange Line would be extended to Lindbergh Field; Phase 1 of the new Mid-City to Downtown San Diego line would provide service from the Mid-City transit station via El Cajon Boulevard to Downtown; and a new line from Pacific Beach to El Cajon via Kearny Mesa, Mission Valley, and San Diego State University would be established. Double-tracking along the SPRINTER rail line through the cities of Oceanside, Vista, San Marco, and Escondido would take place by 2035 as well as continued double-tracking along the LOSSAN corridor.

Transportation improvements developed by 2035 would be located near private or special-use airports or helipads, particularly if they are located in the western portion of the region. As discussed in the 2020 analysis, improvements to highways, rail lines, and arterials included in the 2050 RTP/SCS do not include noise-sensitive land uses or employment center and would not interfere with airport operations. Therefore, regional growth developed by 2035 would not expose residents or employees to excessive noise levels from airports. Impacts would be less than significant.

Conclusion

By 2035, increased development and construction of transportation network improvements would occur near private airstrips or helipads. However, as with the 2020 analysis, the 2050 RTC/SCS would not result in any operational changes to private airstrips in San Diego County. If a project would affect the

operation of an airport, the project would be evaluated per local compatibility and FAA requirements. Noise impacts associated with airports would less than significant. No mitigation is required.

2050

Regional Growth/Land Use Change

By 2050, the population of the region is forecast to increase by 1,160,435 people; housing by 379,664 units; and employment by 501,958 jobs over existing conditions. As shown in Figure 4.11-5, new growth and land use changes in 2050 per the 2050 RTP/SCS are apparent throughout the region. Areas of substantial land use change and development, beyond that described in 2035, would include significant industrial development in the County's Otay planning area and San Diego Otay Mesa community surrounding the East Otay Mesa POE; throughout County planning areas located along the international border including Tecate, Potrero, Campo/Lake Morena, Boulevard, and Jacumba; throughout the Ramona and Julian planning areas in the unincorporated County; throughout other northeastern County planning areas including North Mountain, Desert, and Borrego Springs; and continued development throughout County planning areas located north and east of Escondido extending to the northern border with Riverside County including Rainbow, Fallbrook, Bonsall, Pala-Pauma Valley, Valley Center, Hidden Valley, Twin Oaks Valley, and North County Metro.

By 2050, the additional regional growth forecasted would occur near private or special-use airstrips or helipads, particularly in the urbanized areas of the region. As described in the 2020 analysis, appropriate separation between project development and the airstrip or helipad would be identified in accordance with existing regulatory mechanisms. The FAA may condition certain requirements for project sites to avoid or reduce incompatibilities with surrounding land uses. Existing regulations and FAA procedures would ensure compatibility between land uses and airports. Therefore, with adherence to the regulations above, regional growth developed by 2050 would not expose residents or employees to excessive noise levels from airports. Impacts would be less than significant.

Transportation Network Improvements

By 2050, most of the highway, transit, and active transportation (bicycle and pedestrian) improvements, along with other infrastructure projects, would be in place and operational in accordance with the proposed 2050 RTP/SCS. Some key highway improvements that would be in place by 2050 would include widening portions of SR 52, SR 56, SR 76, SR 94, SR 125, and I-5; additional HOV lanes and Managed Lanes along segments of I-805, I-5, I-15, SR 94, SR 125, and SR 54; and freeway and HOV connector improvements. Important transit improvements in place by 2050 would include the extension of Trolley lines and increased Trolley service frequency. The Trolley Green Line would be extended to Downtown-Bayside; ~~a new~~ Phase 2 of the line connecting ~~San Diego State University to~~ Downtown San Diego to~~via~~ El Cajon Boulevard/Mid-City would be ~~constructed~~extended to San Diego State University; and a line from University Town Center to San Ysidro ~~Palomar Trolley Station in the South Bay~~ via Kearny Mesa, Mission Valley, Mid-City, ~~and~~ National City, and Chula Vista would be established.

Some of the transportation improvements developed by 2050 would be located near private or special-use airports or helipads, particularly if they are located in the western portion of the region. As discussed in the 2020 and 2035 analyses, improvements to highways, rail lines, and arterials included in the 2050 RTP/SCS do not include noise-sensitive land uses or employment center and would not interfere with airport operations. Therefore, regional growth developed by 2035 would not expose residents or employees to excessive noise levels from airports. Impacts would be less than significant.

Conclusion

By 2050, increased development and construction of transportation network improvements would occur near private airstrips or helipads. However, as with the 2020 and 2035 analyses, the 2050 RTC/SCS would not result in any operational changes (e.g., changes in flight patterns) to private airstrips in San Diego County. If a project would affect the operation of an airport, the project would be evaluated per local compatibility and FAA requirements. Thus, the 2050 RTP/SCS would not expose any residents or workers to excessive noise levels associated with private airports. No mitigation is required.

4.12.5 MITIGATION MEASURES

Implementation of the 2050 RTP/SCS would result in significant noise and vibration impacts in 2020, 2035, and 2050. The mitigation measures below aim to reduce these impacts. These mitigation measures are general and programmatic in nature, and would be refined in project-specific CEQA documents.

N-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.

Implementation of the 2050 RTP/SCS would result in significant noise exposure or persons to or generation of noise levels in excess of standards established in local general plans, noise ordinances, or applicable standards of other agencies in 2020, 2035, and 2050. Implementation of Mitigation Measures NOI-A, NOI-B and NOI-C would be required to reduce these impacts.

2020, 2035, 2050

NOI-A SANDAG shall and other implementing agencies responsible for design and operation of individual projects that would generate operational source noise from infrastructure changes (such as transit stations, electrical substations, etc.) can and should implement the following design features, in locations that are near noise-sensitive receptors:

- New and expanded permanent noise sources, such as transit stations, will receive a full project-level environmental acoustical analysis to ensure that noise level increases are within acceptable limits.
- Noise reduction components such as buffer zones, barriers, site design, and grade separation will be implemented as determined by project-level analysis to ensure that noise level increases are within acceptable limits.

Local governments can and should use any land use design practices such as buffer zones, barriers, site design, and grade separation techniques to ensure that noise levels are reduced to the extent feasible.

NOI-B SANDAG shall and other implementing agencies responsible for design and operation of individual projects that would generate transportation noise (i.e., transportation network improvements and other changes in service or changes to routes or infrastructure related to rail or motor vehicles) can and should implement the following design features, in locations that are near noise-sensitive receptors:

- New and expanded transit corridors and features such as new rail tracks, double-tracking, interstate ramps, transit stations, and transit-only lanes will receive a full project-level environmental acoustical analysis to ensure that noise level increases are within acceptable limits.
- Noise reduction components such as buffer zones, barriers, corridor routing, site design, grade separation, and electric-powered vehicles will be implemented as determined by project-level analysis to ensure that noise level increases are within acceptable limits. An analysis of alternative designs for noise reduction components ~~should also be completedare~~is also recommended.
- For all new at-grade rail crossings, Federal Rail Administration Quiet Zones requirements will be met and approved by both the FRA and the local government, as funding is available. Quiet Zones are at grade rail crossings that have met specific ~~Federal Rail Administration~~FRA safety criteria for reducing or eliminating the requirement for locomotives to blast their horns.

NOI-C SANDAG shall and other implementing agencies responsible for approval of or construction individual projects (both development projects and transportation network improvements) should implement the following mitigation measures to reduce noise levels generated by on-site construction-equipment**:**

- Where feasible, project construction and related activities shall occur during permitted hours in accordance with local jurisdiction regulations.
- Construction equipment will be properly maintained per manufacturers' specifications and fitted with the best available noise suppression devices (e.g., mufflers, silencers, wraps). All impact tools will be shrouded or shielded and all intake and exhaust ports on power equipment will be muffled or shielded.
- Construction equipment will not be idled for extended periods of time in the vicinity of noise-sensitive receptors.
- Fixed/stationary equipment (such as generators, compressors, rock crushers, and cement mixers) will be located as far as possible from noise-sensitive receptors.
- Provided that pile driving would be necessary for construction due to geological conditions, pile holes will be predrilled to the maximum feasible depth. Predrilling pile holes will reduce the number of blows required to completely seat the pile and will concentrate the pile driving activity closer to the ground where pile driving noise can be shielded more effectively by a noise barrier/curtain.

N-2 EXPOSURE OR PERSONS TO OR GENERATION OF EXCESSIVE GROUNDBORNE VIBRATION OR GROUNDBORNE NOISE LEVELS

Implementation of the 2050 RTP/SCS would result in significant noise exposure or persons to or generation of excessive groundborne vibration or groundborne noise levels in 2020, 2035, and 2050. In addition to implementation of Mitigation Measures NOI-A and NOI-B above, Mitigation Measure NOI-D would be required to reduce these impacts.

2020, 2035, 2050

NOI-D SANDAG shall and other implementing agencies can and should implement the following mitigation measures to reduce groundborne vibration and noise levels generated by on-site construction-equipment:

- When construction activity must take place within 45 feet of a sensitive receptor, smaller rubber-tired equipment will be used.
- If pile driving would be necessary for construction due to geological conditions within 290 feet of any sensitive receptor, pile holes will be predrilled to the maximum feasible depth. Predrilling pile holes will reduce the number of blows required to completely seat the pile and will concentrate the pile driving activity closer to the ground reducing pile diving vibration to a smaller area.

N-3 CAUSE A SUBSTANTIAL PERMANENT INCREASE IN AMBIENT NOISE LEVELS IN THE PROJECT VICINITY ABOVE EXISTING LEVELS.

Implementation of the 2050 RTP/SCS would cause a substantial permanent increase in ambient noise levels in the project vicinity above existing levels in 2020, 2035, and 2050. Implementation of Mitigation Measures NOI-A NOI-B, and NOI-C above would be required to reduce these impacts.

N-4 CAUSE A SUBSTANTIAL TEMPORARY OR PERIODIC INCREASE IN AMBIENT NOISE LEVELS IN THE PROJECT VICINITY ABOVE EXISTING LEVELS

Implementation of the 2050 RTP/SCS would cause a substantial temporary or periodic increase in ambient noise levels in the project vicinity above existing levels in 2020, 2035, and 2050. Implementation of Mitigation NOI-C above would be required to reduce these impacts.

4.12.6 SIGNIFICANCE AFTER MITIGATION

N-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.

2020, 2035, 2050

While implementation of Mitigation Measures NOI-A, NOI-B, and NOI-C would reduce direct and indirect impacts associated with the generation of noise levels in excess of standards established in local general plans or noise ordinances, no project-level site plans or implementation programs have been considered as part of the environmental review of the 2050 RTP. Without detailed operational data it cannot be ~~en~~assured that the proposed mitigation would reduce all impacts to a less than significant level. The mitigation outlined provides a framework for future project design to ensure that the maximum noise abatement can be implemented at the project level. However, because of the variability of transportation noise sources and the high population density and proximity to major proposed noise sources in San Diego County, Mitigation Measures NOI-A, NOI-B, and NOI-C still cannot guarantee that all new and expanded routes, services, and roadways would meet varying local noise standards. Therefore, direct and

indirect impacts related to the generation of noise levels in excess of standards established in local general plans or noise ordinances would remain **significant and unavoidable**.

N-2 EXPOSURE OR PERSONS TO OR GENERATION OF EXCESSIVE GROUNDBORNE VIBRATION OR GROUNDBORNE NOISE LEVELS

2020, 2035, 2050

While implementation of Mitigation Measure NOI-D would reduce direct and indirect impacts associated with the generation of construction vibration levels and Mitigation Measures NOI-A and NOI-B would reduce direct and indirect impacts associated with the generation of operation vibration levels in excess of standards established in local general plans or noise ordinances, no project-level site plans or implementation programs have been considered as part of the environmental review of the 2050 RTP. Without detailed construction and operations data it cannot be ensured that the proposed mitigation would reduce all vibration impacts to a less than significant level. The mitigation outlined provides a framework for future construction activities to ensure that the maximum noise abatement can be implemented at the project level. However, because of the variability of vibration sources and the high population density and proximity to major proposed construction areas in San Diego County, Mitigation Measures NOI-A, NOI-B, and NOI-D still cannot guarantee that all construction and operation activities would meet applicable vibration standards. Therefore, direct and indirect impacts related to the generation of vibration levels in excess of applicable standards remain **significant and unavoidable.**

N-3 CAUSE A SUBSTANTIAL PERMANENT INCREASE IN AMBIENT NOISE LEVELS IN THE PROJECT VICINITY ABOVE EXISTING LEVELS

2020, 2035, 2050

While implementation of Mitigation Measures NOI-A, NOI-B, and NOI-C would reduce direct and indirect impacts associated with the generation of noise levels in excess of standards established in local general plans or noise ordinances, no project-level site plans or implementation programs have been considered as part of the environmental review of the 2050 RTP. Without detailed operational data it cannot be ensured that the proposed mitigation would reduce all impacts to a less than significant level. The mitigation outlined provides a framework for future project design to ensure that the maximum noise abatement can be implemented at the project level. However, because of the variability of transportation noise sources and the high population density and proximity to major proposed noise sources in San Diego County, Mitigation Measures NOI-A, NOI-B, and NOI-C still cannot guarantee that all new and expanded routes, services, and roadways would meet varying local noise standards. Therefore, direct and indirect impacts related to the generation of noise levels in excess of standards established in local general plans or noise ordinances would remain **significant and unavoidable**.

N-4 CAUSE A SUBSTANTIAL TEMPORARY OR PERIODIC INCREASE IN AMBIENT NOISE LEVELS IN THE PROJECT VICINITY ABOVE EXISTING LEVELS

2020, 2035, 2050

While implementation of Mitigation Measure NOI-C would reduce direct and indirect impacts associated with a substantial temporary or periodic increase in ambient noise levels in the project vicinity above existing levels, no project-level site plans or implementation programs have been considered as part of the

environmental review of the 2050 RTP. Without detailed construction data it cannot be ensured that the proposed mitigation would reduce all impacts to a less than significant level. The mitigation outlined provides a framework for future construction activities to ensure that the maximum noise abatement can be implemented at the project level. However, because of the variability of construction noise sources and the high population density and proximity to major proposed construction areas in San Diego County, Mitigation Measure NOI-C still cannot guarantee that all construction actions would meet varying local noise standards. Therefore, direct and indirect impacts related to the generation of noise levels in excess of standards established in local general plans or noise ordinances would remain **significant and unavoidable**.

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