Appendix F

Noise Impact Analysis

NOISE IMPACT ANALYSIS

FOR

CITY OF INDIO
OLD TOWN/DOWNTOWN SPECIFIC PLAN

NOVEMBER 2016

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INTRODUCTION

This report describes terminology used to discuss noise and discusses and analyzes the ambient noise environment of the proposed Indio Downtown/Old Town Specific Plan (Specific Plan or Project). Noise impacts associated with implementation of the DSP are analyzed. Supporting materials from this report are located in Appendix A.

PROJECT SUMMARY

The proposed Specific Plan includes an area of roughly 0.3 square miles within the downtown area of Indio. The DSP is generally bounded by Indio Boulevard to the north, Highway 111 to the south, Jackson Street to the east, and Deglet Noor Street to the west.

The proposed Specific Plan would supersede the 1997 Old Town Indio Specific Plan with a plan that emphasizes a walkable and mixed-use environment that complements the City's Old Town characteristics while embracing newer development opportunities. The goal of the proposed Specific Plan is to encourage and promote economic development and revitalization to enhance the City's attractiveness to the local and regional marketplace. The proposed Specific Plan seeks to facilitate the adaptive reuse of existing structures and promote infill development vacant or underutilized properties. The Project would also facilitate and encourage residential mixed-use, commercial/retail, and transit-supportive development.

EXISTING SETTING

ACOUSTIC FUNDAMENTALS

Noise is generally defined as sound that is loud, disagreeable, or unexpected. Sound is mechanical energy transmitted in the form of a wave because of a disturbance or vibration. Sound levels are described in terms of both amplitude and frequency.

Amplitude

Amplitude is defined as the difference between ambient air pressure and the peak pressure of the sound wave. Amplitude is measured in decibels (dB) on a logarithmic scale. For example, a 65 dB source of sound, such as a truck, when joined by another 65 dB source results in a sound amplitude of 68 dB, not 130 dB (i.e., doubling the source strength increases the sound pressure by 3 dB). Amplitude is interpreted by the ear as corresponding to different degrees of loudness. Laboratory measurements correlate a 10 dB increase in amplitude with a perceived doubling of loudness and establish a 3 dB change in amplitude as the minimum audible difference perceptible to the average person.

Frequency

The frequency of a sound is defined as the number of fluctuations of the pressure wave per second. The unit of frequency is the Hertz (Hz). One Hz equals one cycle per second. The human ear is not equally sensitive to sound of different frequencies. For instance, the human ear is more sensitive to sound in the higher portion of this range than in the lower and sound waves below 16 Hz or above 20,000 Hz cannot be heard at all. To approximate the sensitivity of the human ear to changes in frequency, environmental sound is usually measured in what is referred to as "A-weighted decibels" (dBA). On this

scale, the normal range of human hearing extends from about 10 dBA to about 140 dBA. Common community noise sources and associated noise levels, in dBA, are depicted in Figure 1.

Addition of Decibels

Because decibels are logarithmic units, sound levels cannot be added or subtracted through ordinary arithmetic. Under the decibel scale, a doubling of sound energy corresponds to a 3-dB increase. In other words, when two identical sources are each producing sound of the same loudness, the resulting sound level at a given distance would be 3 dB higher than one source under the same conditions. For example, if one automobile produces a sound level of 70 dB when it passes an observer, two cars passing simultaneously would not produce 140 dB; rather, they would combine to produce 73 dB. Under the decibel scale, three sources of equal loudness together would produce an increase of 5 dB.

Sound Propagation & Attenuation

Geometric Spreading

Noise sources are generally characterized as either a localized source (i.e., point source) or a line source. Examples of point sources include construction equipment, vehicle horns, alarms, and amplified sound systems. Examples of a line sources include trains and on-road vehicular traffic. Sound from a point source propagates uniformly outward in a spherical pattern.

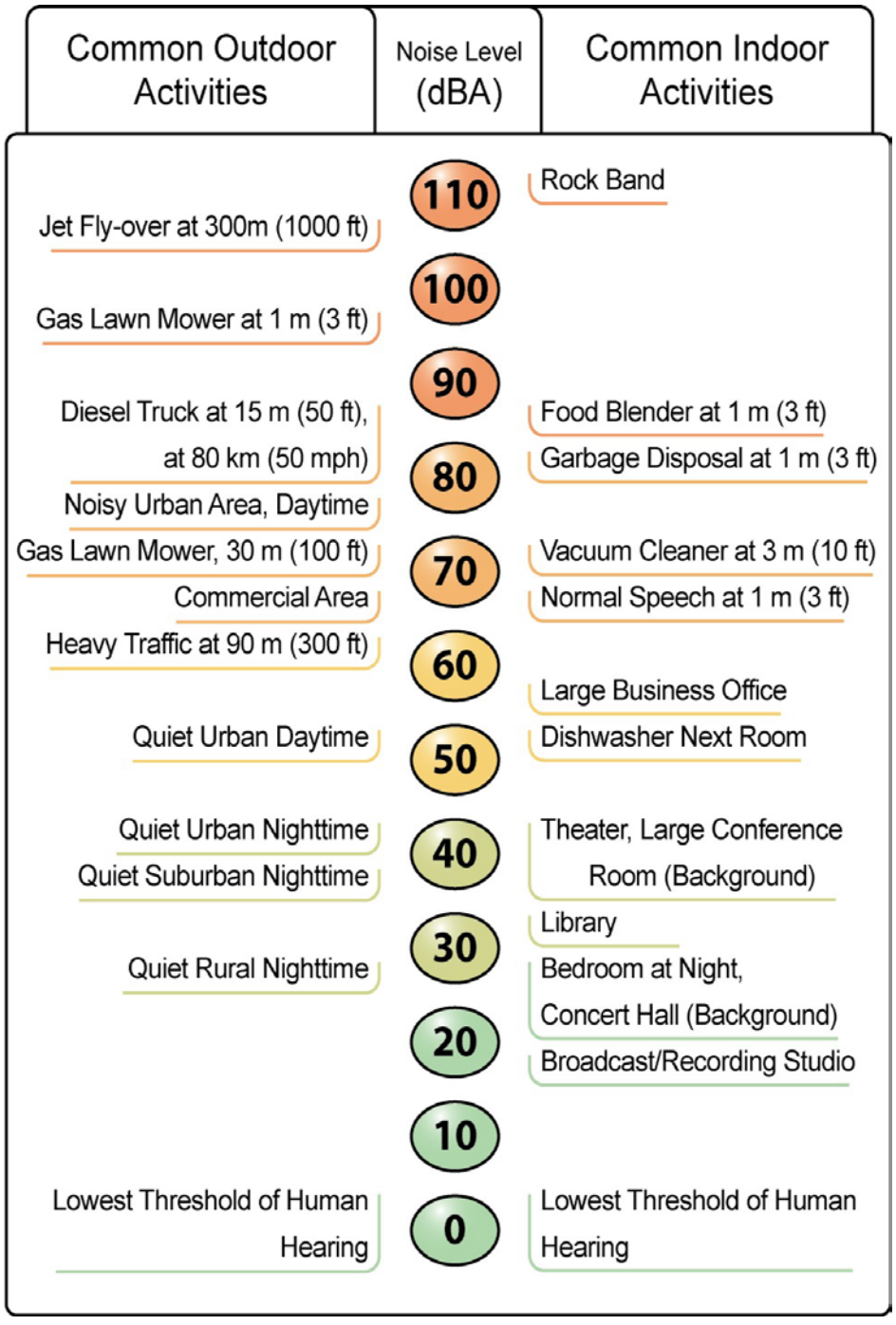
For a point source, sound levels generally decrease (attenuate) at a rate of approximately 6 decibels for each doubling of distance from the source, depending on ground surface characteristics. For acoustically hard sites (i.e., sites with a reflective surface between the source and the receiver), no excess ground attenuation is assumed. Parking lots and bodies of water are examples of hard surfaces which generally attenuate at this rate. For acoustically absorptive or soft sites (i.e., those sites with an absorptive ground surface between the source and the receiver, such as soft dirt, grass, or scattered bushes and trees), an excess ground-attenuation value of 1.5 decibels per doubling of distance is normally assumed. When soft surfaces are present, the excess ground attenuation for soft surfaces generally results in an overall attenuation rate of approximately 7.5 decibels per doubling of distance from the point source.

On-road vehicle traffic consists of several localized noise sources on a defined path, and hence can be treated as a line source, which approximates the effect of several point sources. Noise from a line source propagates outward in a cylindrical pattern, often referred to as cylindrical spreading. Sound levels for line sources attenuate at a rate of approximately 3 decibels for each doubling of distance for hard sites and approximately 4.5 decibels per doubling of distance for soft sites.

Atmospheric Effects

Receptors located downwind from a source can be exposed to increased noise levels relative to calm conditions, whereas locations upwind can have lowered noise levels. Sound levels can be increased at large distances (e.g., more than 500 feet) from the highway due to atmospheric temperature inversion (i.e., increasing temperature with elevation). Other factors such as air temperature, humidity, and turbulence can also have significant effects.

Figure 1
Common Noise Levels



Source: Caltrans 2015

Shielding by Natural or Human-Made Features

A large object or barrier in the path between a noise source and a receiver can substantially attenuate noise levels at the receiver. The amount of attenuation provided by shielding depends on the size of the object and the frequency content of the noise source. Natural terrain features (e.g., hills and dense woods) and human-made features (e.g., buildings and walls) can substantially reduce noise levels. Walls are often constructed between a source and a receiver specifically to reduce noise. A barrier that breaks the line of sight between a source and a receiver will typically result in minimum 5 dB of noise reduction. Taller barriers provide increased noise reduction.

Noise reductions afforded by building construction can vary depending on construction materials and techniques. Standard construction practices typically provide approximately 15 dBA exterior-to-interior noise reductions for building facades, with windows open, and approximately 20-25 dBA, with windows closed. With compliance with current building construction and insulation requirements, exterior-to-interior noise reductions typically average approximately 25 dBA. The absorptive characteristics of interior rooms, such as carpeted floors, draperies and furniture, can result in further reductions in interior noise.

Human Response to Noise

The human response to environmental noise is subjective and varies considerably from individual to individual. Noise in the community has often been cited as a health problem, not in terms of actual physiological damage, such as hearing impairment, but in terms of inhibiting general well-being and contributing to undue stress and annoyance. The health effects of noise in the community arise from interference with human activities, including sleep, speech, recreation, and tasks that demand concentration or coordination. Hearing loss can occur at the highest noise intensity levels. When community noise interferes with human activities or contributes to stress, public annoyance with the noise source increases. The acceptability of noise and the threat to public well-being are the basis for land use planning policies preventing exposure to excessive community noise levels.

Unfortunately, there is no completely satisfactory way to measure the subjective effects of noise or of the corresponding reactions of annoyance and dissatisfaction. This is primarily because of the wide variation in individual thresholds of annoyance and habituation to noise over differing individual experiences with noise. Thus, an important way of determining a person's subjective reaction to a new noise is the comparison of it to the existing environment to which one has adapted: the so-called "ambient" environment. In general, the more a new noise exceeds the previously existing ambient noise level, the less acceptable the new noise will be judged. Regarding increases in A-weighted noise levels, knowledge of the following relationships will be helpful in understanding this analysis:

- Except in carefully controlled laboratory experiments, a change of 1 dB cannot be perceived by humans;
- Outside of the laboratory, a 3-dB change is considered a just-perceivable difference;
- A change in level of at least 5 dB is required before any noticeable change in community response would be expected. An increase of 5 dB is typically considered substantial;
- A 10-dB change is subjectively heard as an approximate doubling in loudness and would almost certainly cause an adverse change in community response.

A limitation of using a single noise-level increase value to evaluate noise impacts, as discussed above, is that it fails to account for pre-development noise conditions. With this in mind, the Federal Interagency Committee on Noise (FICON) developed guidance to be used for the assessment of project-generated increases in noise levels that take into account the ambient noise level. The FICON recommendations are based upon studies that relate aircraft noise levels to the percentage of persons highly annoyed by aircraft noise. Although the FICON recommendations were specifically developed to assess aircraft noise impacts, these recommendations are often used in environmental noise impact assessments involving the use of cumulative noise exposure metrics, such as the average-daily noise level (i.e., CNEL, L_{dn}). FICON-recommended noise evaluation criteria are summarized in Table 1 (FICON 2000).

Table 1
Federal Interagency Committee on Noise
Recommended Criteria for Evaluation of Increases in Ambient Noise Levels

Ambient Noise Level Without Project	Increase Required for Significant Impact
< 60 dB	5.0 dB, or greater
60-65 dB	3.0 dB, or greater
> 65 dB	1.5 dB, or greater

Source: FICON 2000

As depicted in Table 1, an increase in the traffic noise level of 5.0, or greater, would typically be considered to result in increased levels of annoyance where existing ambient noise levels are less than 60 dB. Within areas where the ambient noise level ranges from 60 to 65 dB, increased levels of annoyance would be anticipated at increases of 3 dB, or greater. Increases of 1.5 dB, or greater, could result in increased levels of annoyance in areas where the ambient noise level exceeds 65 dB. The rationale for the FICON-recommended criteria is that as ambient noise levels increase, a smaller increase in noise resulting from a project is sufficient to cause significant increases in annoyance (FICON 2000). These criteria are commonly applied for analysis of environmental noise impacts.

NOISE-SENSITIVE LAND USES

Noise-sensitive land uses are generally considered to include those uses that would result in noise exposure that could cause health-related risks to individuals. Places where quiet is essential are also considered noise-sensitive uses. Residential dwellings are of primary concern because of the potential for increased and prolonged exposure of individuals to both interior and exterior noise levels. Other land uses such as libraries, places of worship, and recreation areas are also considered noise-sensitive land uses.

Noise-sensitive land uses within the Project area consist predominantly of residential land uses. Other noise-sensitive land uses located within the Project area include the Coachella Valley History Museum, the Indio Branch Library, places of worship, and community parks.

EXISTING NOISE ENVIRONMENT

Short-term (10-minute) noise level measurements were conducted on August 31, 2015 for the purpose of documenting and measuring the existing noise environment at various locations throughout the Project area. Measured daytime noise levels along area roadways ranged from approximately 59 to 72 dBA L_{eq}. In general, nighttime noise levels are typically 5-10 dB lower than daytime noise levels. Ambient noise levels are largely influenced by vehicle traffic on area roadways. Areas located near the

northern boundary of the Project area are also influenced by rail traffic along the Union Pacific Railroad (UPRR), which generally extends in a northwest-southeast direction, north of and roughly parallel to Indio Boulevard. Noise levels near the UPRR mainline measured approximately 78 dBA L_{eq} with instantaneous noise levels reaching 101 dBA L_{max} at roughly 100 feet from the rail corridor centerline. To a lesser extent, aircraft overflights and other stationary and area noise sources within the community, including construction activities, also contribute to the ambient noise environment. Ambient noise measurement locations and corresponding measured values (i.e., L_{eq} and L_{max}) are summarized in Table 2. Noise measurement locations are depicted in Figure 2.

Table 2
Summary of Measured Ambient Noise Levels

	Location[1]	Monitoring Period	Primary Noise Sources	Noise Levels (dBA)	
				L_{eq}	L_{max}
1	State Route 111 near Fargo Street, approximately 40 feet from road centerline.	0630-0643	Vehicle Traffic	67.3	85.6
2	State Route 111 near Towne Street, approximately 40 feet from road centerline.	0650-0700	Vehicle Traffic	67.5	79.3
		0700-0710	Vehicle Traffic	68.7	84.4
3	Indio Boulevard near Towne Street, approximately 50 feet from road centerline.	0715-0725	Vehicle Traffic	71.7	80.3
4	Oasis Street near Bliss Avenue, approximately 50 feet from road centerline.	0735-0740	Vehicle Traffic	59.3	68.9
5	Jackson Street near Civic Center Mall, approximately 50 feet from road centerline.	0750-0800	Vehicle Traffic	67.6	81.0
6	Indio Boulevard near Grace Street, approximately 50 feet from road centerline.	0810-0820	Vehicle Traffic	72.1	80.4
7	Greyhound Bus Terminal near Union Pacific Railroad, approximately 100 feet from rail corridor centerline.	0825-0845	Freight train pass by, train horns, train idling/track switching on spur line	78.3	101.3

Noise measurements were conducted on August 31, 2015 using a Larson Davis Model 820 Type I sound level meter.
1. Measurement locations are depicted in Figure 2.

Noise Sources

Surface Transportation Sources

Roadway Vehicular Traffic

As noted earlier in this report, noise from vehicular traffic on area roadways is a primarily source of ambient noise in the project area. Traffic noise levels for area roadways were calculated using the Federal Highway Administration (FHWA) Roadway Noise Prediction Model (FHWA RD-77-108) based on traffic volumes obtained from the traffic analysis prepared for this project. Predicted traffic noise levels and distances to projected traffic noise contours for major roadways are summarized in Table 3. It is important to note that projected traffic noise contours do not include attenuation or shielding provided by intervening structures. Based on the modeling conducted, existing traffic noise levels along area roadways range from approximately 53 to 67 dBA CNEL at 50 feet from the near-travel-lane centerline.

Figure 2
Noise Measurement Locations and Proposed Downtown/Old Town Specific Plan Area

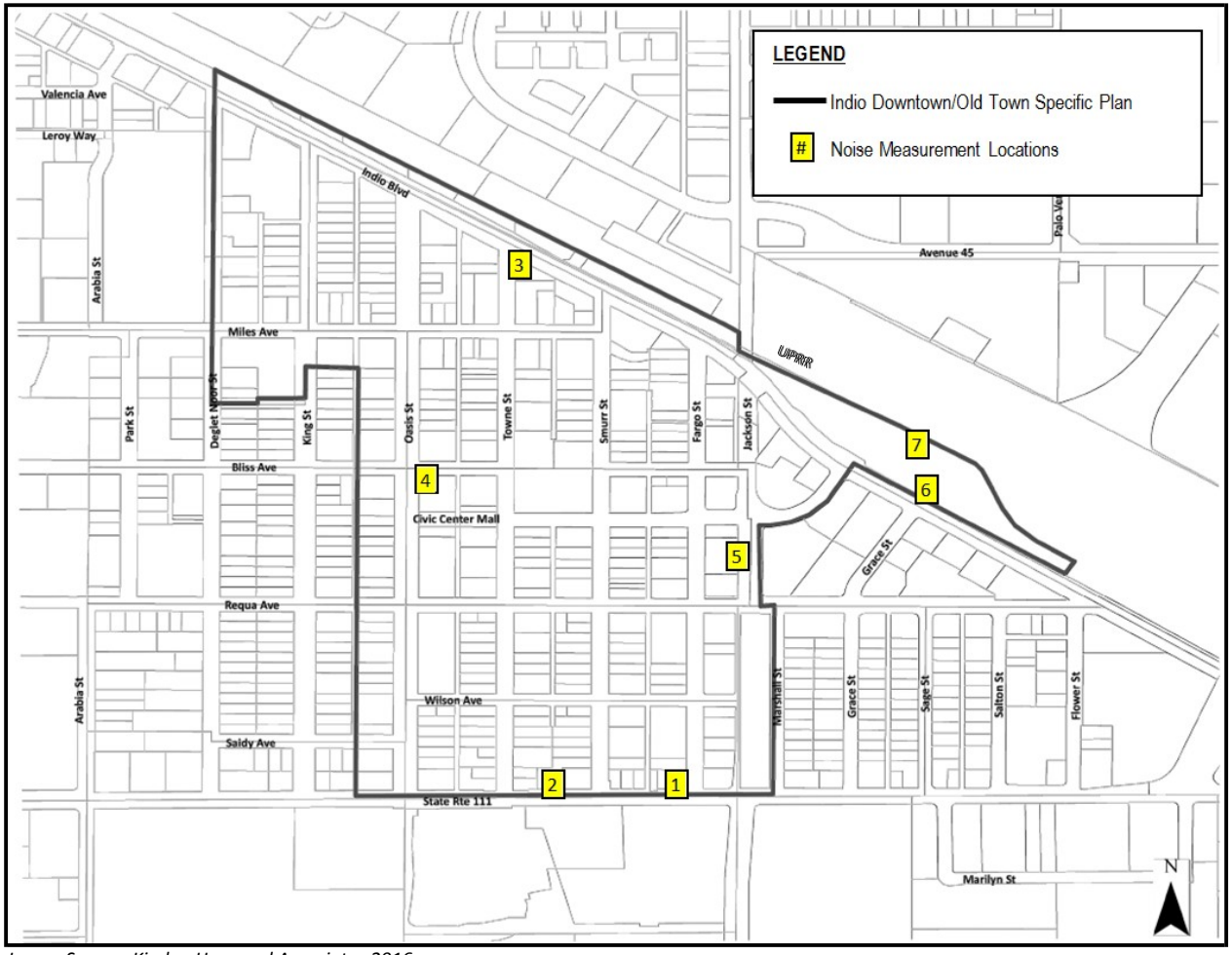


Image Source: Kimley-Horn and Associates 2016
Refer to Table 2 for noise measurement data

Table 3
Existing Roadway Traffic Noise Levels & Contour Distances

Roadway Segment	ADT Volumes	CNEL at 50 ft. from Near-travel-lane Centerline	Distance to CNEL Contour (Feet from Road Centerline)		
			70	65	60
Indio Boulevard, West of Oasis Street	17,750	67.2	61	114	237
Indio Boulevard, East of Oasis Street	15,820	66.8	WR	WR	211069
Oasis Street, South of Indio Boulevard	2,850	53.4	WR	WR	WR
Oasis Street, North of Requa Avenue	5,140	56.0	WR	WR	WR
Oasis Street, South of Requa Avenue	5,180	56.0	WR	WR	WR
Requa Avenue, East of Oasis Street	3,630	56.3	WR	WR	WR
Jackson Street, North of Requa Avenue	11,120	64.0	WR	74	145
Jackson Street, North of SR-111	8,680	62.9	WR	65	124
SR-111, West of Jackson Street	8,320	61.5	WR	WR	98

Traffic noise levels for area roadways were calculated based on data obtained from the traffic analysis prepared for this project. Assumes peak-hour traffic volumes are roughly 10 percent of average-daily traffic volumes. Predicted noise contours do not include shielding by intervening structures.
Source: Kimley-Horn and Associates, Inc., 2016

Railroad Traffic

The UPRR main line is generally located along the northern boundary of the planning area, roughly parallel to and north of Indio Boulevard. Roughly 45 freight trains currently travel along this corridor over a 24-hour period. Freight trains average approximately four engines and 80 cars per train traveling at a speed of roughly 50 miles per hour (Kern 2015). The number of freight trains and hours of operation can vary depending on market demands. Approximately two Amtrak trains also utilize this rail corridor on a daily basis (Amtrak 2015). Average-daily noise levels along this rail corridor are largely dominated by freight trains.

Existing train noise levels and corresponding distances to noise contours for the railroad corridor were calculated in accordance with the Federal Transit Administration's *Transit Noise and Vibration Impact Assessment* guidance (FTA 2006). Based on the volumes noted above, average-daily train noise levels along the railroad corridor would be approximately 72 dBA CNEL at roughly 100 feet from the rail corridor centerline. The existing 70 dBA CNEL train noise contour would extend to a distance of approximately 145 feet from the rail corridor centerline. The existing 65 CNEL and 60 CNEL train noise contours would extend to distances of approximately 315 and 680 feet, respectively; from the rail corridor centerline (refer to Table 4). Train noise events can also be a source of intermittent noise, including noise generated by locomotive engines, wheel squeal, and warning horns. These instantaneous noise events can contribute to increased levels of annoyance to occupants of nearby noise-sensitive land uses.

Table 4
Existing Railroad Traffic Noise Levels

Trains	CNEL at 100 feet from Rail Corridor Centerline	Distance to CNEL Contours (feet) from Rail Corridor Centerline		
		70	65	60
UPRR Freight & Amtrak Passenger	72	145	315	680

Assumes 45 freight trains and two Amtrak passenger trains distributed equally over a 24-hour period. Sources: SCAG 2013, Kern 2015, Amtrak 2015

Aircraft Overflights

There are no airports or airfields located in the vicinity of the project area. The nearest airport is the Bermuda Dunes Airport located roughly 3 miles to the northwest and the Thermal Airport located roughly 6 miles to the southeast. The Palm Springs International Airport is located roughly 17 miles to the northwest.

The project area is not located within the projected noise contours of these airports. As a result, aircraft operations do not contribute substantially to the average-daily noise environment within the project area. However, although no airports or airfields are located in the project area, noise generated by aircraft overflights may be noticeable, particularly during the quieter nighttime hours. In addition, helicopter overflights may also contribute to intermittent increases in ambient noise levels. Intermittent noise events associated with aircraft overflight may result in increases in annoyance and potential sleep disruption to occupants of nearby residential dwellings.

Stationary Sources

From a land-use planning perspective, stationary-source noise control issues focus on two goals: (1) preventing the introduction of new noise-producing uses in noise-sensitive areas; and (2) preventing encroachment of noise-sensitive uses upon existing noise-producing facilities. The first goal can be achieved by applying noise performance standards to proposed new noise producing uses. The second goal can be met by requiring that new noise-sensitive uses near noise-producing facilities include mitigation measures to ensure compliance with noise performance standards. Each of these goals stresses the importance of avoiding the location of new uses that may be incompatible with adjoining uses.

Within the planning area, non-transportation noise sources are predominantly associated with commercial use activities. Depending on the type of operation, noise sources associated with commercial activities may include mechanical equipment, loading and unloading of vehicles and trucks, as well as amplified or unamplified communications. To a lesser extent, stationary sources of noise may also include common building or home mechanical equipment, such as air conditioners and ventilation systems. These noise sources can be continuous or intermittent and may contain tonal components that are annoying to individuals who live nearby. For instance, backup alarms are often considered nuisance noise sources, but may not occur frequently enough to be considered incompatible with noise-sensitive land uses. Noise generated by stationary sources are often directional and can vary depending on various factors, including site conditions, distance from source, shielding provided by intervening terrain and structures, and ground attenuation rates.

Construction Activities

Construction noise typically occurs intermittently and varies depending upon the nature or phase (e.g., demolition/land clearing, grading and excavation, erection) of construction. Noise generated by construction equipment, including pile drivers, material handling equipment, pavers, jackhammers, and portable generators, can result in intermittent and prolonged increases in ambient noise levels. Although construction noise impacts are generally short-term, they can result in increased levels of annoyance to occupants of nearby residential dwellings. Noise-generating construction activities are currently regulated through implementation of the City's Noise Control ordinance, which generally limits these activities to the less noise-sensitive daytime hours.

REGULATORY SETTING

Federal, state, and local governments have established noise standards and guidelines to protect citizens from potential hearing damage and various other adverse physiological and social effects associated with noise. Those regulations most applicable to the community are summarized, as follows:

FEDERAL

U.S. Environmental Protection Agency

In 1974, the U.S. Environmental Protection Agency (EPA) Office of Noise Abatement and Control published a report entitled *Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety*. Although this document does not constitute EPA regulations or standards, it is useful in identifying noise levels at which increased levels of annoyance would be anticipated. Based on an annual-average day-night noise level (expressed as L_{dn} or DNL), the document states that "undue interference with activity and annoyance" will not occur if outdoor noise levels in residential areas are below 55 dBA L_{dn} and indoor levels are below 45 dBA L_{dn} (EPA 1974).

Department of Housing and Urban Development

The Federal Department of Housing and Urban Development (HUD) guidelines for the acceptability of residential land uses are set forth in the Code of Federal Regulations, Title 24, Part 51, "Environmental Criteria and Standards." These guidelines identify a noise exposure of 65 dBA L_{dn}, or less, as acceptable. Exterior noise levels of 65 to 75 dBA L_{dn} are considered normally acceptable, provided appropriate sound attenuation is provided to reduce interior noise levels to within acceptable levels. Exterior noise levels above 75 dBA L_{dn} are considered unacceptable. The goal of the interior noise levels for residential, hotel, and hospital/nursing home uses is 45 dBA L_{dn}. These guidelines apply only to new construction supported by HUD grants and are not binding upon local communities.

STATE

California Building Code

Title 24 of the California Code of Regulations contains standards for allowable interior noise levels associated with exterior noise sources (California Building Code, 1998 edition, Volume 1, Appendix Chapter 12, Section 1208A). The standards apply to new hotels, motels, dormitories, apartment houses, and dwellings other than detached single-family residences. The standards state that the interior noise level attributable to exterior sources shall not exceed 45 dBA CNEL in any habitable room. Proposed multi-family residential structures to be located where the CNEL exceeds 60 dBA shall require an acoustical analysis showing that the proposed building design would achieve the prescribed allowable interior noise standard.

State of California General Plan Guidelines

The *State of California General Plan Guidelines* (State of California 2003), published by the Governor's Office of Planning and Research (OPR), also provides guidance for the acceptability of projects within specific noise environments. Based on these guidelines, residential uses, churches, libraries, and hospitals are "normally unacceptable" in areas where the exterior noise level exceeds 70 dBA CNEL and "conditionally acceptable" within exterior noise environments between 60 and 70 dBA CNEL. Noise levels of up to 60 dBA CNEL are considered "normally acceptable". The goal of these noise standards is,

in part, to allow for a "normally acceptable" interior noise level of 45 dBA CNEL. For instance, assuming an average exterior-to-interior noise reduction of 15 dBA (with windows partially open), an exterior noise level of 60 dBA CNEL, or less, would be sufficient to achieve an interior noise level of 45 dBA CNEL. Higher exterior noise levels may be allowed provided that noise-reduction measures are incorporated to achieve acceptable interior noise levels. Within "conditionally acceptable" exterior noise environments, conventional construction with incorporation of fresh air circulation systems sufficient to allow windows to remain closed would normally suffice. Compliance with current building code requirements and with windows closed, exterior-to-interior noise reductions typically average approximately 25 dBA or more. However, the state stresses that these guidelines can be modified to reflect communities' sensitivities to noise. Adjustment factors may also be used in order to arrive at noise acceptability standards that reflect the noise control goals of the community, the particular community's sensitivity to noise, and the community's assessment of the relative importance of noise pollution. The State recommended noise criteria for land use compatibility are summarized in Figure 3.

LOCAL

Indio General Plan 2020 Noise Element

The existing Noise Element of the *Indio General Plan 2020* (1993) includes noise standards intended to ensure compatibility of proposed land uses within exterior noise environments and that noise levels at adjacent land uses do not exceed acceptable levels, which are consistent with those identified in the State of California General Plan Guidelines (Figure 5). The City's General Plan also includes the following noise-related policies:

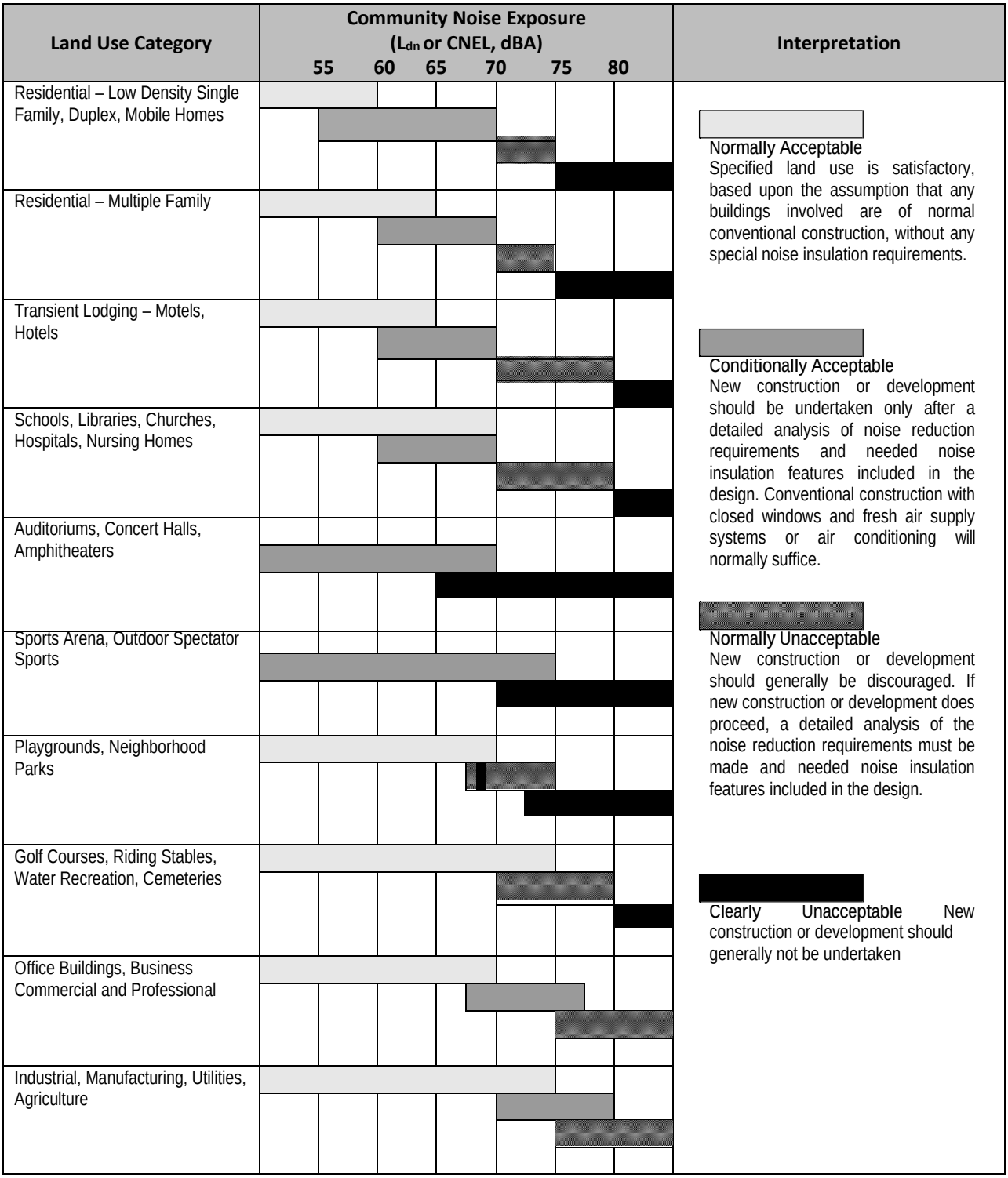
- NOI-1.1: Prohibit the development of new commercial, industrial, or other noise-generating land use adjacent to existing residential uses and sensitive noise receptors such as schools, health care facilities, libraries, and churches if noise levels are to exceed 65 dBA CNEL.
- NOI-1.2: Ensure that excessive noise levels do not interfere with sleep through implementation of land use requirements.
- NOI-1.3: Ensure that exterior noise levels for dwellings in residential areas do not exceed noise levels of 65 dBA CNEL and interior noise levels of 45 dBA CNEL.
- NOI-1.4: Work with railroad operators to provide noise barriers in areas that may impact sensitive noise receptors.
- NOI-1.6: Provide guidelines to contractors for reducing noise impacts on surrounding land uses.

The City of Indio General Plan is currently being updated. The proposed General Plan Update (GPU) includes land use compatibility standards for proposed land uses. The GPU land use compatibility standards are depicted in Figure 4.

City of Indio Municipal Code

The City of Indio Municipal Code (Title IX, General Regulations, Chapter 95C, Noise Control) includes various provisions intended to protect community residents from prolonged unnecessary, excessive, and annoying sound levels that are detrimental to the public health, welfare, and safety, or are contrary to the public interest. Examples of noise sources subject to the City's municipal Code include, but are not limited to, industrial and commercial machinery and equipment, pumps, fans, compressors, generators, air conditioners and refrigeration equipment.

Figure 3
State of California
Land Use Compatibility Noise Criteria



Source: California GOPR 2003

Figure 4
Proposed City of Indio General Plan Update
Land Use Compatibility Matrix

Land Use Category		Exterior Noise Level (CNEL)						
		50	55	60	65	70	75	80
A	Residential – single family residences, mobile homes, senior housing, convalescent homes							
B	Residential – multi-family residences, mixed-use (commercial/residential)							
C	Transient lodging – motels, hotels, resorts							
D	Schools, churches, hospitals, nursing homes, child care facilities							
E	Passive recreational parks, nature preserves, contemplative spaces, cemeteries							
F	Active parks, golf courses, athletic fields, outdoor spectator sports, water recreation							
G	Office/professional, government, medical/ dental, commercial, retail, laboratories							
H	Industrial, manufacturing, utilities, agriculture, mining, stables, ranching, warehouse, maintenance/repair							

ACCEPTABLE (A) – Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal construction, without any special noise insulation requirements.

CONDITIONALLY ACCEPTABLE (CA) – New construction or development should be undertaken only after a detailed noise analysis is conducted to determine if noise reduction measures are necessary to achieve acceptable levels for land use. Criteria for determining exterior and interior noise levels are listed in Table N-2, Noise Standards. If a project cannot mitigate noise to a level deemed Acceptable, the appropriate county decision-maker must determine that mitigation has been provided to the greatest extent practicable or that extraordinary circumstances exist.

UNACCEPTABLE (U) – New construction or development shall not be undertaken.

Source: City of Indio 2016

According to Section 159.107.H.1 (Exterior Noise Limits) of the Indio Municipal Code, no person shall operate or cause to be operated any source of sound or allow the creation of sound or noise which causes the noise level measured on any other property to exceed 45 decibels, except that noise levels may range up to 65 decibels during the times set forth as follows:

a. Pacific Standard Time:
   1. Monday through Friday, 7:00 a.m. to 6:00 p.m.
   2. Saturday, 8:00 a.m. to 6:00 p.m.
   3. Sunday, 9:00 a.m. to 5:00 p.m.
   4. Government Code holidays, 9:00 a.m. to 5:00 p.m.

b. Pacific Daylight Time:
   1. Monday through Friday, 6:00 a.m. to 6:00 p.m.
   2. Saturday, 7:00 a.m. to 6:00 p.m.
   3. Sunday, 9:00 a.m. to 5:00 p.m.
   4. Government Code holidays, 9:00 a.m. to 5:00 p.m.

The noise ordinance does not identify noise level limit standards applicable to construction-related activities. However, the noise ordinance does establish hourly limitations for construction activities. In accordance with Section 95C.08.B, noise sources associated with construction-related activities are limited to between the following hours:

a. Pacific Standard Time.
   1. Monday through Friday, 7:00 a.m. through 6:00 p.m.
   2. Saturday, 8:00 a.m. through 6:00 p.m.
   3. Sunday, 9:00 a.m. through 5:00 p.m.
   4. Government Holidays, 9:00 a.m. through 5:00 p.m.

b. Pacific Daylight Time.
   1. Monday through Friday, 6:00 a.m. through 6:00 p.m.
   2. Saturday, 7:00 a.m. through 6:00 p.m.
   3. Sunday, 9:00 a.m. through 5:00 p.m.
   4. Government Holidays, 9:00 a.m. through 5:00 p.m.

IMPACTS AND MITIGATION MEASURES

SIGNIFICANCE THRESHOLD CRITERIA

According to Appendix G of the CEQA Guidelines, a project would normally have a significant effect on the environment if the project would:

NOI-1: Result in exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance or of applicable standards of other agencies.

NOI-2: Result in exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels.

NOI-3: Result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project.

NOI-4: Result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.

NOI-5: Expose people residing or working in the project area to excessive noise levels for a project located within an airport land use plan area or, where such a plan has not been adopted, or within two miles of a public airport or a public use airport.

NOI-6: Expose people residing or working in the project area to excessive noise levels for a project within the vicinity of a private airstrip.

The Project area is not located within an airport land use plan area. Implementation of the proposed project would not expose people residing or working in the project area to excessive noise levels. As a result, no impact is anticipated to occur with regard to the exposure of sensitive receptors to aircraft noise levels. Therefore, impact related to thresholds NOI-5 and NOI-6 are not discussed further in this report.

METHODOLOGY

A combination of use of existing literature and general application of accepted noise thresholds was used to determine the impact of ambient noise levels resulting from and on development within the General Plan Planning Area. Short- and long-term impacts associated with transportation and non-transportation noise sources were qualitatively assessed based on potential increases in ambient noise levels anticipated to occur at noise-sensitive land uses. Traffic noise levels along major area roadways were estimated using the FHWA Highway Traffic Noise Prediction model (FHWA-RD-77-108.) The FHWA modeling was based upon the Calveno noise-emission factors for automobiles and medium- and heavy-duty trucks. Input data used in the model included average-daily traffic volumes, day/night percentages of automobiles and medium and heavy trucks, vehicle speeds, ground attenuation factors, roadway widths, and ground elevation data. Traffic volumes for major roadway segments within the City were derived from the traffic analysis prepared for this project.

Predicted train noise levels and corresponding distances to noise contours for the BNSF railroad corridor were calculated in accordance with the Federal Transit Administration's *Transit Noise and Vibration Impact Assessment* guidance (FTA 2006). Train noise levels were quantified for UPRR freight and Amtrak passenger trains. Predicted train volumes and operational data were obtained from UPRR staff, as well as, current Amtrak schedules and time tables. Projected future 2035 train volumes for this corridor were derived from the Southern California Association of Government's report entitled: *On the Move. Southern California Delivers the Goods. Comprehensive Regional Goods Movement Plan and Implementation Strategy. Final Report (2013)*.

IMPACTS AND MITIGATION MEASURES

Exposure to Construction Noise

Impact 1: *Demolition and construction activities associated with the proposed Specific Plan could result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project and could result in exposure of persons to or generation of noise levels in excess of applicable standards. This impact is considered* ***potentially significant*****. [Thresholds NOI-1 & NOI-4]**

While the project area is generally fully developed, future development may include demolition and/or construction activities in proximity to existing land uses. Demolition and construction-generated noise levels could adversely affect nearby land uses.

Construction noise typically occurs intermittently and varies depending upon the nature or phase (e.g., demolition/land clearing, grading and excavation, erection) of construction. Noise generated by construction equipment, including earth movers, material handlers, and portable generators, can reach high levels. Temporary increases in ambient noise levels, particularly during the nighttime hours, could result in increased levels of annoyance and potential sleep disruption. Although noise ranges were found to be similar for all construction phases, the grading phase tends to involve the most equipment and resulted in slightly higher average-hourly noise levels. Typical noise levels for individual pieces of construction equipment and distances to predicted noise contours are summarized in Table 5.

As depicted in Table 5, individual equipment noise levels typically range from approximately 74 to 88 dBA L_{eq} at 50 feet. Typical operating cycles may involve 2 minutes of full power, followed by 3 or 4 minutes at lower settings. Intermittent noise levels can range from approximately 77 to 95 dBA L_{max}, the loudest of which include the use of pile drivers and impact devices (e.g., hoe rams, impact hammers).

Table 5
Typical Construction Equipment Noise

Equipment	Typical Noise Level (dBA) 50 feet from Source		Distance to Noise Contours (feet, dBA L_{eq})		
	L_{max}	L_{eq}	70 dBA	65 dBA	60 dBA
Air Compressor	80	76	105	187	334
Auger/Rock Drill	85	78	133	236	420
Backhoe/Front End Loader	80	76	105	187	334
Blasting	94	74	83	149	265
Boring Hydraulic Jack/Power Unit	80	77	118	210	374
Compactor (Ground)	80	73	74	133	236
Concrete Batch Plant	83	75	94	167	297
Concrete Mixer Truck	85	81	187	334	594
Concrete Mixer (Vibratory)	80	73	74	133	236
Concrete Pump Truck	82	75	94	167	297
Concrete Saw	90	83	236	420	748
Crane	85	77	118	210	374
Dozer/Grader/Excavator/Scraper	85	81	187	334	594
Drill Rig Truck	84	77	118	210	374
Generator	82	79	149	265	472
Gradall	85	81	187	334	594
Hydraulic Break Ram	90	80	167	297	529
Jack Hammer	85	78	133	236	420
Impact Hammer/Hoe Ram (Mounted)	90	83	236	420	748
Pavement Scarifier/Roller	85	78	133	236	420
Paver	85	82	210	374	667
Pile Driver (Impact/Vibratory)	95	88	420	748	1,330
Pneumatic Tools	85	82	210	374	667
Pumps	77	74	83	149	265
Truck (Dump/Flat Bed)	84	80	167	297	529
Sources: FTA 2006, FHWA 2008					

Assuming a construction noise level of 88 dBA L_{eq} and an average attenuation rate of 6 dBA per doubling of distance from the source, construction activities located within approximately 1,330 feet of noise-sensitive receptors could reach levels of approximately 60 dBA L_{eq}. Depending on distances from nearby noise-sensitive land uses and the specific construction activities conducted, construction activities may result in temporary and periodic increases in ambient noise levels at nearby receptors.

The City has not identified noise level limits for short-term demolition and construction activities. However, the FTA has identified criteria that is considered reasonable for general noise assessment purposes. Based on these criteria, noise-generating construction activities would be considered to have a potentially significant short-term impact if average-hourly noise levels would exceed 90 dBA Leq at residential uses or 100 dBA Leq at commercial/industrial uses during the daytime hours (FTA 2006). Depending on the distance to nearby land uses, predicted demolition and construction noise levels could potentially exceed 90 dBA L_{eq} for residential land uses or 100 dBA Leq at nearby commercial/industrial uses. In addition, construction activities that occur during the more noise-sensitive nighttime hours may result in increased levels of annoyance and potential sleep disruption to occupants of nearby noise-sensitive land uses. As a result, this impact is considered ***potentially significant***.

Mitigation Measures

MM Noise-1. The City shall ensure that future demolition and construction activities occur in accordance with applicable regulations and, if necessary, shall require implementation of site-specific noise reduction measures to minimize impacts to nearby land uses. Mitigation measures typically implemented to reduce construction-related impacts include, but are not limited to, the following:

- Utilize best available noise control techniques for construction equipment, including the use of intake silencers, mufflers, and engine shrouds.
- To the extent locally available, utilize quieter construction techniques and alternatively powered equipment, such as electrically powered equipment.
- Stationary construction equipment, such as power generators, should be located as far from adjacent sensitive receptors as possible.
- Use of portable barriers or other measures as determined by the City (or other appropriate government agency) when demolition or construction activities are expected to exceed 90 dBA L_{eq} at nearby noise-sensitive receptors.

MM Noise-2. Noise-generating construction activities shall be limited to the hours set forth in Section 95C.08.B of the City's municipal code:

a. Pacific Standard Time.
   1. Monday through Friday, 7:00 a.m. through 6:00 p.m.
   2. Saturday, 8:00 a.m. through 6:00 p.m.
   3. Sunday, 9:00 a.m. through 5:00 p.m.
   4. Government Holidays, 9:00 a.m. through 5:00 p.m.

b. Pacific Daylight Time.
   1. Monday through Friday, 6:00 a.m. through 6:00 p.m.
   2. Saturday, 7:00 a.m. through 6:00 p.m.
   3. Sunday, 9:00 a.m. through 5:00 p.m.
   4. Government Holidays, 9:00 a.m. through 5:00 p.m.

Significance after Mitigation

Due to the short-term and intermittent frequency of construction noise, and the required compliance with the proposed mitigation measures, which would require compliance with the City's noise ordinance hourly restrictions, construction noise level increases would not result in a substantial temporary or periodic increase in ambient noise levels above levels existing without the project. With mitigation, this impact is considered ***less than significant***.

Exposure to Transportation Noise

Impact 2: *The proposed General Plan Update could result in exposure of persons to or generation of noise levels in excess of the City's noise standards. This impact would be considered* ***potentially significant.*** **[Thresholds NOI-1 & NOI-3]**

Roadway Traffic

Major noise sources in the planning area consist predominantly of vehicle traffic on area roadways. Traffic noise levels were estimated using the FHWA Highway Traffic Noise Prediction model (FHWA-RD-77-108) for existing and future cumulative (year 2035) conditions. Predicted increases in existing and future cumulative traffic noise levels, with project implementation, are summarized in Table 6 and Table 7, respectively. Predicted future cumulative traffic noise contours, with project implementation, are summarized in Tables 8. It is important to note that predicted noise contours are approximate and do not take into account shielding or reflection of noise due to intervening terrain or structures. As a result, predicted noise contours should be considered to represent bands of similar noise exposure along roadway segments, rather than absolute lines of demarcation. Although these predicted noise contours are not considered site-specific, they are useful for determining potential land use conflicts.

Table 6
Predicted Increase in Traffic Noise Levels – Existing Conditions

Roadway Segment	CNEL at 50 ft. from Near-travel-lane Centerline			Potentially Significant?[1]
	Existing Without Project	Existing With Project	Increase	
Indio Boulevard, West of Jackson Street	69.3	69.6	0.3	No
Indio Boulevard, East of Jackson Street	68.3	68.7	0.4	No
Oasis Street, North of SR-111	56.6	58.7	2.1	No
Oasis Street, South of SR-111	56.8	58.0	1.2	No
Jackson Street, North of SR-111	66.4	67.2	0.8	No
Jackson Street, South of SR-111	67.2	67.9	0.7	No
SR-111, West of Oasis Street	67.2	67.6	0.4	No
SR-111, Oasis Street to Jackson Street	67.2	67.5	0.3	No
SR-111, East of Jackson Street	64.8	65.3	0.5	No

Traffic noise levels were calculated based on traffic volumes derived from the traffic analysis prepared for this project (Kimley-Horn 2016).
1. Significant increases are based on the following thresholds (Refer to Table 1):
- *5.0, or greater, where the no-project noise level is less than 60 dBA*
- *3.0, or greater, where the no-project noise level is 60-65 dBA*
- *1.5, or greater, where the no-project noise level is greater than 65 dBA*

In comparison to existing and future cumulative conditions, implementation of the proposed project would not result in significant increases in traffic noise levels. In comparison to existing traffic noise levels, predicted increases in traffic noise levels along major roadways would be approximately 2.1 dB, or less (refer to Table 6). In comparison to predicted future traffic noise levels, the proposed project would result in increases in traffic noise levels of approximately 3.3 dB, or less (refer to Table 7). As noted in Table 8, the projected future traffic noise contours for major roadways located within the planning area, such as Indio Boulevard, Jackson Street, and SR-111, would be projected to extend beyond the roadway right-of-way. Depending on the type of land uses, distances from area roadways, and site conditions, future development could be exposed to traffic noise levels in excess of the City's

noise standards for land use compatibility. As a result, exposure to vehicular traffic noise on area roadways would be considered a ***potentially significant impact***.

Table 7
Predicted Increases in Traffic Noise Levels – Future (Year 2035)

Roadway Segment	CNEL at 50 ft. from Near-travel-lane Centerline			Potentially Significant?[1]
	Yr 2035 Without Project	Yr 2035 With Project	Increase	
Indio Boulevard, West of Jackson Street	69.9	70.2	0.3	No
Indio Boulevard, East of Jackson Street	68.8	69.1	0.3	No
Oasis Street, North of SR-111	54.1	57.4	3.3	No
Oasis Street, South of SR-111	56.4	57.7	1.3	No
Jackson Street, North of SR-111	66.5	67.2	0.7	No
Jackson Street, South of SR-111	67.3	68.0	0.7	No
SR-111, West of Oasis Street	67.6	68.0	0.4	No
SR-111, Oasis Street to Jackson Street	67.7	68.0	0.3	No
SR-111, East of Jackson Street	65.2	65.6	0.4	No

Traffic noise levels were calculated based on traffic volumes derived from the traffic analysis prepared for this project (Kimley-Horn 2016).
2. Significant increases are based on the following thresholds (Refer to Table 1):
- *5.0, or greater, where the no-project noise level is less than 60 dBA*
- *3.0, or greater, where the no-project noise level is 60-65 dBA*
- *1.5, or greater, where the no-project noise level is greater than 65 dBA*

Table 8
Traffic Noise Levels & Contour Distances
Year 2035 with Proposed Project

Roadway Segment	ADT Volumes	CNEL at 50 ft. from Near-travel-lane Centerline	Distance to CNEL Contour (Feet from Road Centerline)		
			70	65	60
Indio Boulevard, West of Jackson Street	26,192	70.2	87	254	796
Indio Boulevard, East of Jackson Street	20,230	69.1	72	202	630
Oasis Street, North of SR-111	2,714	57.4	WR	WR	WR
Oasis Street, South of SR-111	4,593	57.7	WR	WR	WR
Jackson Street, North of SR-111	15,866	67.2	WR	113	342
Jackson Street, South of SR-111	19,131	68.0	WR	134	412
SR-111, West of Oasis Street	27,437	68.0	WR	138	426
SR-111, Oasis Street to Jackson Street	28,103	68.0	WR	141	436
SR-111, East of Jackson Street	15,913	65.6	WR	84	248

Traffic noise levels were calculated based on traffic volumes derived from the traffic analysis prepared for this project (Kimley-Horn 2016).

Railroad Traffic

The UPRR main line is generally located along the northern boundary of the planning area, roughly parallel to and north of Indio Boulevard. Roughly 45 freight trains and 2 passenger trains currently travel along this rail corridor on a daily basis. By year 2035, freight trains traveling long this corridor are projected to increase to approximately 93 per day (SCAG 2013). Although future passenger trains along

this corridor would be anticipated to increase slightly in future years, overall train noise levels would be dominated by freight train traffic.

Projected future train noise levels and corresponding distance to projected noise contours are summarized in Table 9. As depicted, train noise levels are projected to reach levels of approximately 75 dBA CNEL at roughly 100 feet from the rail corridor centerline. Under future year 2035 conditions, the projected 70 CNEL contour would extend to a distance of approximately 230 feet from the centerline of the rail corridor. The projected 65 and 60 CNEL contours would exceed to approximately 500 feet and 1,075 feet, respectively, from the rail corridor centerline.

Table 9
Future Railroad Traffic Noise Levels

Trains	CNEL at 100 feet from Rail Corridor Centerline	Distance to CNEL Contours (feet) from Rail Corridor Centerline		
		70	65	60
UPRR Freight & Amtrak Passenger	75	230	500	1,075

Assumes 93 freight trains and four Amtrak passenger trains distributed equally over a 24-hour period.
Predicted noise contours do not include shielding by intervening structures.
Sources: SCAG 2013

Although the proposed project would not result in an increase in train traffic, the development of future land uses, particularly those located along the northern boundary of the planning area, could be exposed to train noise levels in excess of applicable noise standards for land use compatibility. Train noise events can also be a source of instantaneous noise, including noise generated by locomotive engines, wheel squeal, and warning horns. These instantaneous noise events can contribute to increased levels of annoyance to occupants of nearby noise-sensitive land uses. As a result, exposure to railroad traffic noise levels would be considered a ***potentially significant impact***.

Mitigation Measures

MM Noise-3. Future development projects undergoing discretionary review shall be required to analyze project-related noise impacts and incorporate necessary noise-reduction measures to ensure the compatibility of proposed land uses with applicable noise standards. Noise-reduction measures typically implemented to reduce traffic noise include increased insulation, setbacks, and construction of sound barriers.

Significance after Mitigation

Future development within the Project area would be analyzed to ensure the compatibility of proposed land uses in comparison to applicable noise standards. With implementation of the proposed mitigation measure, this impact would be considered ***less than significant***.

Exposure to Non-Transportation Noise

Impact 3: *Future development associated with the proposed Specific Plan could result in new noise-sensitive land uses encroaching upon existing or proposed stationary noise sources or new stationary noise sources encroaching upon existing or proposed noise-sensitive land uses. This could result in a substantial permanent increase in ambient noise levels in the project vicinity above existing levels or could result in exposure of persons to or generation of noise levels in excess of the City's noise ordinance standards. As a result, this impact is considered potentially significant. [Thresholds NOI-1 & NOI-3]*

Implementation of the proposed project could result in the future development of land uses that may generate noise levels in excess of applicable City noise standards. In addition, new noise-sensitive land uses could be located in areas of existing stationary noise sources. Exposure of noise-sensitive land uses to non-transportation noise levels could result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project and could result in exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance or of applicable standards of other agencies. As a result, exposure to non-transportation noise would be considered ***potentially significant impact***.

Mitigation Measures

Implement MM Noise-3.

Significance after Mitigation

Future development within the Project area would be analyzed to ensure the compatibility of proposed land uses in comparison to applicable noise standards. With implementation of the proposed mitigation measure, this impact would be considered ***less than significant***.

Exposure to Groundborne Vibration

Impact 4: *The proposed General Plan Update could result in exposure of persons to or generation of excessive groundborne vibration levels. As a result, this impact is considered potentially significant. [Threshold NOI-2]*

The effects of ground vibration can vary from no perceptible effects at the lowest levels, low rumbling sounds and detectable vibrations at moderate levels, and slight damage to nearby structures at the highest levels. At the highest levels of vibration, damage to structures is primarily architectural (e.g., loosening and cracking of plaster or stucco coatings) and rarely results in structural damage. The effects of ground vibration are influenced by the duration of the vibration and the distance from the vibration source.

There are no federal, state, or local regulatory standards for vibration. However, various criteria have been established to assist in the evaluation of vibration impacts. For instance, Caltrans has developed vibration criteria based on human perception and structural damage risks. For most structures, Caltrans considers a peak-particle velocity (ppv) threshold of 0.2 inches per second (in/sec) to be the level at which architectural damage (i.e., minor cracking of plaster walls and ceilings) to normal structures may occur. Below 0.10 in/sec there is "virtually no risk of 'architectural' damage to normal buildings." Damage to historic or ancient buildings could occur at levels of 0.08 in/sec ppv. In terms of human annoyance, continuous vibrations in excess of 0.1 in/sec ppv are identified by Caltrans as the minimum

level perceptible level for ground vibration. Short periods of ground vibration in excess of 0.2 in/sec ppv can be expected to result in increased levels of annoyance to people within buildings (Caltrans, 2002).

Groundborne vibration sources located within the project area that could potentially affect future development would be primarily associated with construction activities. With the exception of pavement breaking and pile driving, construction activities and related equipment typically generate groundborne vibration levels of less than 0.2 in/sec, which is the architectural damage risk threshold recommended by Caltrans. Based on Caltrans measurement data, use of off-road tractors, dozers, earthmovers, and haul trucks generates groundborne vibration levels of less than 0.10 in/sec, or one half of the architectural damage risk level, at 10 feet. The highest vibration level associated with a pavement breaker was 2.88 in/sec at 10 feet. During pile driving, vibration levels near the source depend mainly on the soil's penetration resistance as well as the type of pile driver used. Impact pile drivers tend to generate higher vibration levels than vibratory or drilled piles. Groundborne vibration levels of pile drivers can range from approximately 0.17 to 1.5 in/sec ppv. Caltrans indicates that the distance to the 0.2 in/sec ppv criterion for pile driving activities would occur at a distance of approximately 50 feet. However, as with construction-generated noise levels, pile driving can result in a high potential for human annoyance from vibrations, and pile-driving activities are typically considered as potentially significant if these activities are performed within 200 feet of occupied structures (Caltrans, 2002). As a result, short-term exposure to vibration levels would be considered a ***potentially significant impact***.

Proposed Mitigation Measures

Implement MM Noise-1 and MM Noise-2.

Significance after Mitigation

Due to the short-term nature of construction vibrations, the intermittent frequency of construction vibrations, and the required compliance with the City's hourly restrictions related to construction activities, construction vibration level increases will not result in exposure of persons to or generation of excessive groundborne vibration that would result in a significant increase in annoyance. Implementation of MM Noise-1 would include measures that would reduce potential impacts to nearby land uses, such as the use of alternatively powered construction equipment. MM Noise-2 would also limit demolition and construction activities to the less sensitive daytime hours. In addition, individual development projects undergoing discretionary review will be subject to site-specific environmental review, which will necessitate identification of site-specific mitigation in the event that significant impacts are identified. With mitigation, this impact is considered ***less than significant***.

Mitigation Measures

None required.

Cumulative Impacts

Cumulative Short-Term Construction Noise & Vibration Impacts

Impact 5*:* *Construction of future land uses within the proposed project area could contribute to a substantial temporary increase in ambient noise levels above levels existing without the project. However, because construction activities associated with community development projects tend to be localized and of limited duration and intensity, construction-generated noise and vibration levels are not anticipated to contribute substantially to the cumulative environment at any given location. Therefore, short-term noise impacts are considered* ***less than significant****. [Thresholds NOI-1, NOI-2 & NOI-4]*

The location of future development within the proposed project area is currently not known. Development may also occur in other areas of the City associated with redevelopment of existing developed sites as well as new construction on undeveloped sites. However, because construction activities associated with community development projects tend to be localized and of limited duration and intensity, construction-generated noise and vibration levels are not anticipated to contribute substantially to the cumulative environment at any given location. In addition, construction activities would be subject to compliance with the City's municipal code requirements and would typically be limited to between the less noise-sensitive daytime hours. For these reasons, the project's contribution to cumulative short-term noise or vibration exposure would be considered a ***less-than-significant impact***.

Mitigation Measures

None required.

Cumulative Long-Term Operational Noise Impacts

Impact 6: *Implementation of the proposed General Plan Update would contribute to a substantial permanent increase in vehicle traffic noise levels along area roadways. Therefore, long-term noise impacts associated with implementation of the proposed General Plan Update are considered* ***potentially cumulatively considerable****.* **[Thresholds NOI-1 & NOI-3]**

As previously discussed, the ambient noise environment is influenced primarily by vehicle traffic on area roadways. The cumulative noise setting is, therefore, predominantly associated with vehicle traffic generated by project-generated vehicle traffic, as well as, development in surrounding areas of the City. Future development may also result in new noise generators and noise-sensitive land uses and potentially increase land use conflicts and hazards associated with noise.

Roadway Traffic

In comparison to existing conditions, implementation of the proposed project, in combination with anticipated growth by the year 2035, would result in projected increases in traffic noise levels along some major roadway segments (refer to Table 10). Under future cumulative conditions with buildout of the proposed project and in comparison to existing conditions, the proposed project would not contribute to significant increases in traffic noise levels along major roadway segments, including Indio Boulevard, Jackson Street, Oasis Street, and SR-111. However, development of future land uses could potentially occur in close proximity to major roadways, which may exceed applicable noise standards. Therefore, noise impacts are considered potentially cumulatively considerable.

Proposed Mitigation Measures

Implement MM Noise-3.

Significance after Mitigation

With implementation of MM Noise-3, future development projects would be required to analyze project-related noise impacts and incorporate necessary noise-reduction measures sufficient to achieve the applicable noise standards. With mitigation, this impact would be considered ***less than significant*.**

Table 10
Predicted Increases in Traffic Noise Levels
Existing Conditions Compared to Future (Year 2035) Cumulative Conditions

Roadway Segment	CNEL at 50 ft. from Near-travel-lane Centerline			Potentially Significant?[1]
	Existing Without Project	Yr 2035 With Project	Increase	
Indio Boulevard, West of Jackson Street	69.3	70.2	0.9	No
Indio Boulevard, East of Jackson Street	68.3	69.1	0.8	No
Oasis Street, North of SR-111	56.6	57.4	0.8	No
Oasis Street, South of SR-111	56.8	57.7	0.9	No
Jackson Street, North of SR-111	66.4	67.2	0.8	No
Jackson Street, South of SR-111	67.2	68.0	0.8	No
SR-111, West of Oasis Street	67.2	68.0	0.8	No
SR-111, Oasis Street to Jackson Street	67.2	68.0	0.8	No
SR-111, East of Jackson Street	64.8	65.6	0.8	No

Traffic noise levels were calculated based on traffic volumes derived from the traffic analysis prepared for this project (Kimley-Horn 2016).
3. Significant increases are based on the following thresholds (Refer to Table 1):

- *5.0, or greater, where the existing noise level is less than 60 dBA*
- *3.0, or greater, where the existing noise level is 60-65 dBA*
- *1.5, or greater, where the existing noise level is greater than 65 dBA*

Non-Transportation Sources

Development of future land uses associated with implementation of the proposed General Plan Update are not anticipated to include the installation of major non-transportation sources of noise. In addition, no major non-transportation noise sources have been identified in the project area that contribute substantially to the ambient noise environment. Furthermore, non-transportation noise sources would be subject to compliance with the City's noise control ordinance, which establishes acceptable noise levels for the purpose of minimizing potential impacts to nearby land uses. For these reasons, the project's contribution to cumulative non-transportation source noise exposure would be considered to have a ***less-than-significant impact***.

Mitigation Measures

None required.

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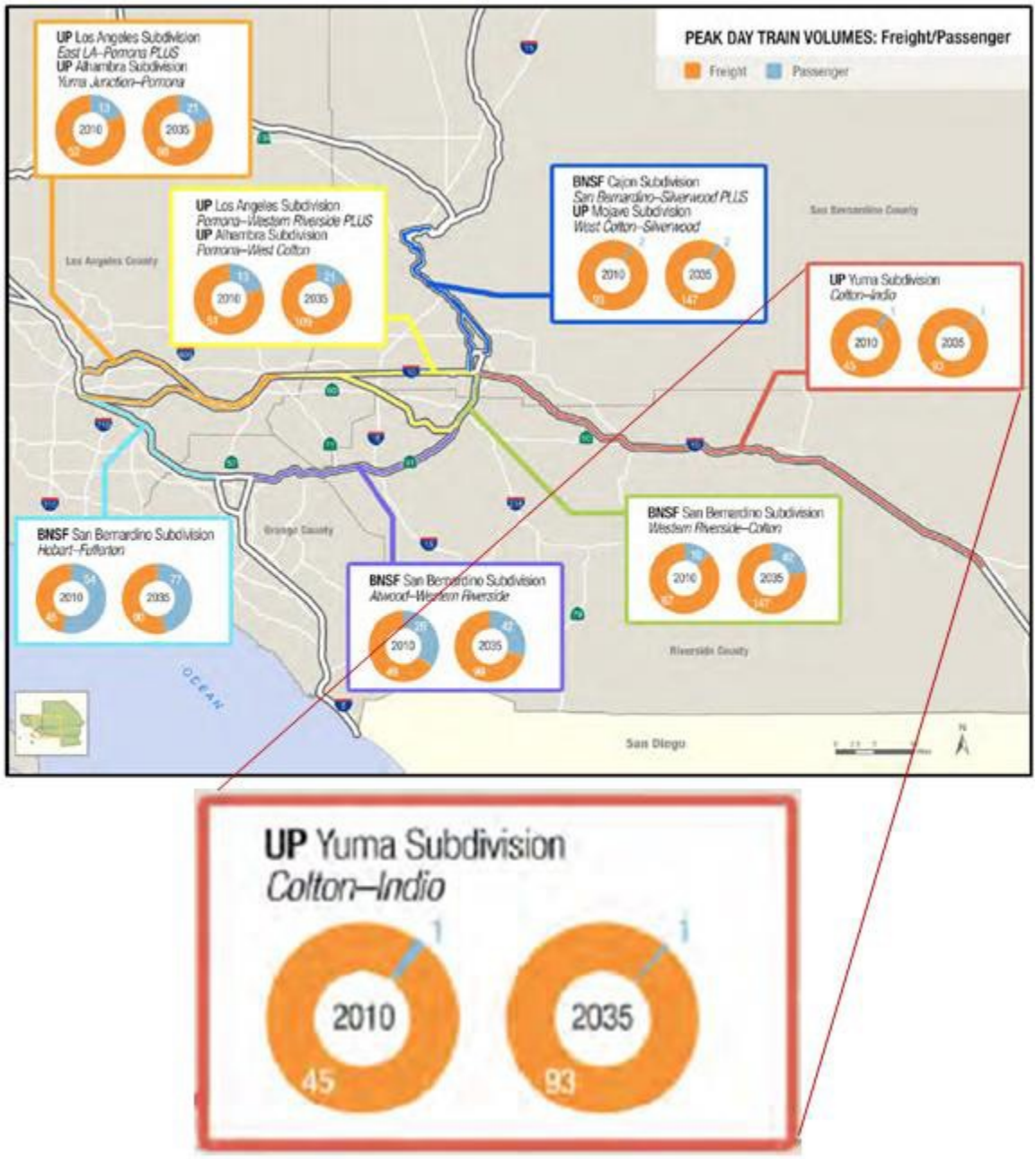
APPENDIX A
Transportation Noise Modeling

Railroad Operations

Existing and Projected Train Volumes



Source: Southern California Association of Governments (SCAG). February 2013. On the Move. Southern California Delivers the Goods. Comprehensive Regional Goods Movement Plan and Implementation Strategy. Final Report.

Project: Existing UPRR & **Amtrak**

Receiver Parameters	
Receiver:	100 Ft
Land Use Category:	2. Residential
Existing Noise (Measured or Generic Value):	30 dBA

oise SourceParameters

Number of Noise Sources: 4

Noise Source Parameters		**Source 1**
	Source Tvoe	FixedGuidewav
	Specific Source	Diesel ElectricLocomobve
Daytime hrs	Avg. Number of Locos/train	4
	Speed (mph)	50
	Avg. Number of Events/hr	1.9
Nighttime hrs	**Avg. Numberof Locos/train**	4
	Soeed tmohl	50
	Avn. Number of Events/hr	1.9
Distance	**Distance from Source to Receiver 1ft**	100
	Number of Intervening Rows of Buildings	0
Adjustments		

"'nise Source Parameters		Source 2
	Source Type	FixedGuideway
	Specific Source:	Rail Gar
Daytime hrs	**Avg. Number of Rail Cars/train**	80
	Speed (mph)	50
	Avg. Number of Events/hr	1.9
Nighttime hrs	Ava. Number of Rail Cars/train	80
	Soeed tmohl	50
	Ava. Number of Events/hr	1.9
Distance	**Distance from Source to Receiver (ft**	100
	Number of Intervening Rows of Buildings	0
Adj ustments	**Noise Barrier?**	**No**
	Jointed Track?	**No**
	Embedded Track?	**No**
	Aerial Structure?	**No**

Proiect Results Summarv

Existing Ldn	30 dBA
Total Project Ldn:	72 dBA
TotalNoise Exposure	72 dBA
Increase Imoact?	42 dB

Distance to Imoact Contours

Distto Mod.Impact Contour:	-
Dist to **Sev.**Impact Contour:	-

Source1 Results

Leq(day): 60.7 dBA
Leq(night): 60.7 dBA
L dn: 67.1 dBA

Source 2 Results

Leq(day): 63.7 dBA
Leq(night): 63.7 dBA
L dn: 70.1 dBA
Incremental Ldn !Src 1-2!: 71.9 dBA

Noise Source Parameters		Sourc e 3
	Source Tvoe	Fixed Guidewav
	Spe cific Source	Diesel Electric Locomobve
Daytime hrs	Avg. Number of Locos/train	2
	Speed	50
	Ava. Number of Events/hr	0.1
Nighttime hrs	Avg. Number of Locos/train	2
	Speed	50
	Avg. Number of Events/hr	0.1
Distance	Distance from Sou r ce to Receiver (ft)	100
	Number of Intervenina Rows of Buildinas	0
Adjustments		

So urce 3 Results

Leq(day): 44.9 dBA
Leq(night): 44.9 dBA
Ldn: 51.3 dBA
Incremental Ldn {Src 1-l l : 71.9 dBA

Noise Source Param eters		Source 4
	Source Tvoe:	Fixed Guidewav
	Spe cific Source	Rail Gar
Dayt ime hrs	Avg. Number of Rail Car s/train	5
	Speed (mph)	50
	Avg. Number of Events /hr	0.1
Nighttime hrs	Avg. Number of Rail Car s/train	5
	Speed (mph)	50
	Avg. Number of Events /hr	0.1
Distance	Distance from Sou r ce to Receiver (ft)	100
	Number of Intervening Rows of Buildings	0
Adjustments	**Noise Barrier?**	No
	Jointed Track?	No
	Embedded Track?	No
	Aerial Structure?	No

Source 4 Results

Leq(day): 38.9 dBA
Leq(night): 38.9 dBA
Ldn: 45.3 dBA
Incremental Ldn lSrc 1-41: 71.9 dBA

Project: ,Futu re UPRR & **Amtrak**

Proiect Results Summ arv

Existina Ldn:	30 dBA
Total Project Ldn:	75 dBA
Total No ise Exposure:	75 dBA
Increase :	45 dB
Imoact?	

Receiver Parameters	
Receiver:	100 Ft
Land Use Ca tegory: I	**2 . Residential**
Existina Noise {Measured or Generic Val uel:	30 dBA

Distance to Imoact Con tours

Dist to Mod. Impact Contour:	--
Dist to **Sev.** Impact Con tour:	-

Noise Source Parameters

Number of Noise Sources: 4

Noise Source Parameters		Source 1
	Source Type:	Fixed Guideway
	Specific Source:	**Diesel Electric Locomotive**
Day1ime hrs	**Ava. Number of Locos/train**	4
	Speed (mph)	50
	Avg. Number of Events/hr	3.9
Nigh ttime hr s	Ava. Number of L ocos/train	4
	Saeed {ma h)	50
	Ava. Number of Events/hr	3.9
Distance	**Distance from Source to Receiver (ft)**	100
	Number of Intervenina Rows of Buildina s	0
Adjustments		

Source 1 Results

Leq(day): 63 8 dBA
Leq(night): 63 8 dBA
Ldn: 70.2 dBA

Noise Source Parameters		Source 2
	Source Tvoe:	Fixed Guidewav
	Specific Source:	Rail Car
Day1ime hrs	**Avg. Number of Rail Cars/train**	80
	Speed (mph)	50
	Avg. Number of Events/hr	39
Nigh ttime hr s	**Avg. Number of Rail Cars/train**	80
	Soeed fm ohl	50
	Avg. Number of Events/h r	39
Distance	**Distance from Source to Receiver (ft}**	100
	Number of Intervening Ro ws of Buildings	0
Adjustments	**Noise Barrier?**	No
	Jointed Track?	No
	Embedded Trac k?	No
	Aerial Structure?	No

Source 2 Results

Leq(day): 66 8 dBA
Leq(nig h t): 66.8 dBA
Ldn: 73 2 dBA
Incremental Ld n (Src 1-2): 75 0 dBA

Nnise Source Parameters		Source 3
	Source Type:	Fixed Guideway
	Specific Source:	Diesel Electnc Locomotive
Day1ime hrs	Avg. Number of L ocos/train	2
	Speed	50
	Avg. Number of Events/hr	0.1
Nigh ttime hr s	**Ava. Number of Locos/train**	2
	Speed	50
	Avg. Numbe r of Events/hr	0 1
Distanc e	Distance from Source to Recei ver (ft)	100
	Number of Intervenina Ro ws of Buildina s	0
Adjustments		

Source 3 Results

Leq(day): 44.9 dBA
Leq(night): 44 9 dBA
Ldn: 51.3 dBA
Incremental Ldn (Src 1-31: 75 0 dBA

Noise Source Parameters		Source 4
	Source Type:	Fixed Guideway
	Specific Source:	Rail Car
Day1ime hrs	Avg. Numbe r of Rail Cars/train	5
	Speed (mp h)	50
	Avg. Number of Events/hr	0 1
Nigh ttime hr s	Ava . Numbe r of Rail Cars/train	5
	Speed (mph)	50
	Avg. Number of Events/hr	0.1
Distance	**Distance from Source to Receiver (ft)**	1 0 0
	Number of Intervenina Ro ws of Buildina s	0
Adjustments	**Noise Barrier?**	No
	Jointed Trac k?	No
	Embedded Trac k?	No
	Aerial Structure?	No

Source 4 Results

Leq(day): 38.9 dBA
Leq(n ight): 38.9 dBA
Ldn: 45 3 dBA
Incremental Ldn fSrc 1-41: 75.0 dBA

Roadway Vehicle Traffic

EXISTING CONDITIONS

ROADWAY SEGMENT	VOLUMES	SPEED	AHW	CNEL AT 50' FROM NEAR TRAVEL LANE CL	DISTANCE TO CNEL CONTOURS (FEET) 70	65	60
INDIO BLVD., WEST OF JACKSON ST	22,894	45	34	69.3	74	211	660
INDIO BLVD., EAST OF JACKSON ST	18,102	45	34	68.3	62	168	522
OASIS ST, NORTH OF STATE ROUTE 111	4,837	25	30	56.6	WR	WR	WR
OASIS ST, SOUTH OF STATE ROUTE 111	5,130	25	30	56.8	WR	WR	WR
JACKSON ST, NORTH OF STATE ROUTE 111	15,658	40	34	66.4	WR	112	338
JACKSON ST, SOUTH OF STATE ROUTE 111	18,562	40	34	67.2	WR	131	400
STATE ROUTE 111, WEST OF OASIS ST	25,018	35	30	67.2	WR	126	389
STATE ROUTE 111, OASIS ST TO JACKSON ST	25,018	35	30	67.2	WR	126	389
STATE ROUTE 111, EAST OF JACKSON ST	14,501	35	30	64.8	WR	77	227

EXISTING + PROJECT CONDITIONS

ROADWAY SEGMENT	VOLUMES	SPEED	AHW	CNEL AT 50' FROM NEAR TRAVEL LANE CL	DISTANCE TO CNEL CONTOURS (FEET) 70	65	60	CHANGE COMPARED TO NP
INDIO BLVD., WEST OF JACKSON ST	24,360	45	34	69.6	78	224	702	0.3
INDIO BLVD., EAST OF JACKSON ST	19,741	45	34	68.7	66	183	569	0.4
OASIS ST, NORTH OF STATE ROUTE 111	7,966	25	30	58.7	WR	WR	63	2.1
OASIS ST, SOUTH OF STATE ROUTE 111	6,735	25	30	58.0	WR	WR	WR	1.2
JACKSON ST, NORTH OF STATE ROUTE 111	18,709	40	34	67.2	WR	132	403	0.8
JACKSON ST, SOUTH OF STATE ROUTE 111	21,856	40	34	67.9	WR	152	471	0.7
STATE ROUTE 111, WEST OF OASIS ST	27,805	35	30	67.6	WR	140	432	0.4
STATE ROUTE 111, OASIS ST TO JACKSON ST	27,139	35	30	67.5	WR	136	422	0.3
STATE ROUTE 111, EAST OF JACKSON ST	16,107	35	30	65.3	WR	84	251	0.5

BUILDOUT YR 2035 CONDITIONS

ROADWAY SEGMENT	VOLUMES	SPEED	AHW	CNEL AT 50' FROM NEAR TRAVEL LANE CL	DISTANCE TO CNEL CONTOURS (FEET) 70	65	60
INDIO BLVD., WEST OF JACKSON ST	26,192	45	34	69.9	83	241	754
INDIO BLVD., EAST OF JACKSON ST	20,230	45	34	68.8	67	187	583
OASIS ST, NORTH OF STATE ROUTE 111	2,714	25	30	54.1	WR	WR	WR
OASIS ST, SOUTH OF STATE ROUTE 111	4,593	25	30	56.4	WR	WR	WR
JACKSON ST, NORTH OF STATE ROUTE 111	15,866	40	34	66.5	WR	113	342
JACKSON ST, SOUTH OF STATE ROUTE 111	19,131	40	34	67.3	WR	134	412
STATE ROUTE 111, WEST OF OASIS ST	27,437	35	30	67.6	WR	138	426
STATE ROUTE 111, OASIS ST TO JACKSON ST	28,103	35	30	67.7	WR	141	436
STATE ROUTE 111, EAST OF JACKSON ST	15,913	35	30	65.2	WR	84	248

BUILDOUT YR 2035 + PROJECT CONDITIONS

ROADWAY SEGMENT	VOLUMES	SPEED	AHW	CNEL AT 50' FROM NEAR TRAVEL LANE CL	DISTANCE TO CNEL CONTOURS (FEET) 70	65	60	CHANGE COMPARED TO NP
INDIO BLVD., WEST OF JACKSON ST	27,656	45	34	70.2	87	254	796	0.3
INDIO BLVD., EAST OF JACKSON ST	21,869	45	34	69.1	72	202	630	0.3
OASIS ST, NORTH OF STATE ROUTE 111	5,843	25	30	57.4	WR	WR	WR	3.3
OASIS ST, SOUTH OF STATE ROUTE 111	6,198	25	30	57.7	WR	WR	WR	1.3
JACKSON ST, NORTH OF STATE ROUTE 111	18,917	40	34	67.2	WR	133	408	0.7
JACKSON ST, SOUTH OF STATE ROUTE 111	22,425	40	34	68.0	WR	156	483	0.7
STATE ROUTE 111, WEST OF OASIS ST	30,224	35	30	68.0	WR	151	469	0.4
STATE ROUTE 111, OASIS ST TO JACKSON ST	30,224	35	30	68.0	WR	151	469	0.3
STATE ROUTE 111, EAST OF JACKSON ST	17,519	35	30	65.6	WR	91	273	0.4