Final

City of Oceanside Coast Highway Corridor Study Project

Noise and Vibration Study Technical Report

Prepared for
City of Oceanside

January 2017

ESA

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City of Oceanside Coast Highway Corridor Project

Noise and Vibration Study Technical Report

1. Introduction

This technical report addresses the potential noise and vibration impacts associated with the proposed Coast Highway Corridor Study Project (proposed project, or project). The project is composed of two major components: (1) the Complete Streets improvements, and (2) the Coast Highway Incentive District (hereinafter referred to as the Incentive District). The project is located primarily along the project segment of the Coast Highway Corridor and extends into the adjacent neighborhoods, all within the City of Oceanside, California. The project corridor consists of and is adjacent to a variety of land uses, including primarily commercial and retail along Coast Highway, with surrounding residential, primarily one block (east and west) off of the Coast Highway corridor. It should be noted that when referring specifically to each project component, the terms "Complete Streets improvements" and "Incentive District" will be used to describe the individual areas, while the term "project area" will be used when referring to the combined area of both project components.

This analysis describes the existing noise environment in the project area, identifies applicable noise regulations, and evaluates potential noise and vibration impacts associated with build-out of the Complete Streets improvements. Additionally, this technical report provides a programmatic (more general) analysis of the potential noise impacts associated with the potential future development and redevelopment that could result from the Incentive District. Where applicable, measures to mitigate or minimize noise impacts associated with the project are included.

Information used to prepare this analysis was obtained from the City of Oceanside General Plan Noise Element (City of Oceanside 2002), the project's Traffic Impact Analysis (TIA) for the Coast Highway Corridor Study prepared by IBI Group (January 2017), and other sources identified herein.

This technical report is being prepared to support the environmental review process for the project under the California Environmental Quality Act (CEQA). The City is the proponent and the lead agency for the project.

2. Project Description

This section describes the project components of the Complete Streets improvements and Incentive District. The Complete Streets improvements are specific improvements to be constructed within the existing Coast Highway corridor in the near-term. The creation of the

Incentive District would be based on the implementation of the Coast Highway Vision and Strategic Plan, amendments to the Zoning Ordinance for the Incentive District, and an amendment to the City's General Plan.

2.1 Complete Streets Improvements

The Coast Highway corridor currently operates with four travel lanes, two northbound and two southbound, with limited on-street parking and no designated bicycle facilities. The Complete Streets improvements would result in several changes to the Coast Highway corridor (**Figure 1**). The improvements would convert Coast Highway from four lanes to two lanes throughout the corridor, with segments of two southbound travel lanes between State Route 76 (SR-76) and Surfrider Way, and south of Kelly Street to Eaton Street. The improvements would also provide new traffic intersection roundabouts, new on-street parking, continuous bicycle facilities, and streetscape improvements within the corridor.

The improvements would include the phased installation of traffic roundabouts at 12 specific intersections, which are identified in the project TIA along the Coast Highway corridor and are currently either signalized or stop-sign controlled (Figure 1) (IBI 2017). The roundabouts would feature one lane in each direction with the exception of the roundabout proposed at SR-76 and Coast Highway, which would consist of two lanes in each direction. The 12 roundabouts are proposed along Coast Highway at the intersections with the following streets:

1. SR-76
2. Surfrider Way
3. Civic Center Drive
4. Pier View Way
5. Michigan Avenue
6. Washington Avenue
7. Wisconsin Avenue
8. West Street
9. Oceanside Boulevard
10. Morse Street
11. Cassidy Street
12. Kelly Street

All of these intersections are currently signalized, except for the intersections with Washington Avenue, West Street, and Kelly Street, which currently are stop-sign controlled (IBI 2017).

The improvements would also add dedicated two-way left-turn lanes within the street segments of Coast Highway between Harbor Drive and SR-76 and Pier View Way and Seagaze Drive. Dedicated middle two-way left-turn lanes would be added between SR-76 and Surfrider Way, Oceanside Boulevard and Morse Street, and Kelly Street and Vista Way. Street segments with improved raised medians without the ability to turn left would include Surfrider Way to Pier View Way, Seagaze Drive to Oceanside Boulevard, and Morse Street to Kelly Street. Additionally, the improvements would create continuous bicycle facilities throughout the Coast Highway corridor, starting at Harbor Drive and extending south past Eaton Street.

SOURCE: City of Oceanside 2016

City of Oceanside Coast Highway Corridor Study. 130217

Figure 1

Project Area and Noise Measurement Locations

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Construction of the Complete Streets improvements is anticipated to begin in January 2018 and be completed by December 2035, potentially over approximately an 18-year period. Construction of the improvements would be implemented in multiple phases, with each phase anticipated to construct a maximum of two roundabouts. The exact construction plan and scheduling of the project has not been determined. In order to develop parameters for the noise analysis the City estimated a worst-case (most impactful) analysis scenario. Under this worst-case scenario, two roundabouts would be constructed simultaneously over a 4-month period, starting between January 2018 to April 2018 (i.e., phase one). A maximum of 20 haul truck trips per day were assumed to haul demolition debris (pavement removed for roundabouts) during the respective phases. Construction of the Complete Streets improvements would occur from 7:00 a.m. to 6:00 p.m. Monday through Saturday (i.e., daytime construction only, no evening or night construction). No construction would occur on Sundays.

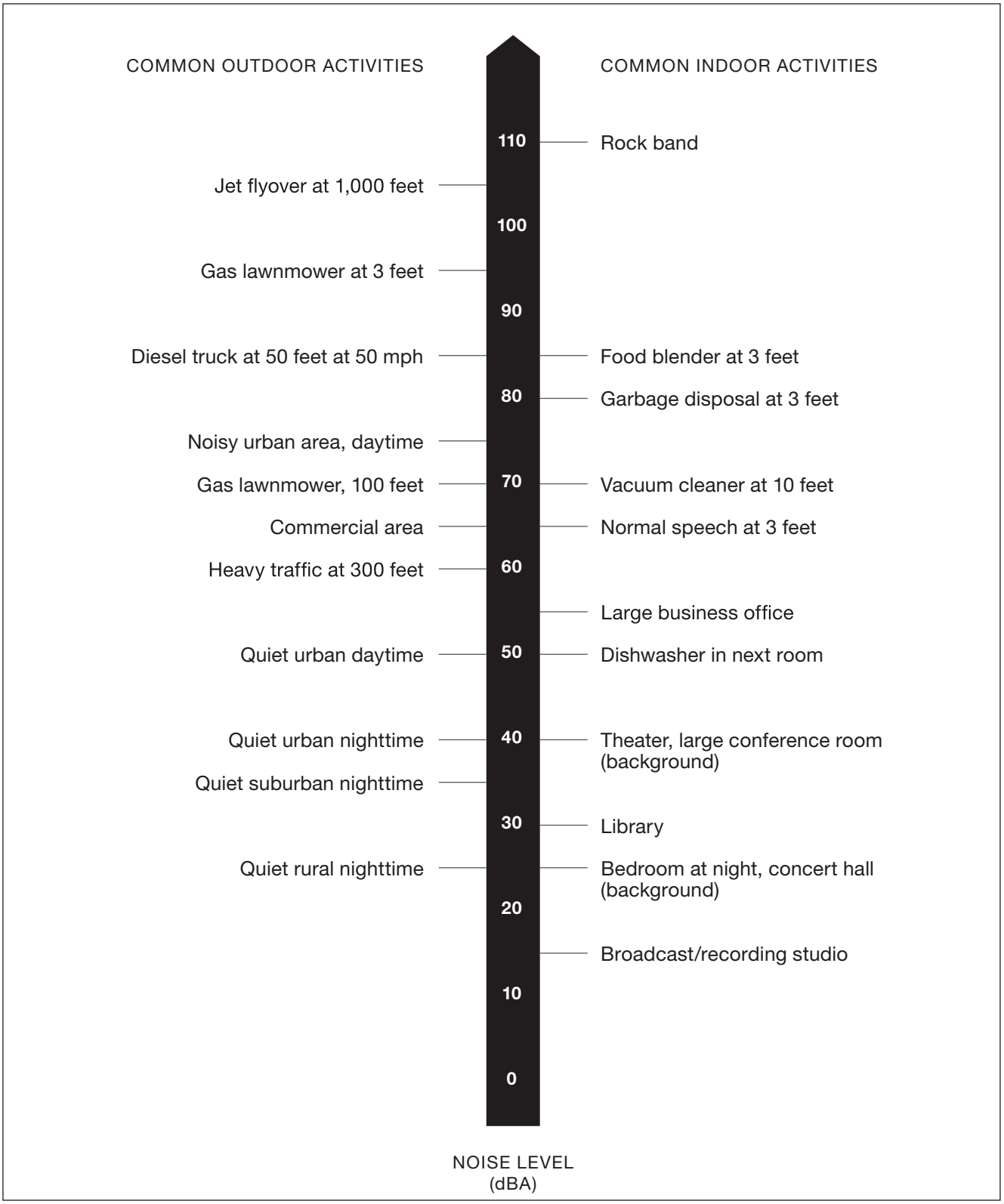
2.2 Incentive District

In addition to the Complete Streets improvements, the project would also include the Incentive District (Figure 1). The Incentive District would extend primarily along most of the Coast Highway corridor in an irregular shape from Seagaze Drive to the north, to just past Eaton Street to the south, and from as far as east as Ditmar Street, to as far west as Pacific Street (Figure 1). The Incentive District would provide optional regulations and standards which a developer or property owner may choose in lieu of the existing underlying zoning. If opted for, the Incentive District would apply to all new land uses, new or developed structures, subdivisions, and assemblages within the Incentive District area. Implementation of the Incentive District would require amendments to the City's existing General Plan and Zoning Ordinance. Since the future projects developed under the Incentive District are unknown at this time, a programmatic analysis of the Incentive District is presented within this report.

3. Environmental Setting

3.1 Noise Principles and Descriptors

The decibel (dB) is a conventional unit for measuring the amplitude of sound, as it accounts for the large variations in sound pressure amplitude, and reflects the way people perceive changes in sound. When describing sound and its effect on humans, A-weighted (dBA) sound levels are typically used to account for the response of the human ear. The term "A-weighted" refers to a filtering of the noise signal in a manner corresponding to the way the human ear perceives sound. Some representative common outdoor and indoor noise sources and their corresponding A-weighted noise levels are shown in **Figure 2**.



SOURCE: Caltrans

City of Oceanside Coast Highway Corridor Study Project

Figure 2

Decibel Scale and Common Noise Sources

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3.2 Noise Exposure and Community Noise

The following noise descriptors are used to characterize environmental noise levels over time, which are applicable to the proposed project:

L_{eq}: The equivalent sound level over a specified period of time, typically, 1 hour (i.e., $L_{eq(1)}$). The L_{eq} is also referred to as the average sound level.

CNEL: The Community Noise Equivalent Level (CNEL) is the equivalent A-weighted noise level during a 24-hour day, that includes an addition of a 5 dB penalty to noise levels between the hours of 7:00 a.m. to 10:00 p.m., and an addition of 10 dB to noise levels between the hours of 10:00 p.m. to 7:00 a.m., to account for noise sensitivity in the evening and nighttime, respectively.

3.3 Effects of Noise on People

People judge the relative magnitude of sound sensation by subjective terms such as "loudness" or "noisiness." A change in sound level of 3 dB is considered "just perceptible," a change in sound level of 5 dB is considered "clearly noticeable," and a change of 10 dB is recognized as "twice as loud."

Because decibels are logarithm values, they cannot be combined by normal algebraic addition. For example, when the decibel values of two sources differ by 0 to 1 dB, combining them would add 3 dB to the higher level for the combined sound level. When the decibel levels of two sources differ by more than 1 dB, combining them would add between 0 to 3 dBA to the higher level, depending on the relative difference. At a difference of 10 dB or more, the higher noise source dominates, and there is no addition to the higher level source (i.e., there is no effective change in the overall decibel value with or without the addition of the lower noise level source).

3.4 Noise Attenuation

When noise propagates over a distance, the noise level reduces (i.e., attenuates) with distance, the degree to which depends on the type of noise source and the propagation path. Noise from a localized source (i.e., point source) propagates uniformly outward in a spherical pattern, referred to as "spherical spreading." Stationary point sources of noise, including stationary mobile sources, such as idling vehicles, attenuate at a rate of 6 dBA for acoustically "hard" sites and 7.5 dBA for acoustically "soft" sites, for each doubling of distance from the reference measurement, as their energy is continuously spread out over a spherical surface. Hard sites are those with a reflective surface between the source and the receiver, such as asphalt or concrete surfaces or smooth bodies of water. No attenuation from the ground surface is assumed for hard sites, and the 6 dBA reduction in noise levels with doubling of distance is only from the geometric spreading of the noise from the source (e.g., for hard sites, 80 dBA at 50 feet attenuates to 74 at 100 feet, 68 dBA at 200 feet). Soft sites are those with an absorptive ground surface, such as soft dirt, grass, or scattered bushes and trees; in addition to the 6 dBA reduction from geometric spreading, soft sites provide an additional attenuation of up to 1.5 dBA per doubling distance from the surface. Typically, in an analysis, the given ground surface is somewhere in between a hard and soft site; therefore, for a conservative estimate, the hard site attenuation rate

of 6 dBA for point sources is typically used in analyses, rather than attempt to determine the exact surface conditions between each source and receptor.

Roadways and highways consist of several localized noise sources on a defined path, and hence, are treated as "line" sources, which approximate the effect of several point sources. Noise from a line source propagates over a cylindrical surface, often referred to as "cylindrical spreading." Line sources (e.g., traffic noise from vehicles) attenuate at a rate of between 3 dBA for hard sites and 4.5 dBA for soft sites for each doubling of distance from the reference measurement. Therefore, noise due to a line source attenuates less (about half) with distance than that of a point source.

3.5 Fundamentals of Vibration

Vibration is an oscillatory motion through a solid medium in which the motion's amplitude can be described in terms of displacement, velocity, or acceleration. The response of humans, buildings, and equipment to vibration is more accurately described using velocity or acceleration. Vibration amplitudes are usually described in terms of peak levels, as in peak particle velocity (PPV). The peak level represents the maximum instantaneous peak of the vibration signal. In addition, vibrations can be measured in the vertical, horizontal longitudinal, or horizontal transverse directions. Ground vibrations are most often greatest, and can damage buildings, when they propagate in the vertical direction. Therefore, the analysis of ground-borne vibration associated with the proposed project was evaluated in the vertical direction. Typically, ground-borne vibration generated by man-made activities attenuates rapidly with distance from the source of the vibration. Man-made vibration issues are, therefore, usually confined to short distances from the source (i.e., 50 feet or less).

3.6 Existing Conditions

The land uses of the project area include primarily commercial and some multi-family residential along the Coast Highway, with adjacent neighborhoods of primarily single-family residential land uses. Some land uses are considered more sensitive to noise than others due to the types of activities that typically occur at the receptor location. Noise-sensitive receptors are typically defined as land uses that are considered more sensitive to intrusive noise than others, such as residences, schools, motels and hotels, libraries, and hospitals, due to the land use activities typically occurring at the receptor (i.e., sleeping, concentrating, and convalescing).

The City's General Plan Noise Element identifies that residences, schools, churches, libraries, hospitals, convalescent homes, and similar use buildings require specific consideration in the selection of locations and construction materials to maintain acceptable noise levels (City of Oceanside 2002). Existing noise sensitive uses in proximity to the Complete Streets improvements project area (i.e., within approximately 500 feet) include residential uses, hotel/motels, a public library, seven churches, and two schools; no hospitals, nursing homes, or parks are currently located in proximity to the improvements corridor. Specifically, existing multi-family residences uses are located along the Coast Highway corridor and its cross streets with Neptune Way, Surfrider Way, Michigan Avenue, Washington Avenue, and Cassidy Street, as well as existing single- and multi-family residential uses located along the cross streets of

Michigan Avenue and Kelly Street. The Oceanside Public Library is located adjacent to the corridor. Seven churches (St Mary Star of the Sea, Grace Chapel of the Coast, First Christian, Grace Christian, St. Anne Episcopal, Second Missionary Baptist, and Church of Christ) are located in proximity to the corridor, as close as approximately 290 feet from the corridor. The St. Mary Start of the Sea School and the Santa Margarita School are located approximately 270 feet and 255 feet from the corridor, respectively. The Turning Point Crisis Center (a residential drug and alcohol rehabilitation center) is located approximately 225 feet from the corridor.

Existing noise sensitive uses in proximity to (i.e., within approximately 500 feet) of the Incentive District boundary include the uses described for the Complete Streets improvements corridor as well as additional residential uses and hotel/motels; no additional schools, libraries, churches, hospitals, nursing homes, or parks are in proximity to the Incentive District beyond those mentioned previously for the Complete Streets improvements. Specifically, the additional existing single- and multi-family residences are located within and in proximity to the entire Incentive District boundary.

All other noise-sensitive uses regulated by the City are located at greater distances from the project area (i.e., the Complete Streets improvements and Incentive District) which, due to attenuation with distance, would experience lower noise levels from potential sources of project construction noise in the project area.

Existing Ambient Daytime Noise Levels

The predominant existing noise source in the project area is roadway traffic noise from the Coast Highway corridor and its cross streets of Neptune Way, Surfrider Way, Michigan Avenue, Washington Avenue, Oceanside Boulevard, Cassidy Street, and Kelly Street. In addition, intermittent but frequent train traffic occurs on the railway mainline located parallel to the Coast Highway project corridor, approximately 800 feet to the west, with the Oceanside Station located along the rail line between Seagaze Drive and Michigan Avenue. The rail line and station are served by regional and commuter passenger rail (Amtrak and Metrolink/Coaster). Secondary noise sources include general commercial- and residential-related operational activities, such as loading dock/delivery truck activities, trash compaction, refuse service activities, and those specific to the commercial activity (e.g., tire and auto repair shops). In addition, aircraft flyovers occur randomly from commercial and military aircraft. The nearest commercial airport is the Oceanside Municipal Airport located approximately 1.8 miles east of the Coast Highway project corridor.

Ambient noise measurements were conducted at six representative locations along the Coast Highway project corridor, at the noise sensitive land uses (i.e., residences) nearest to project intersections of the corridor, to establish conservative ambient noise levels. The measurement locations along with existing development and nearby future development are shown in Figure 1. Short-term (15-minute) noise measurements were conducted at locations ST-1 through ST-6. Ambient sound measurements were conducted on Thursday, August 18, 2016, from approximately 12 p.m. to 3 p.m. to establish ambient conditions in the project area.

The ambient noise measurements were conducted using the Larson-Davis 824 Precision Integrated Sound Level Meter (SLM), which is a Type 1 standard instrument, as defined in the American National Standard Institute S1.4. All instruments were calibrated and operated according to the applicable manufacturer specification. The SLM microphone was placed at a height of 5 feet above the local grade, at the following measurement locations to represent the existing noise environment:

Measurement Location ST-1: The SLM was placed at multi-family residential uses along Neptune Way west of Coast Highway.

Measurement Location ST-2: The SLM was placed at multi-family residential uses along Surfrider Way west of Coast Highway.

Measurement Location ST-3: The SLM was placed at single- and multi-family residential uses along Michigan Avenue east of Coast Highway.

Measurement Location ST-4: The SLM was placed at single- and multi-family residential uses along Washington Avenue east of Coast Highway.

Measurement Location ST-5: The SLM was placed at multi-family residential uses along Cassidy Street west of Coast Highway.

Measurement Location ST-6: The SLM was placed at single- and multi-family residential uses along Kelly Street west of Coast Highway.

A summary of noise measurement data is provided in **Table 1**. The existing ambient daytime noise levels range from the lowest at ST-6 at 59 dBA L_{eq} to the highest at ST-2 at 74 dBA L_{eq}.

TABLE 1
SUMMARY OF AMBIENT NOISE MEASUREMENTS

Location, Duration, Existing Land Uses, and Date of Measurements	Daytime (7 A.M. to 10 P.M.) Hourly L_{eq}
ST-1 – Multi-family Residential Uses 8/18/16 (12:14 P.M. to 12:30 P.M.)/Thursday	63 dBA
ST-2 – Multi-family Residential Uses 8/18/16 (12:35 P.M. to 12:50 P.M.)/Thursday	74 dBA
ST-3 – Multi-family Residential Uses 8/18/16 (12:58 P.M. to 1:13 P.M.)/Thursday	61 dBA
ST-4 – Single- and multi-family Residential Uses 8/18/16 (1:20 P.M. to 1:35 P.M.)/Thursday	61 dBA
ST-5 – Multi-family Residential Uses 8/18/16 (2:21 P.M. to 2:34 P.M.)/Thursday	69 dBA
ST-6 – Single- and multi-family Residential Uses 8/18/16 (14:42 P.M. to 14:57 P.M.)/Thursday	59 dBA

SOURCE: ESA 2017

Existing Roadway Noise Levels

Existing roadway noise levels were calculated for 44 roadway segments located in the project area based on existing traffic volumes reported in the TIA. The roadway segments selected for analysis are considered to be those that are expected to be the most directly impacted by the project, which, for the purpose of this analysis, includes the roadways that are located near and immediately adjacent to the project area. These roadways, when compared to roadways located further away from the project area, would experience the greatest percentage of changes in traffic by the project (as distances are increased from the project area, traffic is spread out over a greater geographic area and its effects are reduced).

Calculation of the existing roadway noise levels was accomplished using the Federal Highway Administration's (FHWA's) Highway Noise Prediction Model and traffic volumes at the study intersections analyzed in the project's TIA (IBI 2017). The model calculates the average noise level at specific locations based on traffic volumes, average speeds, and site environmental conditions. The average daily noise levels (dBA CNEL) along these roadway segments are presented in **Table 2**.

TABLE 2
EXISTING ROADWAY NOISE LEVELS

Roadway Segment	Existing Land Uses Located Along Roadway Segment	dBA CNEL[a]
Coast Highway		
Between SR-76 Ramps and Surfrider Way	Commercial	68.2
Between Surfrider Way and Civic Center Drive	Residential/Commercial	66.3
Between Civic Center Drive and Pier View Way	Commercial	66.3
Between Pier View Way and Mission Way	Commercial	66.0
Between Mission Way and Seagaze Street	Commercial	66.4
Between Seagaze Street and Missouri Avenue	Residential/Commercial	66.7
Between Missouri Avenue and Washington Avenue	Commercial	66.5
Between Washington Avenue and Wisconsin Avenue	Residential/Commercial	66.5
Between Wisconsin Avenue and Oceanside Boulevard	Commercial	67.3
Between Oceanside Boulevard Morse Street	Residential/Commercial	67.4
Between Morse Street and Cassidy Street	Commercial	66.9
Between Cassidy Street and Vista Way	Lodge/Commercial	67.5
Between Vista Way and Eaton Street	Commercial	67.0
Vista Way		
Between Broadway Street and Coast Highway	Residential/Commercial	60.5
Between Coast Highway and Ditmar Street	Residential/Commercial	67.3
Cassidy Street		
Between Broadway Street and Tremont Street	Residential/Commercial	61.9
Between Tremont Street and Coast Highway	Residential/Commercial	63.0
Between Coast Highway and Freeman Street	Residential/Commercial	62.2
Between Freeman Street and Ditmar Street	Residential/Commercial	62.0

TABLE 2
EXISTING ROADWAY NOISE LEVELS

Roadway Segment	Existing Land Uses Located Along Roadway Segment	dBA CNEL[a]
Morse Street		
Between Coast Highway and Freeman Street	Commercial	60.2
Between Freeman Street and Ditmar Street	Residential/Commercial	57.3
Oceanside Boulevard		
Between Tremont Street and Coast Highway	Commercial	62.9
Between Coast Highway and Ditmar Street	School/Commercial	68.4
Wisconsin Avenue		
Between Tremont Street and Coast Highway	Commercial	63.3
Between Coast Highway and Freeman Street	Residential/Commercial	59.9
Between Freeman Street and Ditmar Street	Residential/Commercial	59.9
Washington Avenue		
West of Coast Highway	Commercial	53.3
East of Coast Highway	Residential/Commercial	53.0
Missouri Avenue		
West of Coast Highway	Commercial	55.4
East of Coast Highway	Residential/Commercial	53.2
Michigan Avenue		
West of Coast Highway	Commercial	60.2
East of Coast Highway	Residential/Commercial	57.6
Seagaze Street		
Between Tremont Street and Coast Highway	Commercial	63.9
Between Coast Highway and Freeman Street	Commercial	64.5
Between Freeman Street and Ditmar Street	Commercial	64.5
Mission Avenue		
Between Cleveland Street and Coast Highway	Commercial	63.1
Between Coast Highway and Horne Street	Commercial	64.0
Pier View Way		
West of Coast Highway	Commercial	59.8
Between Coast Highway and Horne Street	Commercial	58.8
Civic Center Drive		
West of Coast Highway	Residential/Commercial	57.8
East of Coast Highway	Residential/Commercial	59.8
Surfrider Way		
West of Coast Highway	Residential/Commercial	62.8
East of Coast Highway	Residential/Commercial	58.8

[a] Based on noise levels at 25 feet distance from the roadway and residential uses if residential uses are shown along roadways.

SOURCE: ESA 2017

Existing Ground-borne Vibration Levels

Aside from periodic construction work that may occur throughout the City, other sources of ground-borne vibration in the project area include heavy-duty vehicular travel (e.g., refuse trucks, delivery trucks) on local roadways. Truck traffic at a distance of 50 feet typically generates ground-borne vibration velocity levels of approximately 63 VdB (approximately 0.006 in/sec PPV). These levels could reach 72 VdB (approximately 0.016 in/sec PPV) where trucks pass over irregularities in the road surface.

3.7 Regulatory Setting

This section presents a discussion of the relevant regulatory setting and noise regulations, plans, and policies applicable to the proposed project.

California Department of Transportation Vibration Guidance

While there are no state or California Department of Transportation (Caltrans) vibration standards, the Caltrans *Transportation and Construction Vibration Guidance Manual* provides guidelines that can be used as screening tools for assessing the potential for adverse vibration effects related to structural damage and human perception. The manual is meant to provide practical guidance to Caltrans engineers, planners, and consultants who must address vibration issues associated with the construction, operation, and maintenance of Caltrans projects. The vibration criteria established by Caltrans for assessing structural damage and human perception are shown in **Table 3** and **Table 4**, respectively.

TABLE 3
CALTRANS VIBRATION DAMAGE POTENTIAL THRESHOLD CRITERIA

	Maximum PPV (in/sec)	
Structure and Condition	**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 2013. Transportation and Construction Vibration Guidance Manual. September.

TABLE 4
CALTRANS VIBRATION PERCEPTION POTENTIAL CRITERIA

Structure and Condition	Maximum PPV (in/sec)	
	Transient Sources	Continuous/Frequent Intermittent Sources
Barely perceptible	0.04	0.01
Distinctly perceptible	0.25	0.04
Strongly perceptible	0.9	0.10
Severe	2.0	0.4

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 2013. Transportation and Construction Vibration Guidance Manual. September.

City of Oceanside General Plan Noise Element

The City's General Plan Noise Element establishes acceptable noise levels within the City's jurisdiction (City of Oceanside 2002). The Noise Element establishes the following noise level regulations for construction related noise that pertains to the proposed project:

1. It should be unlawful for any person within any residential zone of 500 feet therefrom to operate any pile driver, power shovel, pneumatic, power hoist, or other construction equipment between 8:00 p.m. and 7:00 a.m. generating an ambient noise level of 50 dBA at any property line, unless an emergency exists.
2. It should be unlawful for any person to operate any construction equipment at a level in excess of 85 dBA at 100 feet from the source.
3. It should be unlawful for any person to engage in construction activities between 6:00 p.m. and 7:00 a.m. when such activities exceed the ambient noise level by 5 dBA. A special permit may be granted by the Director of Public Works if extenuating circumstances exist.

The City's Noise Element also outlines general noise policies as follows:

- Noise levels shall not be so loud as to cause danger to public health in all zones except manufacturing zones where noise levels may be greater.
- Noise shall be controlled at the source where possible.
- Noise shall be intercepted by barriers or dissipated by space where the source cannot be controlled.
- Noise shall be reduced from structures by the use of soundproofing where other controls fail or are impractical.
- Noise levels shall be considered in the approval of any projects or activities, public or private, which requires a permit or other approval from the City.

- Noise levels shall be considered in any changes to the Land Use and Circulation Elements of the General Plan.
- Noise levels of City vehicles, construction equipment, and garbage trucks shall be reduced to acceptable levels.

City of Oceanside Noise Ordinance

Chapter 38 of the City of Oceanside Municipal Code (Noise Ordinance) governs operational noise and contains the maximum 1-hour average sound levels for various land uses for operational noise. The Noise Ordinance sets an allowed level for single-family and medium-density residential areas to 50 dBA L_{eq} from 7:00 a.m. to 9:59 p.m., and 45 dBA L_{eq} from 10:00 p.m. to 6:59 a.m. High density residential areas are limited to 55 dBA L_{eq} from 7:00 a.m. to 9:59 p.m. and 50 dBA L_{eq} from 10:00 p.m. to 6:59 a.m. **Table 5** outlines these acceptable limits.

TABLE 5
CITY OF OCEANSIDE EXTERIOR NOISE STANDARDS

Zone	Applicable Limit (dBA)	Time Period
Residential Estate, Single-Family Residential, Medium Density Residential, Agricultural, Open Space	50	7:00 A.M. to 9:59 P.M.
	45	10:00 P.M. to 6:59 A.M.
High Density, Residential Tourist	55	7:00 A.M. to 9:59 P.M.
	50	10:00 P.M. to 6:59 A.M.
Commercial	65	7:00 A.M. to 9:59 P.M.
	60	10:00 P.M. to 6:59 A.M.
Industrial	70	7:00 A.M. to 9:59 P.M.
	65	10:00 P.M. to 6:59 A.M.
Downtown	65	7:00 A.M. to 9:59 P.M.
	55	10:00 P.M. to 6:59 A.M.

SOURCE: City of Oceanside Municipal Code Section 38.12, 2016

Construction work may be exempt from the noise level limits established in Table 5 by the City Manager upon a determination that the authorization furthers the public interest. However, Section 38.17 specifically prohibits the operation of any pneumatic or air hammer, pile driver, steam shovel, derrick, steam, or electric hoist, parking lot cleaning equipment, or other appliance, the use of which is attended by loud or unusual noise, between the hours of 10:00 p.m. and 7:00 a.m. Section 38.16 prohibits nuisance noise as recommend in the General Plan Noise Element. It is unlawful for any person to make, continue, or cause to be made or continued, within the limits of the City, any disturbing, excessive, or offensive noise which causes discomfort or annoyance to reasonable persons of normal sensitivity. However, Section 35.15 exempts construction, maintenance or other public improvement activities by government agencies or public utilities.

City of Oceanside Engineering Manual

Construction noise in the City is governed by the City Engineering Manual. Construction is normally limited to the hours of 7:00 a.m. to 6:00 p.m., Monday through Friday.

4. Impacts and Mitigation Measures

This section describes the impact analysis relating to noise and vibration impacts for the proposed project, including the significance criteria, analysis methods and applicable thresholds used to determine the impacts and any required mitigation measures, if necessary.

The significance criteria are applicable to both the Complete Streets improvements and Incentive District components of the proposed project. Impact methodology and analyses are provided separately based on the project-level approach to near-term construction of the Complete Streets improvements and the programmatic approach to potential future redevelopment under the Incentive District.

4.1 Methodology

Construction Noise

Construction noise levels of the Complete Streets improvements were estimated using the FHWA's Roadway Construction Noise Model (RCNM) and information regarding likely construction equipment provided by the City. Potential noise levels were identified for the nearest sensitive receptors located off-site based on their respective distances from the proposed Complete Streets improvements. To present a conservative impact analysis, the estimated noise levels were calculated for a scenario in which all construction equipment was assumed to be operating simultaneously and located at the construction area nearest to the affected receptors. These assumptions represent the worst-case noise scenario because construction activities would typically be spread out along the Coast Highway corridor and would be located further away from the affected receptors. The estimated noise levels at the affected receptors were then compared against the City's construction noise standards established in the City General Plan Noise Element and Municipal Code, as applicable, to determine whether exceeding standards, and against existing ambient noise levels to determine whether a substantial temporary increase would occur.

Construction activity that could occur using the Incentive District provisions has the potential to generate construction noise from potential new development and redevelopment. Specific future development projects that could use the Incentive District provisions are not known at this time. As a result, specific future project-level construction information, such as development locations, construction, schedules and import and export soil quantities, are not known at this time. However, the potential construction noise levels associated with future project-level construction were estimated based on typical construction equipment noise levels. These noise levels at distances were then compared against the City's construction noise standards established in the City General Plan Noise Element and Municipal Code to determine whether noise standards could be exceeded and whether a substantial temporary increase could occur.

A significant increase in ambient noise levels may be temporary or permanent. Construction noise is typically considered temporary and short term (i.e., its effect on the environment ceases upon conclusion of construction activities). A substantial temporary increase in ambient noise levels is defined as a direct project-related increase of 10 dBA L_{eq} or greater, based on the noise standard that a 10 dBA increase is perceived by the human ear as twice as loud (FTA 2006).

Ground-borne Vibration

Ground-borne vibration levels generated from construction activities at the Complete Streets improvements were estimated at the source using data published by the Federal Transportation Administration (FTA) in its *Transit Noise and Vibration Impact Assessment* document. The attenuation of these potential construction vibration levels were calculated at nearby vibration sensitive locations (i.e., existing structures and humans) for the potential for structural damage and human perception and annoyance based on their distance from construction activities.

As with noise, construction activity that would occur in the Incentive District has the potential to generate construction vibration from potential redevelopment as a result of potential future use of heavy-duty construction equipment in proximity to vibration sensitive receptors (i.e., structures and people). However, the locations of future development projects under the Incentive District are not known at this time. However, the potential construction vibration levels associated with future project-level construction can be estimated at the source and at distances from construction activities in proximity to sensitive receptors, based on typical vibration levels of construction equipment used for typical construction activities. The estimated construction vibration levels at distances were then compared against the vibration impact criteria shown in Table 4 to determine whether would expose structures or persons to excessive vibration levels.

Roadway Noise

Construction-related traffic noise levels of the Complete Streets improvements were calculated based on project traffic information provided in the TIA. The roadway segments selected for analysis are expected to be most directly impacted by construction-related traffic, which, for the purpose of this analysis, includes the roadways that are nearest to the Complete Streets improvements, adjacent to the identified noise-sensitive receptors. The construction noise levels of the Complete Streets improvements portion of the project were calculated using the FHWA-RD-77-108 model based on construction-related traffic volumes provided in the TIA.

The Complete Streets improvements would result in several roadway and intersection changes along the Coast Highway corridor; this is not anticipated to generate additional vehicle trips as compared to existing conditions. The Complete Streets improvements would convert Coast Highway from four lanes to two lanes throughout the project corridor, with segments of two southbound travel lanes between SR-76 and Surfrider Way, and south of Kelly Street to Eaton Street. The Complete Streets improvements would also result in replacing existing intersections with roundabout intersections and new on-street parking. Continuous bicycle facilities and streetscape improvements within the corridor would be provided. Traffic noise level changes associated with implementation of the Complete Streets improvements were calculated and

compared against applicable noise standards established in the City General Plan Noise Element and Municipal Code to determine whether these noise level changes would exceed standards, and compared against existing ambient noise levels to determine whether a substantial permanent increase would occur.

Incentive District adoption could result in additional development and redevelopment in the currently commercially designated areas of the Coast Highway corridor. The potential vehicle traffic from the development that would be anticipated under the Incentive District is included in the projected traffic data from the project TIA and is included in the traffic noise analysis contained in this report. Future roadway noise levels without the Incentive District were calculated along various arterial segments adjacent to the Coast Highway corridor as compared to calculated future baseline traffic noise levels that would occur with implementation of the Incentive District.

Stationary Noise Sources

The construction Complete Streets improvements would not include any facilities that would generate operational noise. Therefore, there would be no operational noise impacts associated with the Complete Streets improvements.

Future project-level development that could occur within the Incentive District would include stationary noise sources (e.g., HVAC); however, their actual future locations are not identified as part of the Incentive District as this information is not known at this time. For this reason, the anticipated noise effects from individual development projects under the Incentive District are analyzed at a programmatic level, considering the typical noise levels generated by stationary sources compared to local regulations and existing ambient noise levels.

4.2 Thresholds of Significance

Consistent with Appendix G of the CEQA Guidelines, the project would result in a significant impact on noise and/or ground-borne vibration if it would:

1. Expose people to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.
2. Expose people to or generation of excessive ground-borne vibration or ground-borne noise levels.
3. Result in a substantial permanent increase in ambient noise levels in the project area above levels existing without the project.
4. Result in a substantial temporary or periodic increase in ambient noise levels in the project area above levels existing without the project.
5. Expose people residing or working in the project area to excessive noise levels for a proposed project located within an airport land use plan area, or, where such a plan has not been adopted, in an area within 2 miles of a public airport or public use airport.

6. Expose people residing or working in the project area to excessive noise levels for a proposed project located in the vicinity of a private airstrip.

4.3 Project Impacts

Issue 1: Would the proposed project 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?

Complete Streets Improvements

Construction of the project would require the use of heavy equipment during the demolition, grading, and excavation activities associated with the Complete Streets improvements. During each stage of development, there would be a different mix of equipment. As such, construction activity noise levels at and near the project would fluctuate depending on the particular type, number, and duration of use of the various pieces of construction equipment.

Individual pieces of construction equipment anticipated during project construction could produce maximum noise levels of 77 dBA to 90 dBA L_{max} at a reference distance of 50 feet from the noise source, as shown in **Table 6**. These maximum noise levels would occur when equipment is operating at full power. The estimated usage factors for the equipment are also shown in Table 6, which is based on FHWA's RCNM User's Guide.

TABLE 6
CONSTRUCTION EQUIPMENT NOISE LEVELS

Construction Equipment	Estimated Usage Factor, %	Noise Level at 50 Feet (dBA, Lmax)
Backhoe	40%	80
Compactor	20%	83
Concrete Saw	20%	90
Excavator	40%	81
Forklift	10%	75
Grader	40%	85
Paver	50%	77
Paving Equipment	20%	90
Roller	20%	80
Rubber Tired Loader	50%	79
Pavement Breaker	20%	89
Trencher	50%	85

SOURCE: FHWA 2006

However, equipment used on construction sites often operate under less than full power conditions, or part power. To more accurately characterize construction-period noise levels, the

average (L_{eq}) noise levels associated with each construction stage is provided in **Table 7**. These average noise levels are based on the quantity, type, and usage factors for each type of equipment that would likely be used during each construction stage, and are typically attributable to multiple pieces of equipment operating simultaneously.

TABLE 7
CONSTRUCTION AVERAGE L_{EQ} NOISE LEVELS BY DISTANCE AND CONSTRUCTION STAGE

	Sound Level in dBA (L_{eq}) at Doubled Distance				
Construction Stage	**25 feet**	**50 feet**	**100 feet**	**200 feet**	**400 feet**
Demolition	93	87	81	75	69
Vegetation Grubbing/Clearing	87	81	75	69	63
Site Surface Grading	88	82	76	70	64
Facilities Construction	91	85	79	73	67
Paving	95	89	83	77	71
Site Restoration	88	82	76	70	64

Assumes a hard surface propagation path drop-off rate of 6 dB per doubling of distance (sound level at distance X = sound level at 50 feet - 20LOG (x/50)), which is appropriate for use in characterizing point-source (such as construction equipment) sound attenuation.

SOURCE: ESA 2016

Table 7 provides the estimated worst-case construction noise levels at potential nearby noise sensitive receptors from a particular construction area along the project Coast Highway corridor. The estimated noise levels represent a conservative scenario because construction activities are analyzed as occurring at the closest extent of the construction areas from the nearest noise sensitive receptor. However, construction activities would typically be moving throughout the construction area, on average, farther away from the nearest noise-sensitive receptors, which would result in actual lower noise levels.

As shown in Table 7, the average temporary construction-period (i.e., various construction stages) noise level would range from approximately 75 to 83 dBA L_{eq} at 100 feet, and from approximately 69 to 77 dBA L_{eq} at 200 feet from construction activities of the Complete Streets improvements These noise levels would be considered loud compared to the City's operational noise level limits (non-construction) for the zoning classification of "high density, residential tourist" of 55 dBA L_{eq} daytime. However, the construction noise would occur during the daytime, when sleeping typically does not occur, and thus these land uses are less sensitive.

Construction activities of the Complete Streets improvements would be required to comply with the City's noise standards. The City's General Plan Noise Element prohibits construction between 8 p.m. and 7 a.m. within 500 feet of a residential area generating a noise level of 50 dBA at the property line. Consistent with this policy, construction of the Complete Streets improvements would occur from 7:00 a.m. to 6:00 p.m. Monday through Saturday, and no construction would occur on Sundays. The City's Municipal Code also prohibits construction between 10 p.m. to 7 a.m. for private development projects. However, Section 35.15 of the Code exempts construction,

maintenance or other public improvement activities by government agencies or public utilities. The proposed street improvements would be construction by a government agency (i.e., the City). Regardless, the project would be constructed within the more stringent parameters that apply to private projects. Therefore, the construction of the Complete Streets improvements would adhere to the City's regulatory requirements applying to construction noise. For these reasons, construction noise generated by the Complete Streets improvements would not 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; and therefore, noise impacts would be less than significant.

Incentive District

The Incentive District could result in an increase in intensity of development and redevelopment within the commercially designated areas of the project corridor. Future development within commercial zones along project corridor would be infill development. The placement of residential infill adjacent to non-residential land uses could result in operational noise impacts on residential land uses because of the differences of the allowable maximum exterior noise levels between residential and commercial land uses. However, the timing of the construction activities of individual projects associated with the Incentive District is unknown and cannot be determined at this time. Construction of individual projects would occur as property owners decide that development is warranted based in large part on the market. Additionally, the duration of construction is dependent on individual project types.

Table 7 provides the estimated worst-case construction noise levels of construction activities at various distances from the construction activities. The estimated noise levels represent a conservative scenario because construction activities are analyzed as occurring at the closest extent of the construction areas from the nearest noise sensitive receptor; whereas, construction activities would typically be moving throughout the construction area, farther away from the nearest noise-sensitive receptors. As shown in Table 7, the average temporary construction-period (i.e., various construction stages) noise levels would range from approximately 87 to 95 dBA L_{eq} at 25 feet, and from 65 to 74 dBA L_{eq} at 200 feet from a construction area. These construction noise levels would be considered loud compared to the City's operational noise level limits (non-construction) for areas zoned residential tourist of 55 dBA L_{eq} daytime, as shown in Table 5. However, the Incentive District construction noise would be expected occur during the daytime, as required by the City, when residential noise sensitive land uses (i.e., sleeping activities), are not typically occurring.

Construction activities of the Incentive District would be required to comply with the City's noise standards. The City's General Plan Noise Element prohibits construction between 8 p.m. and 7 a.m. within 500 feet of a residential area generating a noise level of 50 dBA at the property line, and operating any construction equipment at a level in excess of 85 dBA measured at 100 feet from the source. The City's Municipal Code prohibits construction between 10 p.m. to 7 a.m. Therefore, the construction of the projects under the Incentive District would adhere to the City's regulatory requirements applying to construction noise. For these reasons, construction of the development projects that would occur through implementation of the Incentive District would

not 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. For these reasons, no conflicts with applicable noise standard would occur with construction of the individual projects under the Incentive District; noise impacts for this issue would be less than significant.

Issue 2: Would implementation of the proposed project expose people to, or generate, excessive ground-borne vibration or ground-borne noise levels?

Complete Streets Improvements

Construction of the project would have the potential to generate low levels of ground-borne vibration as the operation of heavy equipment (i.e., backhoe, excavators, grader, loader, and haul trucks, etc.) generates vibrations that propagate though the ground and diminish in intensity with distance from the source. No high-impact activities, such as pile driving or rock blasting, would be used during construction of the Complete Streets improvements. The nearest off-site receptors to the Complete Streets improvements that could be exposed to vibration levels generated from construction include single-family residential uses west of the Coast Highway corridor. Ground-borne vibrations from typical construction activities very rarely reach the levels at structures that can damage structures, but they may be perceived by humans in buildings very close (i.e., within 25 feet) to a construction activity.

The vibration levels for several types of heavy construction equipment that can generate perceptible vibration levels are identified in **Table 8**, *Vibration Source Levels for Construction Equipment*. Based on the information presented in Table 8, vibration levels could range from 0.003 to 0.089 in/sec PPV at 25 feet from the operation of the equipment.

TABLE 8
VIBRATION SOURCE LEVELS FOR CONSTRUCTION EQUIPMENT

	Approximate PPV (in/sec)				
Equipment	**25 Feet**	**50 Feet**	**60 Feet**	**75 Feet**	**100 Feet**
Large Bulldozer	0.089	0.031	0.024	0.017	0.011
Caisson Drilling	0.089	0.031	0.024	0.017	0.011
Loaded Trucks	0.076	0.027	0.020	0.015	0.010
Jackhammer	0.035	0.012	0.009	0.007	0.004
Small Bulldozer	0.003	0.001	0.0008	0.0006	0.0004

NOTE: Pile driving would not be necessary for of the Complete Streets improvements.

SOURCE: FTA 2006. Transit Noise and Vibration Impact Assessment. May.

As indicated in Table 8, the highest vibration level of 0.089 in/sec PPV at 25 feet from the operation of a large bulldozer would reduce to 0.031 in/sec PPV at 50 feet. At 100 feet, the vibration level from a large bulldozer would further reduce to 0.011 in/sec PPV.

As previously shown in Tables 3 and 4, Caltrans provides threshold criteria for potential structural damage to fragile buildings of 0.2 in/sec PPV, and human perception of strongly perceptible at 0.1 in/sec PPV. Therefore, for a noise-sensitive receptor to be exposed to the Caltrans vibration threshold of strongly perceptible to humans of 0.1 in/sec PPV, the receptor would need to be located within 25 feet of the construction activity of typical heavy construction equipment as shown in Table 8 (assuming no pile driving is required for construction). This analysis assumes that pile driving is not necessary for Complete Streets construction, as specified by the City of Oceanside.

The Complete Streets improvements would occur within existing roadway intersections and street segments, which are greater than 25 feet from inhabited buildings. Therefore, construction activity of the Complete Streets improvements would not cause significant vibration impacts for the vibration threshold of human perception. As the vibration threshold of human perception of 0.1 in/sec PPV is lower than the vibration threshold of potential structural damage of 0.2 in/sec PPV , the threshold distance (i.e., setback distance) between equipment and receptor is greater for the human perception threshold and, and therefore, is more stringent and conservative for vibration impact analysis. Therefore, the construction vibration levels for the Complete Streets improvements would be less than significant.

Sources of ground-borne vibration from the operation of the Complete Streets improvements (once constructed) would include heavy-duty vehicular travel (e.g., refuse trucks, delivery trucks) on local roadways. Because the sources of ground-borne vibration and distances from receptors would be unchanged from the existing conditions, operational vibration impacts of the improvements at the off-site receptors would be consistent with the existing vibration velocity levels and with the existing ambient vibration velocity levels. As such, operational vibration impacts of the Complete Streets improvements would be less than significant.

Incentive District

With regard to construction activities of the potential development under the Incentive District, ground-borne vibration would be generated from the operation of heavy equipment primarily during site clearing and grading activities and to a lesser degree by off-site haul-trucks traveling on surface streets. The type of structures and construction methods and equipment of each of the potential developments of the Incentive District is unknown at this time. Pile driving during foundation development and vibratory compaction during surface grading may be required. Vibratory compaction rollers generate vibration levels of 0.210 in/sec PPV at 25 feet (FTA 2006). Pile driving has the greatest potential to generate high groundborne vibration levels, ranging from 0.170 to 1.518 in/sec PPV at 25 feet (FTA 2006) depending upon pile driving method and usage. Therefore, pile driving would have the potential to exceed the Caltrans human perception vibration threshold of 0.1 in/sec PPV within 150 feet, depending on the site specific soil conditions, pile driving methods and equipment used.

Due to the densely developed area within the Incentive District boundaries and the inability to know the exact nature of future proposed projects under the Incentive District, development within the Incentive District zone could be adjacent to other properties with existing structures

(e.g., residences, commercial businesses). Therefore, construction activities of typical heavy construction equipment (e.g., as detailed in Table 8) associated with the Incentive District could result in temporary significant ground-borne vibration impacts that would exceed the threshold of human perception to sensitive receptors. Typical heavy equipment is defined as engine size of 600 horsepower or greater, such as large dozers, large excavators, and large loaders.

Depending on the location of the future development projects occurring under the provisions of the Incentive District, there may or may not be residences located in proximity to the development that would be potentially affected by the construction vibration.

The following mitigation measure would be required to avoid significant vibration impacts.

> **MM Incentive District NOI-1:** For development projects considered under the Incentive District provisions, a project-level vibration analysis would be required if the construction plans for the project would include the use of any of the following:
>
> 1. Typical heavy construction equipment within 25 feet of existing inhabited structures. Typical heavy equipment is defined as equipment with an engine size of 600 horsepower or greater and includes: large dozers, large excavators, and large loaders.
> 2. Vibratory compaction rollers for use within 80 feet of inhabited structures.
> 3. Pile drivers are proposed for use within 150 feet of inhabited structures.
>
> If none of the construction methods mentioned in the enumerated list above are proposed within the described boundaries, no further analysis would be required since the distances to sensitive receptors would create enough of a buffer to ensure impacts are less that significant.
>
> The purpose of each project-level vibration analysis would be to determine if the specific project-level construction would generate vibration levels exceeding the human perception threshold of 0.1 in/sec PPV at the receptor. Project specific details that would be required in each analysis would include, but not be limited to, actual construction equipment type, sizes, and horsepower to be used, specific locations of each activity, and actual distances from the activity to inhabited buildings. Vibration levels of actual equipment to be used shall be estimated from FTA vibration guidance documents (FTA 2006), attenuated with distance to the inhabited structures, and compared to the Caltrans vibration threshold for human perception. If applicable, the intervening ground between equipment and structures would be considered for its soil properties for additional vibration attenuation.

If the project-specific analysis determines that a project-specific significant impact could occur mitigation shall be required to reduce the impact to less than significant. Alternative construction methods and equipment that generate lower vibration levels shall be considered. Estimated construction vibration levels would be required to not to exceed the vibration threshold of human perception at inhabited buildings (0.1 in/sec PPV at the receptor). Field vibration measurement surveys of actual construction vibration would be considered, as determined to be required by the vibration specialist, as part of construction vibration compliance with the threshold.

This requirement shall be implemented for all projects under the Incentive District (Administrative Development Plan Review, Development Plan Review, and Conditional Use Permit processing requirements as specified in Section 1203 of the Coast Highway Incentive District).

Implementation of MM Incentive District NOI-1 would avoid construction ground-borne vibration impacts associated with implementation of the Incentive District.

Operational activities that would occur during the Incentive District would include typical residential and commercial-grade stationary mechanical and electrical equipment such as air handling units, condenser units, exhaust fans, and electrical emergency power generators, which would produce vibration at the source. Ground-borne vibration generated by each of the above-mentioned activities would be similar to the existing vibration generated by existing operational sources (i.e., similar to traffic vibration on adjacent roadways) in the vicinity. The potential vibration impacts from all operation activities at the closest structure locations would be less than the significance threshold for perceptibility. As such, vibration impacts associated with operation of the projects developed under the Incentive District provisions would be below the significance threshold, and operation impacts would be less than significant.

Issue 3: Would implementation of the proposed project result in a substantial permanent increase in ambient noise levels in the project area above levels existing without the proposed project?

Future (2035) Traffic Conditions

Future roadway noise levels without the project were calculated along various arterial segments adjacent to the Coast Highway corridor as compared to calculated 2035 baseline traffic noise levels that would occur with implementation of the project. The future traffic scenario with the project includes both the Complete Streets improvement and a predicted net traffic change associated with the development under the Incentive District.

According to the project's TIA (IBI 2017), the Future With Project 2035 scenario generates a lower vehicle miles traveled per capita by approximately 11 percent when compared to the baseline Future Without Project Condition. This result is expected as the project seeks to promote smart growth with strategies such as encouraging and emphasizing multimodal transportation to increase access and mobility. This would be a benefit to some roadway segments as it would reduce traffic volumes and traffic noise levels. As shown in **Table 9**, traffic noise levels were

reduced at 22 roadway segments with the implementation of the Complete Streets improvements (specifically, traffic noise levels were reduced by 5.3 dBA along Cassidy Street between Freeman Street and Ditmar Street).

TABLE 9
OFF-SITE TRAFFIC NOISE IMPACTS – FUTURE (2035) WITH PROJECT CONDITIONS

	Calculated Traffic Noise Levels at 25 Feet from Roadway CNEL (dBA)			
Roadway Segment	**Future without Project (A)**	**Future with Project (B)**	**Project Increment (B-A)**	**Exceed Threshold?**
Coast Highway				
Between SR-76 Ramps and Surfrider Way	69.0	70.2	1.2	No
Between Surfrider Way and Civic Center Drive	67.1	68.3	1.2	No
Between Civic Center Drive and Pier View Way	67.6	68.1	0.5	No
Between Pier View Way and Mission Way	67.6	68.0	0.4	No
Between Mission Way and Seagaze Street	68.0	68.3	0.3	No
Between Seagaze Street and Missouri Avenue	67.3	67.0	-0.3	No
Between Missouri Avenue and Washington Avenue	67.3	66.6	-0.7	No
Between Washington Avenue and Wisconsin Avenue	67.4	66.8	-0.6	No
Between Wisconsin Avenue and Oceanside Boulevard	68.3	67.9	-0.4	No
Between Oceanside Boulevard and Morse Street	68.0	68.5	0.5	No
Between Morse Street and Cassidy Street	67.1	68.0	0.9	No
Between Cassidy Street and Vista Way	67.7	68.6	0.9	No
Between Vista Way and Eaton Street	67.3	68.6	1.3	No
North of West Street	65.4	64.0	-1.4	No
South of West Street	65.5	63.9	-1.6	No
North of Kelly Street	63.7	66.0	2.3	No
South of Kelly Street	63.2	64.1	0.9	No
Vista Way				
Between Broadway Street and Coast Highway	61.9	62.1	0.2	No
Between Coast Highway and Ditmar Street	67.8	68.4	0.6	No
Cassidy Street				
Between Broadway Street and Tremont Street	63.1	62.1	-1.1	No
Between Tremont Street and Coast Highway	63.6	63.5	-0.1	No
Between Coast Highway and Freeman Street	62.8	62.6	-0.2	No
Between Freeman Street and Ditmar Street	63.3	58.0	-5.3	No
Morse Street				
Between Coast Highway and Freeman Street	62.4	63.3	0.9	No
Between Freeman Street and Ditmar Street	59.9	60.8	0.9	No
Oceanside Boulevard				
Between Tremont Street and Coast Highway	63.8	64.5	0.7	No
Between Coast Highway and Ditmar Street	69.1	68.7	-0.4	No
Wisconsin Avenue				
Between Tremont Street and Coast Highway	64.7	64.7	0.0	No
Between Coast Highway and Freeman Street	61.2	63.3	2.1	No
Between Freeman Street and Ditmar Street	59.3	65.3	6.0	**Yes**

TABLE 9
OFF-SITE TRAFFIC NOISE IMPACTS – FUTURE (2035) WITH PROJECT CONDITIONS

Roadway Segment	Calculated Traffic Noise Levels at 25 Feet from Roadway CNEL (dBA)			
	Future without Project (A)	Future with Project (B)	Project Increment (B-A)	Exceed Threshold?
Washington Avenue				
West of Coast Highway	55.3	59.1	3.8	No
East of Coast Highway	54.3	56.8	2.5	No
Missouri Avenue				
West of Coast Highway	56.1	54.6	-1.5	No
East of Coast Highway	55.4	58.0	2.6	No
Michigan Avenue				
West of Coast Highway	65.4	62.3	-3.1	No
East of Coast Highway	58.0	59.8	1.8	No
Seagaze Street				
Between Tremont Street and Coast Highway	66.4	66.0	-0.4	No
Between Coast Highway and Freeman Street	63.4	63.3	-0.1	No
Between Freeman Street and Ditmar Street	66.2	67.2	1.0	No
Mission Avenue				
Between Cleveland Street and Coast Highway	65.2	64.9	-0.3	No
Between Coast Highway and Horne Street	65.2	64.5	-0.7	No
Pier View Way				
West of Coast Highway	61.8	60.8	-1.0	No
Between Coast Highway and Horne Street	60.9	59.8	-1.1	No
Civic Center Drive				
West of Coast Highway	59.5	59.8	0.3	No
East of Coast Highway	61.1	60.8	-0.3	No
Surfrider Way				
West of Coast Highway	63.2	64.7	1.5	No
East of Coast Highway	60.0	60.7	0.7	No

[a] Based on noise levels at 25 feet distance from the roadway and residential uses if residential uses are shown along roadways.

SOURCE: ESA 2017

However, as summarized in Table 9, the potential increase in project-related future traffic noise levels (due primarily to redistribution of traffic volumes from lane reduction along the Coast Highway corridor) over the future traffic noise levels would increase in some locations. Of these increases, the only significant increase would be along the roadway segment of Wisconsin Avenue, between Freeman Street and Ditmar Street. In this location, increase in traffic noise compared to 2035 Future Without Project Condition is predicted to be as much as 6.0 dBA CNEL, which would be a significant increase in noise levels due to the project, as this increase in sound level would exceed the significance threshold of a 5 dBA CNEL increase. The increase in sound would be substantially lower at the remaining roadway segments analyzed, and other noise impacts along the project area roadway segments would be less than significant.

In conclusion, the project-related noise increases that would occur with implementation of the Complete Streets project and development that would be anticipated to occur under the Incentive District provisions would result in a significant impact along one roadway segment, Wisconsin Avenue between Freeman Street and Ditmar Street. Because of the configuration of existing land uses in this area, these impacts could not be avoided with implementation of the project. Specifically, existing residential uses and the Saint Mary Star of the Sea School are using the roadway segment of Wisconsin Avenue between Freeman Street and Ditmar Street for access. Thus, the addition of sound walls or other attenuation approaches are not feasible in this location. As such, noise impacts would be ***significant and unavoidable*** along this roadway segment.

Stationary Noise

The construction for the Complete Streets improvements would not include any stationary facilities that would introduce a new operational noise source. Therefore, there would be no operational noise impacts associated with the Complete Streets improvements.

Implementation of the Incentive District would include operational stationary noise sources; a particular project would generate noise and expose off-site sensitive receptors to noise sources typical of mixed-use areas such as doors slamming, air conditioning units, property maintenance equipment (e.g., landscape, parking lot sweeping) radio/stereos systems, domestic animals, etc. These noise sources contribute to the ambient noise levels experienced in all similarly-developed areas, and typically do not exceed the noise standards for the types of land uses. In addition, these noise sources are consistent with adjacent uses in the vicinity. Therefore, stationary point-source noise impacts resulting future projects developed under the Incentive District would not exceed ambient noise levels and thus would not result in a substantial increase in ambient noise levels.

Development under the Incentive District could result in new commercial and residential developments located adjacent to noise sensitive properties such as existing residential areas. Depending on how close these developments are situated to the existing residential areas, the types of mechanical equipment used at the developments, and the activities that would occur at the developments, may increase the ambient noise levels. Chapter 38 of the Oceanside Municipal Code (Noise Ordinance) governs operational noise and contains the maximum 1-hour average sound level limits for various land uses for operational noise, as shown in Table 5. For this reason, it is assumed that all mechanical equipment would be designed with appropriate noise-control devices, such as sound attenuators, acoustic louvers, or sound screens/parapet walls, to comply with noise limitation requirements provided in the City Noise Ordinance, which prevents the noise from such equipment from exceeding the sound level limits. Therefore, operation of mechanical equipment associated with the Incentive District would not exceed the City's noise thresholds, and impacts would be less than significant.

Issue 4: Would implementation of the project result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?

Complete Streets Improvements

Construction activities would increase existing ambient noise levels at noise sensitive receptors (i.e. residences) in proximity to the construction activity. As shown in Table 7, construction noise would average approximately 80 dBA L_{eq} at 100 feet from a construction activity, which would temporarily increase existing ambient noise levels of approximately 65 dBA L_{eq} at sensitive receptor locations along the project corridor, as shown in Figure 1 (i.e., an approximate 15 dBA increase). As discussed in Section 4.1 Methodology, a substantial temporary increase in ambient noise levels is defined as a direct project-related increase of 10 dBA L_{eq} or greater (FTA 2006). Therefore, these impacts would be considered significant.

To reduce construction noise impacts associated with the Complete Streets construction, the following mitigation measures shall be required.

MM Complete Streets NOI-1: The following field techniques shall be implemented by the City's construction contractor to reduce construction- related noise at nearby noise-sensitive receptors (residential uses):

a. Unless safety provisions require otherwise, the Complete Streets construction contractor shall adjust all audible back-up alarms to the lowest volume appropriate for safety purposes (i.e., still maintaining adequate signal-to-noise ratio for alarm effectiveness). The contractor shall consider signal persons, strobe lights, or alternative safety equipment and/or processes as allowed, for reducing reliance on high-amplitude sonic alarms.

b. The construction contractor shall place stationary noise sources at the construction site, such as generators and air compressors, away from affected noise-sensitive receivers (residential and school uses). Non-noise-producing mobile equipment, such as trailers, shall be located in the direct sound pathways between suspected major noise-producing sources and sensitive receptors.

c. Noise producing equipment (e.g., jackhammers and pavement breakers) shall use noise attenuating shields, shrouds, or portable barriers or enclosures, to reduce operating noise.

d. Line or cover hoppers, storage bins, and chutes shall include sound-deadening material (e.g., apply wood or rubber liners to metal bin impact surfaces).

e. To the extent practicable and available, the construction contractor shall use construction equipment manufactured or modified to reduce noise and vibration emissions, such as: electric instead of diesel-powered equipment, hydraulic tools instead of pneumatic tools, and electric saws instead of air- or gasoline-driven saws.

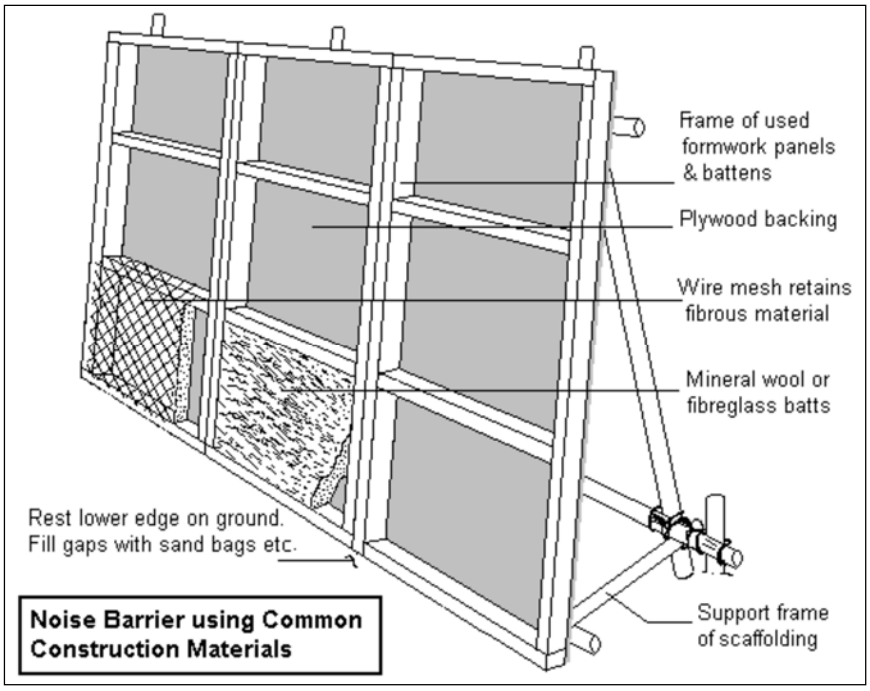
MM Complete Streets NOI-2: Where feasible, the City's contractor shall install temporary, field-erected noise barriers to block the line-of-site between construction

equipment and sensitive receptors prior to construction (in the Complete Streets project area these are limited to residential uses). Noise barriers could include sound blankets hanging on existing fences, or the use of freestanding portable sound walls. Noise barriers should be a minimum of 8-feet in height and continuous between the source of noise and adjacent or nearby noise-sensitive receptors. Noise barriers are most effective when placed directly adjacent to either the noise source or receptor.

Barrier construction may include, but not necessarily limited to, using appropriately thick wooden panel walls (at least one-half inch thick), as shown in **Figure 3**, which are tall enough to block the line-of-sight between the dominant construction noise source(s) and the noise-sensitive receptor. Such barriers can reduce construction noise by 5 to 15 dBA at nearby noise-sensitive receptor locations, depending on barrier height and length, and the distance between the barrier and the noise-producing equipment or activity. Alternatively, field-erected noise curtain assemblies could be installed around specific equipment sites or zones of anticipated mobile or stationary activity, resembling the sample shown in **Figure 4**. These techniques are most effective and practical when the construction activity noise source is stationary (e.g., auger or drill operation) and the specific source locations of noise emissions are near the ground and can be placed as close to the equipment/activity-facing side of the noise barrier as possible. Barrier layout and other implementation details would vary by construction site.

The barrier material is assumed to be solid and dense enough to demonstrate acoustical transmission loss that is at least 10 dBA greater than the estimated noise reduction effect. These suggested barrier types do not represent the only ways to achieve the indicated noise reduction in dBA; they represent examples of how such noise attenuation might be attained by an implemented measure under the right conditions.

Implementation of MM Complete Streets NOI-1 and NOI-2 would reduce construction noise impacts. With the noise reduction achieved with the noise barriers of NOI-2, the attenuated construction noise levels at a source would be reduced by 5 to 15 dBA L_{eq}, which would attenuate to a less than substantial increase in daytime ambient noise levels at an adjacent residential uses. However, mitigation measure NOI-2 (i.e., barriers) may not be feasible to implement at all locations at all times during construction activities, due to potential physical constraints at a location which allow for line-of sight between a noise source and a residence. For example, existing fences may not be tall enough or sturdy enough to support noise blankets being attached and the placement of temporary barriers could endanger construction crew members and equipment and would restrict removal of impacted materials beneath the barriers. Therefore, impacts would be potentially ***significant and unavoidable*** with regard to a temporary substantial increase in ambient noise levels.



City of Oceanside Coast Highway Corridor Study Project / 130217

Figure 3
Temporary Noise Wall Barrier Construction

City of Oceanside Coast Highway Corridor Study Project / 130217

Figure 4
Curtain-Type Noise Barrier

Incentive District

As discussed previously, construction activities could substantially increase ambient noise levels at noise sensitive receptors (i.e., existing residences and schools) in proximity to the future construction activity at the potential development within the Incentive District. As shown in Table 7, construction noise would average approximately 80 dBA L_{eq} at 100 feet from construction activities, which would temporarily increase existing ambient noise levels of approximately 65 dBA, by approximately 15 dBA L_{eq} at existing residences to be located within the Incentive District. As discussed in Section 4.1 Methodology, a substantial temporary increase in ambient noise levels is defined as a direct project-related increase of 10 dBA L_{eq} or greater (FTA 2006). Therefore, these impacts would be considered significant.

For these reasons, MM Incentive District NOI-1 and NOI-2, as applied for the Complete Streets improvements, shall be required for projects that are proposed under the Incentive District, to reduce noise generated by construction equipment in proximity to noise sensitive receptors (i.e., for the Incentive District, existing residences and schools).

> **MM Incentive District NOI-1:** For individual development projects proposed under the Incentive District, the following field techniques shall be implemented by the project construction contractor to reduce construction- related noise at noise-sensitive receptors within 100 feet of construction activity:
>
> a. Unless safety provisions require otherwise, the Incentive District construction contractor shall adjust all audible back-up alarms to the lowest volume appropriate for safety purposes (i.e., still maintaining adequate signal-to-noise ratio for alarm effectiveness). The contractor shall consider signal persons, strobe lights, or alternative safety equipment and/or processes as allowed, for reducing reliance on high-amplitude sonic alarms.
>
> b. The construction contractor shall place stationary noise sources at the construction site, such as generators and air compressors, as far away as possible from affected noise-sensitive receivers (residential and school uses). Non-noise-producing equipment, such as trailers, may be located as a sound barrier between suspected major noise-producing sources and sensitive receptors.
>
> c. Noise producing equipment (e.g., jackhammers and pavement breakers) shall use noise attenuating shields, shrouds, or portable barriers or enclosures, to reduce operating noise.
>
> d. Line or cover hoppers, storage bins, and chutes shall include sound-deadening material (e.g., apply wood or rubber liners to metal bin impact surfaces).
>
> e. To the extent practicable and available, the construction contractor shall use construction equipment manufactured or modified to reduce noise and vibration emissions, such as: electric instead of diesel-powered equipment, hydraulic tools instead of pneumatic tools, and electric saws instead of air- or gasoline-driven saws.

MM Incentive District NOI-2: Where feasible, temporary, field-erected noise barriers to block the line-of-site between construction equipment and sensitive receptors shall be installed prior to construction of the individual development projects under the Incentive District. Noise barriers could include sound blankets hanging on existing fences, or freestanding portable sound walls. Noise barriers should be a minimum of 8-feet in height and continuous between the source of noise and adjacent or nearby noise-sensitive receptors. Noise barriers are most effective when placed directly adjacent to either the noise source or receptor.

Barrier construction may include, but not necessarily limited to, using appropriately thick wooden panel walls (at least one-half inch thick), as shown in Figure 3, which are tall enough to block the line-of-sight between the dominant construction noise source(s) and the noise-sensitive receptor. Such barriers can reduce construction noise by 5 to 15 dBA at nearby noise-sensitive receptor locations, depending on barrier height and length, and the distance between the barrier and the noise-producing equipment or activity. Alternatively, field-erected noise curtain assemblies could be installed around specific equipment sites or zones of anticipated mobile or stationary activity, resembling the sample shown in Figure 4. These techniques are most effective and practical when the construction activity noise source is stationary (e.g., auger or drill operation) and the specific source locations of noise emissions are near the ground and can be placed as close to the equipment/activity-facing side of the noise barrier as possible. Barrier layout and other implementation details would vary by construction site.

Implementation of MM Incentive District NOI-1 and NOI-2 would reduce construction noise levels. With the noise reduction achieved with the noise barriers descried in MM Incentive District NOI-2, the attenuated construction noise levels at a source could be reduced by 5 to 15 dBA L_{eq}, which, in some cases, would attenuate to a less than substantial increase in daytime ambient noise levels at adjacent residential uses, and result in a less than significant impact. However, MM Incentive District NOI-2 may not be feasible to implement at all locations at all times during construction activities, due to potential physical constraints at a location which do not block line-of sight between a noise source and a residence. For example, existing fences may not be tall enough or sturdy enough to support noise blankets being attached and the placement of temporary barriers could endanger construction crew members and equipment. Therefore, impacts would be potentially ***significant and unavoidable*** with regard to a temporary substantial increase in ambient noise levels.

Issue 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, would the project expose people residing or working in the project area to excessive noise levels?

The project site is located approximately 1.8 miles west of the Oceanside Municipal Airport and is outside of the airport 60 CNEL noise contours.[1] Therefore, the project would not expose people to excessive noise levels from airport activities, and no impacts would occur due to the project.

Issue 6: For a project within the vicinity of a private airstrip, heliport or helistop, would the project expose people residing or working in the project area to excessive noise levels?

The project site is not located within the vicinity of a private airstrip, or heliport or helistop. Therefore, the project would not expose people residing or working in the project area to excessive noise levels from such uses.

4.4 Cumulative Impacts

CEQA Guidelines require a discussion of cumulative impacts of a project "when the project's incremental effect is cumulatively considerable" (2011 CEQA Guidelines, Section 15130). As defined by Section 15065 (a)(3) "cumulatively considerable" means that the incremental effects of an individual project are significant when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects (2011 CEQA Guidelines, Section 15065 (a)(3)). These cumulative impacts are defined as "two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts" (CEQA Guidelines Section 15355).

The geographic context for the analysis of cumulative impacts for noise depends on the impact being analyzed. For example, the project's contribution to localized impacts, such as those associated with project construction and project operation/traffic noise, could affect the local neighborhood and project's traffic study area. This cumulative impacts section provides a cumulative impact analysis of the entire project (Complete Streets improvements and the Incentive District), but separately for project construction and project operation given the variation of timing of these project activities.

Construction

The construction of the project includes the near-term construction of the project-level Complete Streets improvements, and the construction of potential redevelopment under the Incentive District. As previously discussed, the improvements are slated to occur in specific locations with a scheduled near-term start date and expected end date. The potential development and redevelopment under the Incentive District could occur at any qualifying parcel in the commercial area of the Incentive District at any time. Since the timing or sequencing of individual projects cannot be ascertained with any certainty any quantitative analysis to ascertain

[1] Airport Land Use Commission, San Diego County, Oceanside Municipal Airport Land Use Compatibility Plan, January 25, 2010.

the daily construction noise levels of multiple, concurrent construction would be speculative. However, the construction of the potential development under the Incentive District could start in the near-term. Therefore, it is possible that the Complete Streets project component and individual development projects implemented under the Incentive District could occur simultaneously, as well as, in proximity to each other.

The geographic scope for the consideration of cumulative project construction noise impacts are primarily the areas immediately surrounding the project site (as specified for the improvements and potentially occurring within the Incentive District boundary) and to a lesser degree, along designated haul routes where heavy construction truck traffic would travel during the project construction period. Generally, noise impacts are limited to the area directly surrounding the noise source, as noise attenuates with distance at a higher rate in proximity to the source, and only has the potential to combine with other noise sources occurring simultaneously in the immediate vicinity.

The proposed project's impacts, when viewed together with the environmental impacts from past, present, and probably future projects, could be cumulatively considerable if ambient noise increases above the increase threshold. The project construction noise (for the improvements and the Incentive District) was determined to not 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. Therefore, noise impacts would be less than significant. However, due primarily to the dense development of the project area, project construction noise would be in proximity to receptors, likely resulting in a substantial temporary increase in ambient noise. Therefore, these impacts would be considered significant.

Implementation of mitigation measures would reduce the construction noise impacts. However, mitigation measure may not be feasible to implement at all locations at all times during construction activities, due to potential physical constraints at a location which allow for line-of sight between a noise source and a residence. Therefore, impacts would be potentially ***significant and unavoidable*** with regard to a temporary substantial increase in ambient noise levels. Therefore, project construction noise would be of the magnitude to potentially combine with other cumulative projects potentially located in immediate proximity to the project site, where the noise could combine together to cumulatively substantially temporarily increase the ambient noise environment in the project area. Therefore, project construction could be a cumulatively considerable noise impact.

As previously discussed for vibration, the Complete Streets improvements would occur within existing roadway intersections and street segments, which are greater than 25 feet from structures and inhabited buildings. Therefore, the construction vibration levels would be less than the threshold (strongly perceptible to human), and the impact would be less than significant. However, construction activities associated with the Incentive District could result in temporary significant ground-borne vibration impacts that exceed the threshold of human perception to sensitive receptors located within 25 feet. Implementation of MM Incentive District NOI-1 would avoid construction ground-borne vibration impacts associated with implementation of the Incentive District. Due to the rapid attenuation characteristics of ground-borne vibration, and

distance separating construction associated with the project and any other cumulative projects, there is not a likely potential for cumulative vibration impacts. As well, implementation of MM Incentive District NOI-1 would avoid construction ground-borne vibration impacts associated with implementation of the Incentive District. Therefore, cumulative vibration impacts would be less than significant.

Operation

The operation of the project includes the operation of the project-level Complete Streets improvements and the operation of the potential redevelopment under the Incentive District. Typically, operational noise sources include stationary sources (e.g., HVAC systems of buildings) and/or mobile sources (e.g. vehicle trips).

The Complete Streets improvements would not construct any facilities with stationary noise sources (e.g., buildings) nor generate new vehicle trips; and therefore, would not introduce a new stationary or mobile operational noise sources. Therefore, there would be no operational noise impacts associated with the Complete Streets improvements. Implementation of the Incentive District would include the construction of new land uses which would include operational stationary noise sources and operational mobile sources from new vehicle trips.

The stationary operational noise sources associated with the Incentive District would generate operational noise from stationary equipment on each potential development site. Because noise attenuates with distance from its source, noise impacts from stationary sources would be limited to each of their respective sites and their vicinities. For this reason, the noise associated with stationary noise sources resulting from development under the Incentive District would not contribute to a cumulative stationary noise impact.

Vehicular traffic associated with the Incentive District would generate mobile operational noise. This analysis first considers whether noise associated with future traffic is an overall cumulative impact. As well, it is considered to what degree the project would contribute to that cumulative noise impact and if that contribution is cumulative. The overall potential cumulative impact from long-term mobile operational noise pertains to changes in roadway noise levels that could result from future traffic volumes associated with anticipated regional growth, including that under the Incentive District, along with traffic redistribution from the Complete Streets component of the project (**Table 10**). The incremental change for each street segment is compared to the significance threshold of 5 dBA CNEL. As shown in Table 10, the threshold would be exceeded for two street segments: along Wisconsin Avenue, between Freeman Street and Ditmar Street (5.4 dBA, CNEL) and along Washington Avenue, west of Coast Highway (5.8 dBA, CNEL). Therefore, future noise levels in these specific locations would be cumulatively significant.

TABLE 10
TRAFFIC NOISE IMPACTS – FUTURE (2035) CUMULATIVE INCREMENT

Roadway Segment	Calculated Traffic Noise Levels at 25 Feet from Roadway CNEL (dBA)			
	Existing (A)	Future with Project (B)	Cumulative Increment (B-A)	Exceed Threshold?
Coast Highway				
Between SR-76 Ramps and Surfrider Way	68.2	70.2	2.0	No
Between Surfrider Way and Civic Center Drive	66.3	68.3	2.0	No
Between Civic Center Drive and Pier View Way	66.3	68.1	1.8	No
Between Pier View Way and Mission Way	66.0	68.0	2.0	No
Between Mission Way and Seagaze Street	66.4	68.3	1.9	No
Between Seagaze Street and Missouri Avenue	66.7	67.0	0.3	No
Between Missouri Avenue and Washington Avenue	66.5	66.6	0.1	No
Between Washington Avenue and Wisconsin Avenue	66.5	66.8	0.3	No
Between Wisconsin Avenue and Oceanside Boulevard	67.3	67.9	0.6	No
Between Oceanside Boulevard and Morse Street	67.4	68.5	1.1	No
Between Morse Street and Cassidy Street	66.9	68.0	1.1	No
Between Cassidy Street and Vista Way	67.5	68.6	1.1	No
Between Vista Way and Eaton Street	67.0	68.6	1.6	No
Vista Way				
Between Broadway Street and Coast Highway	60.5	62.1	1.6	No
Between Coast Highway and Ditmar Street	67.3	68.4	1.1	No
Cassidy Street				
Between Broadway Street and Tremont Street	61.9	62.1	0.2	No
Between Tremont Street and Coast Highway	63.0	63.5	0.5	No
Between Coast Highway and Freeman Street	62.2	62.6	0.4	No
Between Freeman Street and Ditmar Street	62.0	58.0	-4.0	No
Morse Street				
Between Coast Highway and Freeman Street	60.2	63.3	3.1	No
Between Freeman Street and Ditmar Street	57.3	60.8	3.5	No
Oceanside Boulevard				
Between Tremont Street and Coast Highway	62.9	64.5	1.6	No
Between Coast Highway and Ditmar Street	68.4	68.7	0.3	No
Wisconsin Avenue				
Between Tremont Street and Coast Highway	63.3	64.7	1.4	No
Between Coast Highway and Freeman Street	59.9	63.3	3.4	No
Between Freeman Street and Ditmar Street	59.9	65.3	5.4	**Yes**
Washington Avenue				
West of Coast Highway	53.3	59.1	5.8	**Yes**
East of Coast Highway	53.0	56.8	3.8	No
Missouri Avenue				
West of Coast Highway	55.4	54.6	-0.8	No
East of Coast Highway	53.2	58.0	4.8	No
Michigan Avenue				
West of Coast Highway	60.2	62.3	2.1	No
East of Coast Highway	57.6	59.8	2.2	No

TABLE 10
TRAFFIC NOISE IMPACTS – FUTURE (2035) CUMULATIVE INCREMENT

Roadway Segment	Calculated Traffic Noise Levels at 25 Feet from Roadway CNEL (dBA)			
	Existing (A)	Future with Project (B)	Cumulative Increment (B-A)	Exceed Threshold?
Seagaze Street				
Between Tremont Street and Coast Highway	63.9	66.0	2.1	No
Between Coast Highway and Freeman Street	64.5	63.3	-1.2	No
Between Freeman Street and Ditmar Street	64.5	67.2	2.6	No
Mission Avenue				
Between Cleveland Street and Coast Highway	63.1	64.9	1.8	No
Between Coast Highway and Horne Street	64.0	64.5	0.5	No
Pier View Way				
West of Coast Highway	59.8	60.8	1.0	No
Between Coast Highway and Horne Street	58.8	59.8	1.0	No
Civic Center Drive				
West of Coast Highway	57.8	59.8	2.0	No
East of Coast Highway	59.8	60.8	1.0	No
Surfrider Way				
West of Coast Highway	62.8	64.7	1.9	No
East of Coast Highway	58.8	60.7	1.9	No

[a] Based on noise levels at 25 feet distance from the roadway and residential uses if residential uses are shown along roadways.

SOURCE: ESA 2017

The project's contribution to the cumulative noise impacts along these roadway segments can be determined by comparing projected future (2035) traffic noise levels without the project to the future (2035) traffic noise levels with the project (see Table 9). The project's contribution to increases in future noise levels along Wisconsin Avenue between Freeman Street and Ditmar Street is predicted to be 6.0 dBA CNEL and the project's contribution to increases in future noise levels along Washington Avenue west of Coast Highway is predicted to be 3.8 dBA CNEL. In both locations, the project's contribution would be perceptible (greater than 3 dBA). Therefore, the project contributes considerably to the significant cumulative impacts for the future (2035) traffic noise conditions along these two street segments. This is considered a significant impact of the project.

Sound walls are often used to address roadway noise impacts. However, due to the need for access points (for example, driveways to residences and street access to the Saint Mary Star of the Sea School), a wall could not be continuous and would not effectively shield the noise-sensitive uses from the roadway noise. In addition, the addition of sound walls would not be desirable as they would detract from the community character and visual quality of these neighborhoods. For these reasons, the addition of continuous sound walls to address these identified impacts would not be desirable or feasible. No other effective mitigation approaches are available. For these

reasons, the project's contribution to cumulative noise impacts along Wisconsin Avenue (between Freeman Street and Ditmar Street) and Washington Avenue (west of Coast Highway) is considered cumulatively considerable and ***significant and unavoidable***.

As previously discussed for project operation vibration, operational vibration impacts of the Complete Streets improvements at the off-site receptors would be consistent with the existing ambient vibration velocity levels. As such, operational vibration impacts of the Complete Streets improvements would be less than significant. Ground-borne vibration generated by the Incentive District development would be similar to the existing vibration generated by existing operational sources (i.e., similar to traffic vibration on adjacent roadways) in the vicinity. The potential vibration impacts from all operation activities at the closest structure locations would be less than the significance threshold of human perception. As such, vibration impacts associated with operation of the projects developed under the Incentive District provisions would be below the significance threshold, and operation impacts would be less than significant. Due to the rapid attenuation characteristics of ground-borne vibration, vibration levels similar to ambient levels, and distance separating development associated with the project and any other cumulative projects, there is no potential for cumulative vibration impacts. Therefore, cumulative vibration impacts would be less than significant.

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