4.5 NOISE

Redevelopment would result in one potentially significant and one less than significant impact regarding noise. With implementation of measures recommended in this section, the potentially significant impact would be reduced to a level that is less than significant.

Discussion of Acoustical Terms

A discussion of sound properties and terms is informative to any discussion of sound and noise. Sound levels are measured on a logarithmic scale in decibels (dB). The common measure for environmental sound is the "A"-weighted sound level (dBA). "A" scale weighting is an adjustment to measured sound that takes into account the way the human ear responds to sound. "Noise" is typically defined as unwanted sound.

The ambient noise level comprises the sum of all noise sources, both near and far. It includes indistinguishable noise from roads, machinery, aircraft, and other sources. The ambient level varies slowly with time, as these sources increase or diminish.

Because noise by its nature varies with time, it is beneficial to define certain measurement terms, also called "metrics descriptors," used to characterize this fluctuation. The energy average level over a specific period is defined as the equivalent sound level, or equivalent energy noise level, abbreviated as L_{eq}. For a given time interval, L_{eq} is a constant sound level whose acoustic energy is the same as the acoustic energy of the (actual) time-varying sound level. Thus, L_{eq} provides a measure of the true energy-average sound level in an area, and includes the sound from all constant, sporadic, or transient events. L_{eq} is usually measured in hourly intervals over long periods in order to develop 24-hour average noise levels. L_{eq} is generally used to describe levels of noise affecting sensitive receptors where the noise source itself is not of special concern during evening and nighttime hours, or where the noise is only generated during daytime hours such as with construction activities.

Other descriptors of noise are commonly used to predict noise/land use compatibility, as well as community reaction to daytime and nighttime environmental noise. These descriptors include the Day-Night Average Sound Level (abbreviated L_{dn} or DNL), and California's Community Noise Equivalent Level (CNEL). Each of these descriptors uses units of dBA. Both L_{dn} and CNEL represent 24-hour periods, and both apply a penalty to noise events that occur during evening and/or nighttime hours, when relaxation and sleep disturbance is usually of more concern. In the case of CNEL, noise occurring during the daytime hours, between 7:00 a.m. and 7:00 p.m., receives no penalty. Noise occurring between 7:00 p.m. and 10:00 p.m. (denoted "evening") is penalized by adding 5 dB to the measured noise level, while noise occurring from 10:00 p.m. to 7:00 a.m. (nighttime) is penalized by adding 10 dB to the measured level. L_{dn} differs from CNEL by not adding a penalty in the evening period. Both CNEL and L_{dn} are the predominant metrics used by local governments to describe noise environments within their jurisdictions and for land use compatibility planning purposes. The U.S. Environmental Protection Agency (EPA) recommends their use.

Other metrics presented in this report include Maximum A-weighted Sound Level ($L_{A_{max}}$) and statistical sound levels such as L_{10}, L_{50} and L_{90}. $L_{A_{max}}$ is the A-weighted maximum instantaneous sound level measured during the specified time interval or for an individual noise event. The statistical sound level quantity, L_x (in dBA), also can represent the background sound level. L_x is the level that is exceeded "x" percent of the time during a given interval.

Two relevant characteristics of sound (or noise) behavior outdoors are propagation and attenuation. Propagation refers to the manner in which sound energy travels outward from its source. The pattern of propagation is related to the geometry of the sound source. One common environmental noise source is described as a "point source." Examples of point sources are a single piece of construction equipment relatively close to a receptor or an entire construction site that is relatively far away from a receptor. The noise from such a source propagates (travels) outward in an ever-increasing spherical pattern. As the sound energy propagates and the sphere becomes larger and larger, the sound energy at any given point on the surface of the sphere becomes less and less. This reduction in noise level is described as geometric or distance attenuation and is quantified in decibel units. The rate at which the sound from a point source attenuates with distance is 6 decibels for every doubling of distance away from the source, starting at 50 feet. A second common noise source geometry is a "line source," such as a very busy highway with vehicles close together, or a long train. Sound propagates away from this type of source in the shape of a cylinder parallel to the source. As noise travels away from a line source it also attenuates, but less rapidly than the noise from a point source. The rate of attenuation from a line source is 3 decibels for every doubling of distance from the source. A quasi–line source (*e.g.*, automobiles spaced apart on a road) is between a point source and a line source; noise from a quasi–line source attenuates at the approximate rate of 4½ decibels for every doubling of distance from the source.

Factors other than distance cause additional sound attenuation. These include intervening terrain or barriers between the source and the receptor that block the direct line-of-sight, for distances greater than 1,000 feet, the atmosphere attenuates sound.

Human response to noise varies from individual to individual and is dependent upon the ambient environment in which the noise is perceived. The same noise that would be highly intrusive to a sleeping person or someone in a quiet park might be barely perceptible at an athletic event or in the middle of the freeway at rush hour. Therefore, planning for an acceptable noise exposure must take into account the types of activities and corresponding noise sensitivity in a specified location for each particular set of land uses. Some general guidelines for noise levels are: sleep disturbance may occur at an interior level above 35 dBA, interference with human speech begins at around 52 dBA, and hearing damage will result from prolonged exposure to noise levels in excess of 90 dBA. The state and City noise regulations and guidelines cited in this EIR as bases for standards of significance of noise impacts take into account the human response to noise and the noise sensitivity of various activities.

4.5.1 Study Area

The study area consists of the redevelopment project area and adjacent areas that may be affected by noise from redevelopment. An area of noise-sensitive receptors starts at Goss Street, and extends northward toward West Grand Avenue. This noise-sensitive area is bounded on the east by Mandela Parkway, and on the west by the eastern boundary of the 16th/Wood sub-district.

The study area also includes a small area north of the Howard Terminal that has noise-sensitive receptors located near truck routes in the vicinity of 3rd Street and Martin Luther King Jr. Way. This area is predominantly industrial.

4.5.2 Regulatory Setting

Federal

The Noise Control Act of 1972. The Noise Control Act (42 USC Chapter 4901 *et seq.*) directs the EPA to develop noise level guidelines that would protect the population from the adverse effects of environmental noise. The EPA published a guideline (EPA Levels Document, Report No. 556/9-74-664) containing recommendations for noise levels affecting residential land use not to exceed 55 dBA L_{dn} outdoors and not to exceed 45 dBA L_{dn} for indoors. The agency is careful to stress that these recommendations contain a factor of safety, and do not consider technical or economic feasibility issues, and therefore should not be construed as standards or regulations.

Noise Emission Standards for Transportation Equipment. Federal regulations establish noise limits for medium and heavy trucks (more than 4.5 tons, gross vehicle weight rating) under 40 CFR, Part 205, Subpart B. The federal truck passby noise standard is 80 A-weighted decibels (dBA) at 15 meters (approximately 50 feet) from the vehicle pathway centerline (Crocker 1997). Vehicle noise limits are implemented through regulatory controls on vehicle manufacturers.

The federal regulations for railroad noise are contained in 40 CFR, Part 201, and 49 CFR, Part 210. Noise limits for locomotives manufactured during or after 1980 are as follows: stationary (idle throttle setting)—70 dBA at 15 meters from the track pathway centerline; stationary (all other throttle settings)—87 dBA at 15 meters; and moving—90 dBA at 15 meters (Crocker 1997). These noise limits are implemented through regulatory controls on vehicle manufacturers.

Department of Housing and Urban Development Standards. Department of Housing and Urban Development (HUD) standards define L_{dn} below 65 dBA as acceptable for residential use. Levels up to 75 dBA L_{dn} can be made acceptable through the use of insulation in buildings (HUD 1985).

State/Regional

Noise Insulation Standards. Relevant state regulations are contained in the California Code of Regulations (CCR). Part 2 of Title 24 establishes the limit for interior community noise level for multi-family dwellings, hotels, motels, dormitories and long-term care facilities of 45 dBA L_{dn}. The state's regulation may be extended by local legislative action to include single-family dwellings.

California Governor's Office of Planning and Research Guidelines. Section 65302(f) of the CCR establishes the requirement that local land use planning jurisdictions prepare a General Plan. In 1998, the Office of Planning and Research published the most recent edition of its *General Plan Guidelines* (GPG). The GPG advises local jurisdictions in preparing their comprehensive long-term general plans. The Noise Element is a mandatory component of the General Plan and includes general community noise guidelines and specific planning guidelines for noise/land use compatibility developed by the local jurisdiction.

The GPG guidelines are presented in Figure 4.5-1. Selected relevant levels are:

- CNEL below 60 dBA—acceptable[1] for low-density residential use.
- CNEL below 65 dBA—normally acceptable for high-density residential use.
- CNEL of 60 to 70 dBA—conditionally acceptable for churches, and educational and medical facilities.
- CNEL below 70 dBA—normally acceptable for playgrounds and neighborhood parks.

Other. The State of California also establishes noise limits for vehicles licensed to operate on public roads. For heavy trucks, the state passby noise standard is consistent with the federal limit of 80 dBA. The state passby noise standard for light trucks and passenger cars (less than 4.5 tons, gross vehicle weight rating) is also 80 dBA at 15 meters from the centerline (California Vehicle Code §§ 23130 and 23130.5; §27150 *et seq.*; §§ 27204 and 27206). Vehicle noise limits are implemented through regulatory controls on vehicle manufacturers and by legal sanction of vehicle operators enforced by state and local peace officers.

The Alameda County *Airport Land Use Policy Plan* (ALUPP), adopted in 1986, contains policies intended to provide guidance in determining whether proposed actions are compatible with current and anticipated airport operations. One important concern regarding proposed actions is exposure of persons on the ground to excessive noise from air operations. The ALUPP identifies areas of concern regarding noise from air operations and land use compatibility as noise impact zones. In general, noise impact zones reflect areas where the CNEL is greater than 65 decibels or exceeds state standards due to air operations. The redevelopment project

[1] See the figure for definition of "acceptable."

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Figure 4.5-1 Guidelines for Noise-Compatible Land Use

area is not located within a noise impact zone for the Oakland Airport, taking into account airport expansion as proposed in the *Airport Development Program, Metropolitan Oakland International Airport EIR* (Port of Oakland 1997). The redevelopment project area is not considered noise sensitive relative to air operations.

Local

Regulatory noise standards generally fall into two categories: noise/land use compatibility guidelines, and noise control ordinances.

Because local jurisdictions are preempted from regulating noise emissions from transportation noise sources such as cars, trucks, trains, and airplanes, the City implements noise controls through noise/land use compatibility guidelines referenced in the General Plan and the Noise Ordinance. Noise/land use compatibility guidelines identify the range of noise levels with which various land uses are deemed compatible. This permits local jurisdictions to achieve noise/land use compatibility for the land uses exposed to noise, even if the noise sources themselves cannot be regulated. In 1974, the City of Oakland published the Noise Element of the General Plan. The Noise Element does not set forth specific guidelines for noise and land use planning. HUD guidelines, described above, are incorporated into the Noise Element.

The City also passed a noise ordinance (Oakland Municipal Code [OMC], Title 17, Chapter 17.120.050). Tables 4.5-1 and 4.5-2 identify exterior noise standards according to the City's Noise Ordinance for operational and construction noise, respectively. Table 4.5-2 applies to construction noise except if an acoustical analysis is performed and all feasible mitigation measures imposed, including standard noise measures adopted by the City Council in January 2001. Furthermore, construction or demolition noise received by any land use during the hours of 7 p.m. to 7 a.m. on weekdays and 8 p.m. to 9 a.m. on weekends, and federal holidays, shall not exceed the applicable nighttime operational noise level standard in Table 4.5-1. The City's noise ordinance also contains nuisance laws regarding persistent construction-related noise (Oakland Planning Code, § 8.18.020).

4.5.3 Regional Setting

The OARB is located west of I-880 in West Oakland. Freeways in the vicinity include I-880, I-80, I-580, and I-980. Active Bay Area Rapid Transit (BART) rail lines pass through the area. The primary sources of noise on the OARB area are freight trains operating in the Port of Oakland area and trucks serving the Port. Rail operations include the Port's Joint Intermodal Terminal (JIT), and Union Pacific's West Oakland and Desert rail yards. In addition, aircraft operating to/from Oakland International and San Francisco International airports affect ambient noise.

Table 4.5-1
City of Oakland Operational Noise Standards at Receiving Property Line, dBA[a]

Receiving Land Use	Cumulative Number of Minutes in a 1-Hour Period[b]	Maximum Allowable Noise Level (dBA)	
		Daytime 7 a.m.-10 p.m.	Nighttime 10 p.m.-7 a.m.
Residential and Civic[c]	20 (L_{33})	60	45
	10 ($L_{16.7}$)	65	50
	5 ($L_{8.3}$)	70	55
	1 ($L_{1.7}$)	75	60
	0 (L_{max})	80	65
		Anytime	
Commercial	20 (L_{33})	65	
	10 ($L_{16.7}$)	70	
	5 ($L_{8.3}$)	75	
	1 ($L_{1.7}$)	80	
	0 (L_{max})	85	
Manufacturing, Mining, and Quarrying	20 (L_{33})	70	
	10 ($L_{16.7}$)	75	
	5 ($L_{8.3}$)	80	
	1 ($L_{1.7}$)	85	
	0 (L_{max})	90	

Source: Oakland Planning Code, Section 17.120.050.

Notes:

[a] These standards are reduced 5 dBA for simple tone noise, noise consisting primarily of speech or music, or recurring impact noise. If the ambient level exceeds these standards, the standard shall be adjusted to equal the ambient noise level.

[b] L_x is the noise level exceeded x percent of a given period. L_{max} is the maximum instantaneous noise level.

[c] Legal residences, schools, childcare facilities, health care facilities, public open space, or similarly sensitive land uses.

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Table 4.5-2
City of Oakland Construction Noise Standards at Receiving Property Line, dBA[a]

Receiving Land Use	Maximum Allowable Noise Level (dBA)	
	Weekdays 7 a.m.–7 p.m.	Weekends 9 a.m.–8 p.m.
Less than 10 days		
Residential	80	65
Commercial, Industrial	85	70
More than 10 Days		
Residential	65	55
Commercial, Industrial	70	60

Source: Oakland Planning Code, Section 17.120.050.

Note: [a] If the ambient noise level exceeds these standards, the standard shall be adjusted to equal the ambient noise level.

4.5.4 Local Setting

This section describes the current setting for ambient noise, identifies noise-sensitive receptors, and describes the alternative noise baseline for year 1995 for the OARB.

Setting

Ambient Noise. To accurately describe the existing noise environment and assess potential project noise impacts on the adjacent community, an ambient noise survey was conducted in the local area Tuesday, April 17, 2001 through Wednesday, April 18, 2001. Noise levels were found to be typical for an urban area that includes major transportation facilities.

The most significant consistent noise source in the area of West Oakland is from vehicle traffic on I-880. Noise from BART operations is a major contributor to the noise environment, depending on proximity to the line. BART operations are audible at the intersection of 14th and Wood streets, and are possibly audible farther away. Commercial aircraft are also a considerable noise source in the area. Activities at nearby railyards are occasionally acoustically perceptible, but are not the primary noise source. The railyard facilities do not constitute a major noise source because of substantial distance, intervening structures, and existing ambient noise levels. There are also minor noise sources from industrial facilities in the area, mostly involving heavy trucks and forklifts.

Figure 4.5-2 depicts the short- and long-term sound measurement locations representing the previously mentioned residential and recreational noise-sensitive receptors within the study area. Eleven locations were surveyed immediately east of the 16th/Wood sub-district, two locations were surveyed immediately north of the Howard Terminal and the Inner Harbor, and one location was surveyed adjacent to Burma Road on the northern boundary of the OARB sub-district. Two of the locations were used for unattended long-term monitoring of approximately 25 hours duration. The remaining 11 locations were used for 12 attended short-term monitoring periods of approximately 15 minutes each.

The long-term measurements were made with Type 2, Metrosonics db308 community noise analyzers. The short-term measurements were made with a tripod-mounted Type 1 Brüel & Kjær Type 2231 Sound Level Meter (SLM) with statistical analyzer. To ensure accuracy, laboratory calibration of the instruments was field checked before and after each measurement period using an acoustical calibrator. The accuracy of the acoustical calibrator is maintained through a program established by the manufacturer, and is traceable to the National Institute of Standards and Technology. The sound measurement instruments meet the requirements of the American National Standard S 1.4-1983 and the International Electrotechnical Commission Publications 804 and 651. In all cases, the instruments were set on “slow” time response using the A-weighted decibel (dBA) scale. The microphones were equipped with standard windscreens and set at a height of 5 feet above the ground.

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Figure 4.5-2 Noise Monitoring Sites

Weather conditions during the survey period were mild, with clear or partly cloudy skies. Air temperatures varied from 67 °F to 75 °F, with 35 to 40 percent relative humidity. Wind speed varied from 0 to 7 miles per hour (mph) for most of the survey period, increasing at midday on April 18 to speeds of 8 to 12 mph with gusts to 17 mph. The wind direction was generally from the west. Apart from increased wind speeds for the last few measurements, weather conditions were acoustically ideal and did not adversely affect the measurement accuracy.

The ambient survey included two long-term survey sites. The first was designated Long-Term 1 (LT-1), and the second Long-Term 2 (LT-2). Both monitors recorded noise data for approximately 25 continuous hours. Relevant data are provided in Appendix 4.5.

LT-1 was located on a post in the parking lot of the Women's Economic Agenda Project (WEAP), located at Pine and Goss streets. Noise from I-880 and local traffic, BART, and aircraft dominated the noise environment at LT-1. Hourly daytime and evening noise levels varied from 62 dBA L_{eq} to 67 dBA L_{eq}; nighttime hourly noise levels varied from 54 dBA L_{eq} to 64 dBA L_{eq}.

The CNEL value for LT-1 was 68 dBA, which is Conditionally Acceptable for all residential categories and Normally Acceptable for schools, libraries, churches, hospitals, nursing homes, playgrounds, and neighborhood parks with respect to the OPR recommendations.

LT-2 was located in the front garden of 1109 Wood Street (between 11th and 12th streets). The noise environment at LT-2 was dominated by traffic on adjacent streets, which included buses and an occasional heavy truck, and was also affected by aircraft overflights. Traffic on I-880 contributed to residual ambient noise. Daytime and evening hourly noise levels varied from 57 dBA L_{eq} to 68 dBA L_{eq}, nighttime hourly noise levels varied from 49 dBA L_{eq} to 57 dBA L_{eq}.

The CNEL value for LT-2 was 64 dBA. According to OPR standards, this is Conditionally Acceptable for residential low-density single-family, duplex, and mobile homes. The CNEL at LT-2 is Normally Acceptable for multi-family residential, motels, hotels, schools, libraries, churches, hospitals, nursing homes, playgrounds, and neighborhood parks according to OPR standards.

A summary of short-term noise measurements is provided in Appendix 4.5. Short-term noise measurements were conducted at 12 sites concurrent with the long-term sites. The short-term locations in the community were selected to represent the nearest noise-sensitive receptors to the east boundary of the redevelopment and the associated truck routes in the area. Measured ambient noise levels (L_{eq}) varied from 56 dBA L_{eq} at a residence on 17th Street to 71 dBA L_{eq} at a residence on Martin Luther King Jr. Way near 4th Street. The majority of the measurements made in the area along Wood Street resulted in L_{eq} levels between 61 dBA and 63 dBA. This is considered a reasonable range for daytime noise levels in a residential area that is close to a major freeway. The measured daytime noise levels in area east of the 16th/Wood sub-district are consistent with similar to the long-term CNELs discussed above. The daytime measured noise levels in the area of 3rd Street were 67 dBA L_{eq} and 71 dBA L_{eq}. Employing the OPR guidelines,

these daytime levels would lead to CNEL values in the Normally Unacceptable range for residential categories (70 to 75 dBA CNEL).

Noise Sensitive Receptors. The area southeast of the 16th/Wood sub-district is of generally residential use at the southern end, transitioning to industrial land uses at the northern end. Two parks are within the local area: Raimondi and Willow. Raimondi Park is located at 18th and Wood streets, and Willow Park is located at 14th and Willow streets. A park is proposed at the Bay Bridge touchdown peninsula at the end of Burma Road. Several public and private schools are located within the local area: Prescott Elementary, Prescott Development Center, St. Martins Peporres, McClymonds High, Head Start, and the Oakland Military Institute College Preparatory Academy. The nearest public medical facility to the local area is the West Oakland Health Center (700 Adeline Street), about 0.8 mile from the OARB. There are also two churches in the local area: Beth Eden Baptist Church (1183 Tenth Street), and St. Mary-St. Francis de Sales (707 Jefferson Street).

Alternative Baseline, Ambient Noise

A literature search revealed no data to quantitatively describe the OARB ambient noise environment in the 1995 alternative baseline year. However, two relevant documents provide primarily qualitative characterizations of the noise environment—the Army's EIS for the disposal and reuse of the OARB (Corps 1999 and 2001) and the *Berths 55-58 Project Draft EIR* (Port of Oakland 1998).

According to the Army's EIS for disposal and reuse of the OARB, primary sources of noise from the OARB (before it was closed in 1995) were trains on the Oakland Terminal Railway running to Wharf 7 and diesel engines of trucks driving to and from Port of Oakland terminal areas (Corps 1999 and 2001). The EIS states the single 100-ton wharf crane was a secondary, but fairly minor, source of noise. The Base typically operated between the hours of 6 a.m. to 5 p.m. When a ship was in port (once per month on average), loading and unloading operations usually take place around the clock. Major noise sources, other than activities at the OARB, included vehicle traffic on I-80, West Grand Avenue, and Maritime Street; train traffic in the Union Pacific (UP) West Oakland Railyard; and aircraft overflights from San Francisco International and Oakland International airports. In 1995, the Cypress Freeway (I-880) was not completed or operational near the study area. According to the *Berths 55-58 Project Draft EIR*, in 1992, receptors on West Oakland streets near the Cypress Freeway corridor experienced noise levels ranging from 61 to 74 dBA L_{eq} (time interval not specified) (Port of Oakland 1998).

The *Berths 55-58 Project Draft EIR* provides a qualitative description of existing noise sources in the OARB EIR study area.[2] Primary noise sources included port-related maritime uses in the

[2] The extent of the Berths Draft EIR noise study area in West Oakland is approximately the same as the study area of the OARB Redevelopment EIR.

Maritime sub-district (ships, trucks, and rail operations), truck traffic on local streets, BART, Amtrak and other Union Pacific rail operations (Port of Oakland 1998).

Over the past four to ten years, circumstances in the study area have occurred that have both lowered and increased local noise levels. Completion of I-880 increased nearby vehicle traffic volume, thus increasing noise. Reduced ship, train, and truck activity at the OARB (due to the Base's closure) decreased noise levels.

Although noise sources have changed, overall ambient noise levels in the local area have not changed substantially since 1995. Therefore, a quantitative description of the 1995 noise environment, with the exception of I-880–generated noise, can be represented by use of the current (2001) ambient noise environment, as described above.

4.5.5 Impact Analysis Methodology

As allowed by CEQA, where relevant, the analysis of impacts of community reuse of a military facility may be based on environmental conditions that existed at the time the federal government made the decision to close the base, rather than current existing conditions. For the OARB, the decision was made in 1995. As described above, appreciable differences in the ambient noise environment between 1995 and 2001 have not occurred.

Noise impacts disclosed in this EIR do not include noise from sources previously disclosed and for which mitigation was required in two publicly reviewed and certified environmental documents (Port of Oakland 1998, and Port of Oakland 1999), or (as described above) from those sources associated with operation of the OARB in 1995, the alternative baseline year.

The noise sources identified in the Berths 55-58 EIR were construction (excavation, dredging, earthmoving), operational and maintenance, vehicle and vessel traffic and the fact that public access areas would be developed adjacent to noise sources. All impacts, except construction, were evaluated to be less than significant, not warranting mitigation. Mitigation for construction noise impacts are similar, if not identical, to the mitigation presented in Section 4.5.7.

The noise sources identified in the JIT EIR were construction (grading, earthmoving, general construction), operational (train movements, yard cargo-handling and trucks), increase rail activity at the Knight Yard, and project-related noise increases at receptors near local rail lines. All impacts, except construction, were evaluated to be less than significant, not warranting mitigation. Mitigation for construction noise impacts is similar, if not identical, to the mitigation presented in Section 4.5.7.

The noise analysis for this EIR is consistent with the level of detail currently available regarding redevelopment, as presented in Chapter 3: Description.

Significance Criteria

Redevelopment would have a significant impact on the environment if it would:

- Expose persons to or generate noise levels in excess of standards established in the Oakland General Plan or applicable standards of other agencies (*e.g.*, the Occupational Health and Safety Administration);
- Violate the City of Oakland Noise Ordinance (Oakland Planning Code § 17.120.050) regarding operational and construction noise as presented in Tables 4.5-1 and 4.5-2,[3]
- Violate the City of Oakland Noise Ordinance (Oakland Planning Code § 8.18.020) regarding nuisance of persistent construction-related noise;
- Create a vibration that is perceptible without instruments by the average person at or beyond any lot line containing vibration-causing activities not associated with motor vehicles, trains, and temporary construction or demolition work, except activities located within the (a) M-40 zone or (b) M-30 zone more than 400 feet from any legally occupied residential property (Oakland Planning Code § 17.120.060);
- Generate interior L_{dn} or CNEL greater than 45 dBA for multi-family dwellings, hotels, motels, dormitories, or long-term care facilities (and if extended by local legislative action, single-family dwellings) per California Noise Insulation Standards (CCR Part 2, Title 24);
- Result in a 5 dBA permanent increase in ambient noise levels in the vicinity above levels existing without redevelopment;
- Conflict with state land use compatibility guidelines (OPR 1998) for all specified land uses for determination of acceptability of noise levels as shown in Figure 4.5-1;
- Be located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, and would expose people residing or working in the project area to excessive noise levels; or
- Be located within the vicinity of a private airstrip, and would expose people residing or working in the project area to excessive noise levels.

Not all criteria above apply to redevelopment as proposed. While pile-driving during construction in the 16th/Wood sub-district may result in vibration perceptible at residential receptors, construction activity is an exception of that portion of the Oakland Planning Code that comprises the significance criteria. The nearest redevelopment activity that could result in vibration due to operations would be the New Intermodal Facility, located approximately 1,100 feet from the nearest residential land use, with an existing intervening major freeway and rail facilities. Due to the distance to residential receptors, vibration generated by operational activities at the New Intermodal Facility are not expected to be perceptible at residential receptors. The interior CNEL criterion does not apply to proposed redevelopment because no existing relevant noise-sensitive land uses[4] are proximate to the project area. Subsequent redevelopment activities

[3] Table 4.5-2 applies to construction noise, except if an acoustical analysis is performed and all feasible mitigation measures imposed, including standard noise measures adopted by the City Council in January 2001.

[4] Such land uses include multi-family dwellings, hotels, motels, dormitories, or long-term care facilities.

would be required to comply with state laws and regulations, and impacts would be avoided. Redevelopment would incorporate state land use compatibility guidelines promulgated by the state for determination of acceptability of noise levels; as such, redevelopment would not conflict with state guidelines, and no impact would occur. While the redevelopment project area is located within the General Referral Area of the ALUPP, it is not located within a Noise or Safety Referral Zone. The project area is not located within two miles of a public airport or private airstrip.

4.5.6 Impacts

Impact 4.5-1: Construction could result in short-term noise levels in excess of established standards, or that violate the City of Oakland Noise Ordinance at and near the redevelopment project area, and along construction haul routes.

Significance: Potentially significant

Mitigation 4.5-1: Developers and/or contractors shall develop and implement redevelopment-specific noise reduction plans.

Residual Significance: Less than significant

Build-out is expected by 2020. Construction activities are expected to occur within all of the sub-districts. The primary purpose of redevelopment is the elimination of blighting influences. In general, this would involve demolition/deconstruction, selected remediation, grade correction and site preparation, excavation and filling, and infrastructure installation. Specifically, it would include realignment of Maritime Street and utilities located within that right-of-way, construction of a new Maritime Street extension (the "loop road"), reconfiguration of the Outer Harbor shoreline for New Berth 21, construction of the Gateway Park, construction of the New Intermodal Facility, and creation of public access. In addition, subsequent redevelopment activities would include construction of internal circulation, buildings, parking, landscaping, etc.

Noise levels would increase within the redevelopment project area and adjacent areas from operation of construction equipment. In the OARB and Maritime sub-districts, pile driving would be required for construction of wharves (installation of pilings and possibly sheet pile), as well as buildings, which due to geotechnical conditions, are expected to be built on friction piles. Table 4.5-3 summarizes typical major noise source equipment expected to be used during redevelopment construction activities.

Table 4.5-3
Major Sources of Construction Noise

Activity	Source	Typical L_{eq} (dBA) at 50 Feet
Demolition/deconstruction	Bulldozers, concrete crushers, backhoes, loaders, trucks	80 to 91 dBA
Site preparation, construction of roads, utilities, parking areas	Bulldozers, backhoes, scrapers, compacters, trucks	80 to 91 dBA
Shoreline reconfiguration	Dredges, excavators, trucks	67 dBA (dredge at 250 feet) 80 to 91 dBA (excavators and trucks)
Wharf construction, building foundations	Pile drivers, trucks	101 dBA (L_{max} for pile driver) 80 to 91 dBA (L_{eq} for trucks)

Source: Port of Oakland 1998, Table 3.4-3.

Details of redevelopment construction are not fully defined: equipment to be used, its proximity to receptors, etc., is not yet known. Because occurrence of this impact relies on details of construction not completely defined, the impact is considered potentially significant. With implementation of Mitigation Measure 4.5-1, compliance with the Noise Ordinance is considered to be achieved, and the residual impact is considered less than significant.

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Impact 4.5-2: Operation of redevelopment facilities could result in a long-term increase in ambient noise levels.

Significance: Less than significant

Mitigation: Mitigation is not warranted.

The proposed land use classification for the majority of the Gateway development area is Business Mix. Business Mix is intended to be a flexible classification, and allows a wide variety of business and related commercial and industrial uses. The primary sources of noise stemming from this activity would likely be low-speed vehicle traffic, including light- and medium-duty trucks.

The Park & Urban Open Space classification proposed for the Gateway Park area and for the gateway development area waterfront would be a place for recreation; as such, it would be considered a receiver of noise, rather than a noise generator. However, community/civic events at these spaces may generate off-peak noise-generating automobile traffic in the area.

The proposed land use classification for the Port development area is General Industrial/Transportation. This classification allows heavy industrial uses, including manufacturing, railyards, maritime operations, and other similar uses. Primary noise sources would likely be heavy-duty trucks, trains, ships, cargo equipment, and other cargo operations.

The Maritime sub-district, with the largest acreage of all of the sub-districts, would support ongoing and proposed Port of Oakland industrial maritime operations. Primary noise sources would include ships (horn-blowing and docking procedures), cargo-handling operations, trucking, and trains. Although these types of noise sources currently exist, cargo throughput is expected to increase, and increased noise levels would result from related equipment, truck, and rail activities.

A portion of the 16th/Wood sub-district is immediately west of existing residential land use in West Oakland. The sub-district is currently classified as Business Mix, and is expected to remain in that classification. It may contain as many as 375 live/work units in addition to buildings for office, retail, and light industrial use. Primary sources of noise would likely be automobile and light-duty truck traffic.

Because the primary noise sources would be vehicle traffic and rail operations, the focus of the noise analysis for this impact was vehicle traffic and rail operations. Table 4.5-4 presents data regarding freeway segment noise levels for the morning and afternoon peak traffic periods, and Table 4.5-5 presents data for study area intersections (non-freeway roads) for the same periods. As demonstrated by these data, no freeway segment or roadway intersection would experience an increase in noise of 5 dBA or greater as a result of redevelopment, and the impact is considered less than significant.

In terms of rail traffic, redevelopment is expected to increase the number of daily trains serving the Port by two (from 23.4 to 25.4) over the daily number disclosed in previously certified and publicly reviewed EIRs (Dowling Associates, Inc. 2002). The increase would be less than 10 percent over current train trips, and assuming the additional trains have the same operating characteristics as those previously analyzed, average daily noise levels from the additional line haul trains would increase by less than 1 dBA.

Table 4.5-4
Changes in Traffic Noise Along Freeway Segments

		A.M. Peak			P.M. Peak		
Freeway Segment	**Travel Direction**	**Baseline Traffic**	**Program Traffic[a]**	**Increase in dB**	**Baseline Traffic**	**Program Traffic[a]**	**Increase in dB**
I-80 at the Bay Bridge	East	5,813	436	0.3	11,252	103	0
	West	10,929	105	0	7,448	421	0.2
I-80 between I-880 and I-580	East	3,917	144	0.2	7,581	785	0.4
	West	7,364	823	0.5	5,019	174	0.1

Table 4.5-4
Changes in Traffic Noise Along Freeway Segments

Freeway Segment	Travel Direction	A.M. Peak			P.M. Peak		
		Baseline Traffic	Program Traffic[a]	Increase in dB	Baseline Traffic	Program Traffic[a]	Increase in dB
I-80 East of I-80/I-580 Split	East	5,751	213	0.2	11,131	830	0.3
	West	10,813	855	0.3	7,369	204	0.1
I-880 Connector to I-80 East	North	2,837	213	0.3	3,131	831	1
	South	2,433	855	1.3	2,080	204	0.4
I-880 Connector to I-80 West	North	1,700	250	0.6	1,746	1,206	2.3
	South	1,074	1,258	3.4	1,801	277	0.6
I-880 North of 7th Street	North	2,849	16	0	3,844	18	0
	South	2,513	25	0	4,056	7	0
I-880 South of 7th Street	North	4,679	898	0.8	4,203	231	0.2
	South	2,715	277	0.4	4,797	860	0.7
I-880 North of I-980	North	4,846	882	0.7	3,805	213	0.2
	South	2,208	224	0.4	4,395	694	0.6
I-880 South of I-980	North	7,680	830	0.4	7,282	209	0.1
	South	4,967	293	0.2	6,618	784	0.5
I-880 North of I-238	North	7,295	620	0.4	8,120	157	0.1
	South	7,856	232	0.1	7,380	582	0.3
I-880 South of I-238	North	6,842	580	0.4	8,185	145	0.1
	South	8,940	178	0.1	7,815	556	0.3
I-238	East	2,771	54	0.1	4,788	26	0
	West	4,629	40	0	2,001	12	0
I-580 East of I-238	East	5,017	54	0	8,670	26	0
	West	8,383	40	0	3,623	12	0
I-580 West of I-238	East	5,008	44	0	6,078	249	0.2
	West	5,458	256	0.2	5,422	56	0
I-580 East of I-980/SR-24	East	6,091	124	0.1	8,482	671	0.3
	West	7,399	693	0.4	6,618	153	0.1
I-580 West of I-980/SR-24	East	7,682	144	0.1	10,873	785	0.3
	West	10,373	822	0.3	9,027	174	0.1
I-980	East	2,792	15	0	5,866	26	0
	West	5,792	30	0	2,834	11	0

Table 4.5-4
Changes in Traffic Noise Along Freeway Segments

Freeway Segment	Travel Direction	A.M. Peak Baseline Traffic	A.M. Peak Program Traffic[a]	A.M. Peak Increase in dB	P.M. Peak Baseline Traffic	P.M. Peak Program Traffic[a]	P.M. Peak Increase in dB
SR-24 East of I-580	East	2,758	118	0.2	7,184	515	0.3
	West	7,437	528	0.3	3,216	127	0.2

Source: Traffic information from "Freeway LOS.xls," Dowling Associates, Inc. 2002.

Note: [a] In passenger car equivalents (one truck = two cars).

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Table 4.5-5
Changes in Traffic Noise Along Non-Freeway Roads

Intersection	A.M. Peak Baseline Traffic	A.M. Peak Program Traffic	A.M. Peak Increase in dB	P.M. Peak Baseline Traffic	P.M. Peak Program Traffic	P.M. Peak Increase in dB
West Grand/Maritime	1,580	281	0.7	2,000	27	0.1
West Grand/Frontage Road	2,045	27	0.1	2,695	268	0.4
West Grand/Mandela	1,879	137	0.3	2,087	139	0.3
West Grand/Adeline	1,841	129	0.3	2,577	132	0.2
West Grand/Market	2,111	1,016	1.7	2,217	1,035	1.7
West Grand/San Pablo Avenue	2,548	794	1.2	2,888	801	1.1
West Grand/MLK Jr	1,930	797	1.5	2,273	804	1.3
West Grand/Northgate	2,369	798	1.3	2,814	803	1.1
West Grand/Harrision	3,991	258	0.3	4,853	254	0.2
7th/Maritime	1,145	846	2.4	1,202	672	1.9
7th/I-880 SB Ramp	989	770	2.5	987	1,029	3.1
7th/I-880 North Ramp	1,386	1,236	2.8	1,485	916	2.1
7th/Peralta	819	122	0.6	792	122	0.6
7th/Mandela	1,215	129	0.4	1,240	127	0.4
7th/Union	1,498	128	0.4	1,389	128	0.4
7th/Adeline	1,803	334	0.7	1,662	338	0.8
7th/Market	1,870	330	0.7	1,814	304	0.7
7th/Harrison	2,895	173	0.3	3,215	42	0.1
7th/Jackson	2,119	170	0.3	2,483	41	0.1
6th/Jackson	2,244	170	0.3	2,534	41	0.1

Table 4.5-5
Changes in Traffic Noise Along Non-Freeway Roads

Intersection	A.M. Peak			P.M. Peak		
	Baseline Traffic	Program Traffic	Increase in dB	Baseline Traffic	Program Traffic	Increase in dB
5th/Union/I-880 Ramps	2,058	69	0.1	1,527	179	0.5
5th/Adeline	2,013	237	0.5	1,751	321	0.7
I-880 Off Ramp/Market	1,327	146	0.5	1,145	55	0.2
5th/Broadway	1,986	44	0.1	2,798	178	0.3
3rd/Adeline	828	232	1.1	923	141	0.6
3rd/Market	714	104	0.6	674	49	0.3
14th/Mandela	738	329	1.6	707	357	1.8
12th/Brush	2,875	30	0.0	1,718	11	0.0
12th/Castro	987	20	0.1	2,658	31	0.1
27th/SR 24-580 Off Ramp	2,226	394	0.7	1,547	278	0.7
27th/SR 24-580 On Ramp	1,611	78	0.2	2,885	356	0.5
San Pablo Avenue/Adeline	2,318	137	0.2	2,858	135	0.2
West MacArthur/Market	1,327	137	0.4	2,176	134	0.3
Powell/I-80 Frontage Road	3,171	52	0.1	4,271	53	0.1
Powell/I-80 NB Ramps	3,447	61	0.1	4,562	94	0.1
Powell/Christie	2,990	52	0.1	4,294	52	0.1
Powell/Hollis	1,836	52	0.1	2,976	52	0.1
Powell/San Pablo	3,551	52	0.1	3,516	52	0.1
Stanford/Market	2,115	52	0.1	2,798	54	0.1
Stanford/MLK Jr.	3,793	13	0.0	5,034	14	0.0
Ashby/7th	2,956	103	0.1	3,183	106	0.1
Ashby/San Pablo	3,886	104	0.1	4,142	104	0.1
Marina Village/Constitution	2,117	103	0.2	2,520	106	0.2
Atlantic/Webster	3,021	103	0.1	2,816	105	0.2
Atlantic/Constitution	1,979	103	0.2	2,236	106	0.2
Maritime/New Gateway access road	N/A	601	N/A	N/A	541	N/A

Source: Traffic information from Dowling Associates, Inc. 2002.

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At its nearest point to West Oakland residential land uses, the New Intermodal Facility would be approximately 1,100 feet from noise-sensitive receptors. The existing JIT is located approximately 2,600 feet from the same receptors. Both the UP West Oakland and Desert yards are located closer to these receptors than either the existing JIT or the proposed New Intermodal Facility. Yard activities in the New Intermodal Facility are expected to increase, potentially increasing train noise levels by 6 dBA at a distance of 1,100 feet. However, intervening major facilities, such as I-880 and its soundwalls, and the Desert Yard are expected to attenuate this increase in noise to well below 5 dBA at the receptors, and the impact is considered less than significant. Ambient noise levels in the study area are expected to continue to be dominated by noise from I-880, BART, and aircraft overflights.

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4.5.7 Mitigation

Implementation of the following mitigation measures will avoid, minimize, reduce, rectify, or compensate for significant impacts of redevelopment.

Mitigation 4.5-1. Developers and/or contractors shall develop and implement redevelopment-specific noise reduction plans.

This measure applies to Impact 4.5-1 and Cumulative Impact 5.5-1.

This measure shall be enforced via contract specifications. The measure as written is intended to effectively limit construction noise, while allowing the sponsors of redevelopment activities and their contractors flexibility in controlling site-specific noise.

Each developer and/or contractor should be contractually required to demonstrate knowledge of the Oakland Noise Ordinance, and to construct in a manner whereby noise levels do not exceed significance criteria. Contractors may elect any combination of legal, non-polluting methods to maintain or reduce noise to thresholds levels or lower, as long as those methods do not result in other significant environmental impacts or create a substantial public nuisance. The developer and/or contractor shall perform a site-specific acoustical analysis, and, if necessary, shall develop and implement a noise reduction plan subject to review and approval by the City or Port. The plan for attenuating these noises shall include some or all of the following measures, as appropriate and feasible, and shall be implemented prior to any required activities.

Schedule

- Schedule operation of one piece of equipment that generates extreme levels of noise at a time.
- Schedule activities that generate low and moderate levels of noise during weekend or evening hours.

- Standard construction activities shall be limited to between 7:00 a.m. and 7:00 p.m. Monday through Friday. No construction activities shall be allowed on weekends until after the building is enclosed without prior authorization of the Building Services and Planning Divisions of the Community and Economic Development Agency, or unless expressly permitted or modified by the provisions of a building and/or grading permit.

Pile Driving and/or Other Activities that Generate Extreme Levels of Noise for Noise Levels Greater than 90 dBA

- Pile-driving and/or other activities that generate noise above 90 dBA shall be limited to between 8:00 a.m. and 4:00 p.m., Monday through Friday, with no activity generating extreme levels of noise permitted between 12:30 and 1:30 p.m. No construction activities that generate extreme levels of noise shall be allowed on Saturdays, Sundays, or holidays unless expressly permitted or modified by the provisions of a building and/or grading permit.

- Install engine and pneumatic exhaust controls as necessary to ensure exhaust noise from pile driver engines are minimized. Such controls can reduce noise levels by 6 dBA L_{eq}.

- Employ sonic or vibratory pile drivers (sonic pile drivers are only effective in some soils). Such drivers may reduce maximum noise levels by as much as 12 dBA (L_{max}). In some cases however (*e.g.*, sheet pile driving) vibratory pile drivers may generate more noise than impact pile drivers/methods. The specific circumstances should be evaluated.

- Tie rubber aprons lined with absorptive material around sheetpile.

- Hydraulically drive piles.

- Pre-drill pile holes.

- Erect temporary plywood noise barriers around the entire construction site.

- Use noise control blankets on the building structure as it is erected to reduce noise emission from the site.

- Evaluate the feasibility of noise control at the receivers by temporarily improving the noise reduction capability of adjacent buildings.

- Monitor the effectiveness of noise attenuation measures by taking noise measurements.

Other Equipment, Methods

- A pre-construction meeting shall be held with the job inspectors and the general contractor/on-site project manager to confirm that noise mitigation and practices are completed prior to the issuance of a building permit (including construction hours, neighborhood notification, posted signs, etc.).
- All construction equipment, fixed and mobile, and motor-vehicles shall be properly maintained to minimize noise generation. This would include maintaining equipment silencers, shields, and mufflers in proper operating order. “Quiet package” or “hush” equipment, which is readily available for such equipment as trailer-mounted compressors,

welders, etc. shall be used. All equipment shall be operated in the quietest manner practicable.

- Equipment and trucks used for construction shall use best available noise control techniques (*e.g.*, improved mufflers, equipment redesign, use of intake silencers, ducts, engine enclosures, and acoustically attenuating shields or shrouds, wherever feasible).
- Impact tools (*e.g.*, jack hammers, pavement breakers, and rock drills) used for construction shall be hydraulically or electrically powered wherever possible to avoid noise associated with compressed-air exhaust from pneumatically powered tools. However, where use of pneumatic tools is unavoidable, an exhaust muffler on the compressed-air exhaust should be used; this muffler can lower noise levels from the exhaust by up to about 10 dBA. External jackets on the tools themselves shall be used where feasible, which could achieve a reduction of 5 dBA. Quieter procedures should be used, such as drills rather than impact equipment, where practicable.
- Stationary noise sources should be located as far from sensitive receptors as possible, and they should be muffled and enclosed within temporary sheds, or insulation barriers, or other measures should be incorporated to the extent feasible.
- Material stockpiles and/or vehicle staging areas should be located as far as practicable from dwellings.
- Public address systems would be designed and to minimize "spill over" of sound onto adjacent properties.
- Physical barriers/screens (*e.g.*, along fence lines) may be used to attenuate noise.
- Project workers exposed to noise levels above 80 dBA would be provided personal protective equipment for hearing protection (*i.e.*, ear plugs and/or muffs).
- Areas where noise levels are routinely expected to exceed 80 dBA would be clearly posted "Hearing Protection Required in this Area."
- A process with the following components shall be established for responding to and tracking complaints pertaining to construction noise:
  - A procedure for notifying City Building Division staff and Oakland Police Department;
  - A list of telephone numbers (during regular construction hours and off-hours);
  - A plan for posting signs on-site pertaining to complaint procedures, permitted construction days and hours, day and evening contact telephone numbers for the job site and day and evening contact telephone numbers for the City in the event of a problem;
  - Designation of a construction complaint manager for the project who will respond to and track complaints; and
  - Notification of neighbors within 300 feet of the project construction area at least 30 days in advance of construction activities.

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