3.6 NOISE

The following section provides a discussion of existing noise conditions on the site and in the site vicinity, potential noise impacts from redevelopment under the EIS Alternatives and measures to mitigate redevelopment-related noise impacts. This section is based on the *Noise Quality Technical Report* (December 2007) prepared by Landau Associates, Inc. The full report is included as **Appendix J** to this EIS.

This analysis provides a quantitative estimate of traffic-related noise impacts and a qualitative discussion of environmental noise. Details about the basic methodology, equipment and modeling tools used to develop this analysis are provided in **Appendix J**.

3.6.1 Affected Environment

Noise Level Terminology and Human Hearing

Noise is defined as unwanted sound. In assessing the impact of noise upon the environment, the nature and level of activities that generate the noise, the pathway through which the noise travels, the sensitivity of the receptor, the period of exposure and the increase over the ambient noise levels are all considered.

Sound level descriptors are ways of measuring and describing noise, including factors that account for sound duration, magnitude, frequency and pitch. Sound is measured in decibels (dB), a logarithmic ratio between pressures caused by a given sound spectrum. Environmental noise is measured as "A-weighted" sound level in decibels, symbolized as dBA. The A-weighted scale represents noise using the scale that corresponds closest to the range and characteristics of the human ear. Equivalent sound level (Leq) is a common descriptor for measuring fluctuating sounds. People generally cannot detect a change of 1 dBA. A 3 dBA change is considered a just-perceivable difference. A change of 5 dBA in a given noise source or environment would be likely to be perceived by most people under normal listening conditions. **Table 3.6-1** identifies sound levels of typical noise sources and activities (see **Appendix J** for further detail on noise level terminology).

Noise attenuation is logarithmic rather than linear. For example, a doubling of traffic volumes will result in a 3 dBA increase in traffic-dominated noise environments. For line sources, such as streets, noise levels decrease by 3 to 5 dBA for every doubling of distance from the source. For point sources, noise levels decrease more rapidly at approximately 6 dBA for every doubling of distance from the source. Topography and the type of surface (paved or vegetated) on the site also play a role in noise attenuation characteristics.

Regulatory Framework

Federal, state and local governments have established noise standards and guidelines to protect citizens from adverse effects associated with noise. These regulations are divided into three groups: traffic-related noise, environmental noise, and construction noise. The guidelines and regulations that pertain to noise conditions in the New Whatcom study area are discussed below.

Table 3.6-1
NOISE LEVELS OF REPRESENTATIVE SOUNDS

Noise Source (distance)	Decibels (dBA)	Description
Jet takeoff (nearby)	150	
Pneumatic riveter	130	
Jet takeoff (60 meters)	120	Pain threshold
Construction noise (3 meters)	110	
Subway train	100	
Heavy truck (15 meters)	90	Constant exposure above this level endangers hearing
Average factory	80	
Busy traffic	70	
Normal conversation (1 meter)	60	
Quiet office	50	Quiet
Library	40	
Soft whisper (5 meters)	30	Very quiet
Rustling leaves	20	
Normal breathing	10	Barely audible
Hearing threshold	0	

Source: Tipler, 1976

Traffic-Related Noise Regulations

Federal Highway Administration

The Federal Highway Administration (FHWA) provides policies for state highway agencies in the *Procedures for Abatement of Highway Traffic Noise and Construction Noise* in the *U.S. Code of Federal Regulations* (23 CFR 772). These regulations pertain to traffic noise associated with new or improved transportation projects. **Table 3.6-2** provides the criteria established by 23 CFR 772. FHWA guidance states that effects from traffic noise "occur when the predicted traffic noise levels approach or exceed the noise abatement criteria or when the predicted traffic noise levels substantially exceed the existing noise levels" (23 CFR §772.5[g]). Individual states are delegated the responsibility to establish a definition of "substantially exceed" (see discussion under *Washington State Department Transportation* below). If it is determined that a traffic project may create the potential for an adverse effect from noise based on the state defined criteria, the FHWA requires that noise mitigation measures be evaluated with primary consideration given to exterior areas with frequent human use. Effects and potential mitigation for transportation projects are only considered for existing sensitive receivers and for future sensitive receivers created by permitted development projects.

Washington State Department of Transportation

As mandated by FHWA, the Washington State Department of Transportation (WSDOT) has established Noise Abatement Criteria (NAC) that specify exterior traffic noise level limits for various land activity categories where frequent human use occurs, as presented in **Table 3.6-2**.

Table 3.6-2
FEDERAL HIGHWAY ADMINISTRATION / WASHINGTON STATE DEPARTMENT OF TRANSPORTATION NOISE ABATEMENT CRITERIA

Activity Category	Leq in dBA	Description of Activity Category
A	57 (exterior)	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose
B	67 (exterior)	Picnic areas, recreation areas, playgrounds, active sports areas, parks, residences, motels, hotels, schools, churches, libraries, and hospitals
C	72 (exterior)	Developed lands, properties, or activities not included in Categories A or B above
D	–	Undeveloped lands
E	52 (interior)	Residences, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals, and auditoriums

Source: FHWA, WSDOT

FHWA and WSDOT regulations characterize the effects of traffic noise based on whether noise levels approach (within 1 dBA of the NAC) or exceed the NAC. For example, the exterior NAC for residences, parks, schools, churches, hospitals, and similar areas is 67 dBA. An adverse effect from traffic noise would occur at these receivers if anticipated exterior noise levels reach 66 dBA or higher. Similarly, the noise abatement criterion for commercial establishments is 72 dBA. An adverse effect from traffic noise would occur at these locations if predicted noise levels are 71 dBA or higher.

WSDOT defines a 10 dBA increase as a "substantial increase" if the resulting noise level is greater than 50 dBA. Outdoor activity areas with noise levels of 75 dBA or higher and indoor areas with noise levels of 60 dBA or higher are defined as in "severe exceedance of the NAC." Future noise levels predicted to increase 15 dBA or higher over existing noise levels may also be considered in "severe exceedance".

City of Bellingham

The City of Bellingham (City) does not have a specific noise ordinance regarding traffic noise. The City has adopted the Washington State Department of Ecology (Ecology) environmental noise regulations as defined in WAC 173-60; however, these regulations do not apply to traffic noise (see discussion under Environmental Noise Regulations below).

Environmental Noise Regulations

State and Local Regulations

Ecology regulates environmental noise (WAC 173-60), which is limited to noise sources such as concerts, generators, manufacturing plants, and other commercial/industrial operational

activities. Vehicular traffic and train noise are exempt from Ecology's environmental noise limitations.

Ecology is responsible for establishing maximum noise levels allowed in an area or environment and limitations of noise at property lines (WAC 173-60). Ecology's regulations specify land use categories called Environmental Designations for Noise Abatement (EDNA) which correspond to residential, commercial, and industrial zoning classifications determined by the City. The maximum noise level allowed at a property boundary depends on the current EDNA of both the noise source and receiving property. The EDNA classifications are:

- Class A: Often classified by local governments as residential. Lands where human beings reside and sleep: residences, multiple family living accommodations, recreational and entertainment properties (camps, parks, and camping facilities), and community services (hospitals, health and correctional facilities).

- Class B: Often classified by local governments as commercial. Lands involving uses that require protection against noise interference with speech: retail services, recreation and entertainment not used for habitation (schools, churches, cultural facilities), and commercial living/dining establishments (hotels/motels, restaurants).

- Class C: Often classified by local governments as industrial. Lands involving economic activities of such a nature that higher than average noise levels are to be anticipated: storage and warehouse facilities, property used for production of crops, and wood products or livestock.

Compliance with these regulatory limits is judged separately for individual sources. The regulations prohibit a single noise source from generating more than the specified amount of sound at a receiving location. The regulations do not require the cumulative sound generated by all sources to remain below the specified levels. Maximum permissible noise levels are established for each class of property. These noise levels are outlined in **Table 3.6-3**.

Table 3.6-3
MAXIMUM PERMISSIBLE ENVIRONMENTAL NOISE LEVELS (in dBA)

EDNA Noise Source	EDNA Receiving Property		
	Class A	Class B	Class C
Class A	55	57	60
Class B	57	60	65
Class C	60	65	70

Source: WAC 173-60

Although not specifically stated in the WAC regulations, the noise abatement criteria are assumed to be presented as Leq (equivalent sound level). For example, for areas that fall under Class A, the noise abatement criterion is an Leq of 60 dBA when the noise originates from a Class C site. For areas that fall under Class B, the noise abatement criterion is an Leq of 65 dBA, when the noise originates from a Class C site. For areas that fall under Class C, the noise abatement criterion is an Leq of 70 dBA when the noise originates from a Class C site.

Between the hours of 10:00 PM and 7:00 AM, the noise limitations are reduced by 10 dBA for receiving properties within Class A areas. However, at any hour of the day, the applicable noise limitations may be exceeded by no more than one of the following:

- 5 dBA for a total of 15 minutes in any 1-hour period
- 10 dBA for a total of 5 minutes in any 1-hour period
- 15 dBA for a total of 1.5 minutes in any 1-hour period.

There are a number of environmental noise source exemptions provided in WAC 173-60-040 that may pertain to the New Whatcom redevelopment, including:

- Sounds created by motor vehicles,
- Sounds originating from aircraft in flight and sounds that originate at airports directly related to flight operations,
- Sounds created by surface carriers engaged in interstate commerce by railroad,
- Sounds originating from officially sanctioned parades and other public events,
- Sounds originating from temporary construction sites as a result of construction activity (except insofar as such provisions relate to the reception of noise within Class A EDNAs between the hours of 10:00 PM and 7:00 AM), and
- Noise from electrical substations and existing stationary equipment used in the conveyance of water, wastewater, and natural gas by a utility, between the hours of 7:00 AM and 10:00 PM.

In addition to the adoption of Ecology's environmental noise regulations, the City has established a Public Disturbance Noise Ordinance (BMC 10.24.120). This ordinance applies subjective "public disturbance noise" standards, which do not require the use of decibel meters for enforcement. The current City code provides for local regulation of frequent, repetitive, or continuous sounds within a residentially zoned area that may be found to unreasonably disturb or interfere with the peace, comfort, and repose of others.

Construction Noise Regulations

Federal Highway Administration

FHWA does not typically require modeling or detailed analysis for construction traffic noise due to the temporary nature of this type of noise. Most construction noise will not trigger requirements for detailed analysis or modeling provided that construction is scheduled for daylight hours and the construction period will be short-term or phased to provide noise-related relief to nearby sensitive receivers. FHWA does require that potential impacts be generally identified and a reasonable effort made to include abatement measures into the plans and specifications of transportation projects (23 CFR §772.19).

State and Local Regulations

Daytime noise from construction activities is generally exempt from state and local laws per WAC 173-60. These regulations acknowledge that construction noise is temporary but may affect nearby property owners or residents. Ecology and WSDOT recommend that project development, planning and design documents incorporate all reasonable methods of noise mitigation for construction activities.

The City of Bellingham regulates construction site noise by establishing designated hours for permitted construction for certain zones (i.e. near residential areas) and through a provision in the general noise control ordinance. The Public Disturbance Noise Ordinance within the Bellingham Municipal Code (BMC) limits construction noise within residentially zoned areas during the hours of 7:00 AM and 10:00 PM (BMC 10.24.120).

Existing Site Conditions

The existing acoustic environment varies throughout the New Whatcom site and surrounding area due to a variety of factors including existing terrain, land uses, traffic volumes/roadway systems and the railroad corridor.

The terrain at the New Whatcom site is generally flat. Offsite steep terrain exists on the north side of Roeder Avenue and the south side of Cornwall Avenue near portions of the New Whatcom site. This steep terrain affects the propagation of sound within the site area.

Existing land uses on the site primarily include vacant buildings and paved area. Some industrial uses exist onsite, primarily in Areas 1, 2, 6 and 9. Although the site supports a variety of industrial land uses, these onsite noise sources (including noise from trucks and marine vessel activity) are considered to contribute limited noise to the existing ambient conditions in the area.

Existing land uses adjacent to the site include single-family and multi-family residences, a city park adjacent to West Holly Street, a trail south of Cornwall Avenue, and numerous industrial and commercial spaces. The existing noise environment in the vicinity of the site is typical of urban areas and is characterized by noise levels generated by vehicular traffic on nearby streets and highways, passing trains, occasional aircraft flyovers, barking dogs, lawn mowers, etc.

Vehicular traffic on the existing roadway network is the dominant noise source in the study area. The primary noise roadways include Roeder Avenue to East Chestnut Street, West Holly Street, and North State Street to Boulevard Street. Each of these roadways carries traffic within the vicinity of sensitive noise receivers within the study area. Traffic noise in these areas is intermittent and varies with traffic signal timing and traffic volumes.

Noise is also generated by the Burlington Northern Santa Fe (BNSF) railway corridor that runs to the north of Roeder Avenue, through the site and parallel to Boulevard Street at the south end of the site. Based on operational information provided by BNSF, an average of four freight trains make round-trip circuits through the Bellingham area each day en route to and from Canada. Other train activity includes three local freight trains serving businesses within the City, and one night freight train from Bellingham to Everett (Fishman, 2007). Passenger service along the BNSF railway corridor is operated by Amtrak. The nearest passenger station is the transit center south of the New Whatcom site located at 401 Harris Avenue in Bellingham.

Amtrak's Cascades route provides four daily trains (two southbound trains and two northbound trains) along the railway corridor from Vancouver, British Columbia to Eugene, Oregon.

For discussion purposes, train noise was noted during a field visit and was measured while the trains were passing. Train noise within the study area was found to contribute substantially to the ambient noise environment and was documented to sustain 78 to 82 dBA noise levels while passing. It is expected that freight and passenger railroad operations, and therefore, this noise source will continue for the foreseeable future with some limited growth. As discussed in the Environmental Noise Regulations section above, train noise is exempt from environmental noise provisions outlined by the WAC.

Existing Traffic Noise Conditions

Thirteen offsite receiver locations were selected to represent groupings of sensitive receivers that share common characteristics such as elevation, location in the study area, or land use (see **Figure 3.6-1**). Sound levels were measured at five representative offsite receiver locations and eight additional offsite receiver locations were modeled using a traffic noise model (TNM) to calibrate existing sound levels and to identify existing noise sources. Determination of the existing traffic conditions was based on PM peak hour traffic data presented in the *Transportation Discipline Report* (see **Appendix N**) prepared for this EIS. **Table 3.6-4** identifies each offsite receiver location with existing measured or modeled noise levels and a comparison of these levels to applicable traffic noise criteria. All receivers, with the exception of those currently located off the primary roadway network (identified as Receivers R7 and R8), currently experience noise levels at or above the FHWA/WSDOT noise impact criteria.

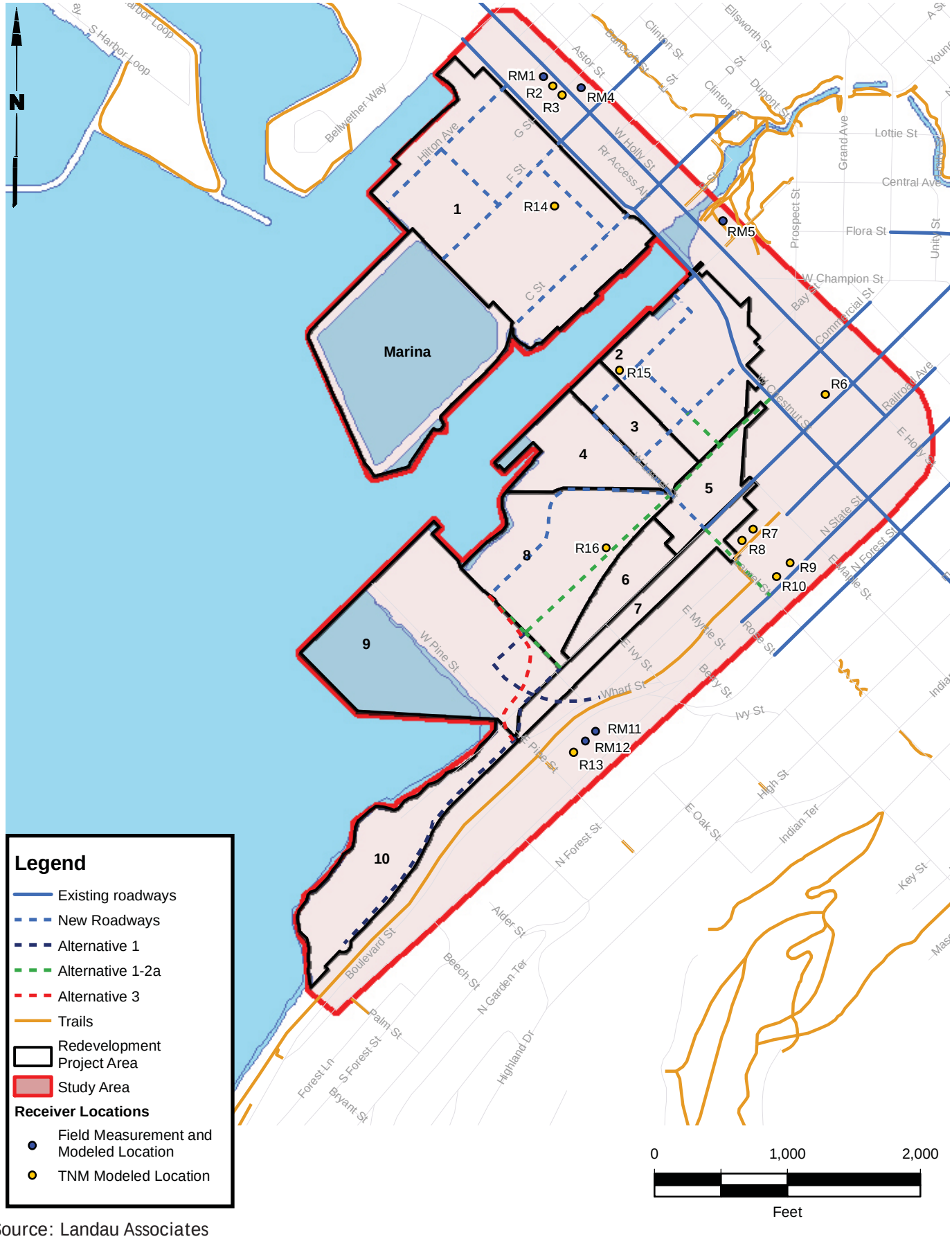
The measured and modeled existing traffic noise in the study area is consistent with typical urban, higher density environments. A number of conditions contribute to the noise levels in the study area, including the existing traffic volumes, frequency of signalized and stop-controlled intersections, proximity of receivers to the roadways (often less than 30 feet) and topography changes requiring vehicles to accelerate and decelerate with the change in elevation.

3.6.2 Impacts

Redevelopment of the site would result in the generation of noise during both construction and operational phases. Noise from the construction phase would be intermittent and would vary considerably depending on the specific nature of the construction, with some activities having a short duration and others a longer duration. This intermittent noise generation would occur over the assumed 20-year buildout period. Both construction and operational noise are considered below. The noise impact analysis methodology, including models and equipment used, are described in detail in **Appendix J**.

Construction

Alternatives 1 through 3 are expected to have some level of initial and ongoing phased construction as the area transitions from industrial land uses to a mixed use development. Each of the Alternatives would include similar construction activities such as clearing, grading, excavating, demolition, soil and material supply delivery, and heavy equipment use; therefore, construction activities and related noise levels would generally be the same for all



Source: Landau Associates

BLUMEN CONSULTING GROUP, INC	Figure 3.6-1 Noise Study Area and Receivers	New Whatcom Redevelopment EIS

Table 3.6-4
MEASURED AND MODELED EXISTING TRAFFIC NOISE LEVELS DURING THE PM PEAK HOUR (in dBA)

Representative Receiver Number	Description of Location	FHWA / WSDOT Traffic Noise Criteria	Field-Measured Noise Levels	TNM-Predicted 2007 Existing Conditions
RM1	Ground floor condominium along West Holly Street; frequent outdoor area faces Roeder Avenue	67	**72**	**71**
R2	Second floor condominium along West Holly Street; frequent outdoor area faces Roeder Avenue	67		**71**
R3	Third floor condominium along West Holly Street; frequent outdoor area faces Roeder Avenue	67		**71**
RM4	Residential home on north side of West Holly Street. Frequent outdoor area faces West Holly Street	67	**69**	67
RM5	Public Park, north side of West Holly Street	67	**69**	67
R6	Commercial District near intersection of West Holly Street and Cornwall Avenue	72		**71**
R7	Second floor residential condominium along Railroad Avenue; frequent outdoor area faces New Whatcom site	67		60
R8	Third floor residential condominium along Railroad Avenue; frequent outdoor area faces New Whatcom site	67		60
R9	Second floor residential condominium along North State Street; frequent outdoor area faces Cornwall Avenue	67		**71**
R10	Third floor residential condominium along North State Street; frequent outdoor area faces Cornwall Avenue	67		**70**
RM11	Ground floor condominium or home adjacent to Boulevard Street; frequent outdoor area faces New Whatcom site	67	**73**	**73**
RM12	Second floor condominium adjacent to Boulevard Street; frequent outdoor area faces New Whatcom site	67	**72**	**72**
R13	Third floor condominium adjacent to Boulevard Street; frequent outdoor area faces New Whatcom site	67		**72**

Source: Landau, 2007
RM # Field-measured and TNM-modeled receiver.
R # TNM-modeled receiver.
Bolded values indicate the FHWA/WSDOT noise abatement criteria have been exceeded.

Redevelopment Alternatives. Each of the alternatives includes a range of new infrastructure, roadway, in-water and recreational development which is assumed to be primarily completed by 2016. Although Alternative 1 is assumed to entail the largest level of infrastructure

improvements, construction activities involved in these improvements would be similar among the Redevelopment Alternatives.

Alternatives 1, 2 and 2A also include the relocation of a portion of the railroad corridor. If a plan to relocate the railroad corridor is pursued by BNSF/WSDOT in the future, this project would be subject to further environmental review and permitting requirements, possibly including noise impact analysis.

The noise levels generated by construction equipment activity during redevelopment of the New Whatcom site would vary depending on factors such as the type, model and condition of the equipment and the specific operation being performed. The average sound level of the construction activity would depend on the amount of time that the equipment operates and the intensity of construction activities during a given time period. Construction noise sources, such as heavy earth-moving equipment, would move from location to location and would be likely to vary in their intensity throughout a work day. Each construction project would require different types and scales of construction equipment at different locations within the site. Additionally, the specific timing of individual redevelopment projects and level of concurrent construction activity cannot be determined.

Standard construction equipment such as graders, scrapers, backhoes, loaders, cranes, dozers, water trucks, jackhammers, portable generators, air compressors, and miscellaneous trucks would be used during construction activities on the site. Specialized equipment, such as pile-drivers, would be used during construction of certain features such as support structures for buildings, parking facilities and bridge connections. The most prevalent noise sources during construction would be pile-driving and various engines that power equipment. At this time, the specific type of pile-driving, drilled or driven, has not been determined. Drilled piles are often perceived as quieter than driven piles. The construction process to drill piles results in constant steady noise emissions as a large auger advances in a slow drilling action through the ground. The construction process to drive piles creates sudden noise peaks as a pile is "hammered" into the ground. Also, noise emitted from the point of impact of driven piles is elevated more than 50 feet above the ground surface which may result in transmission of the noise to a greater (than with drilled piles) number of receivers within the area surrounding construction. The difference in the average Leq of the steady noise from drilled piles verses the repetitive noise peaks of driven piles is estimated at approximately 10 dBA.

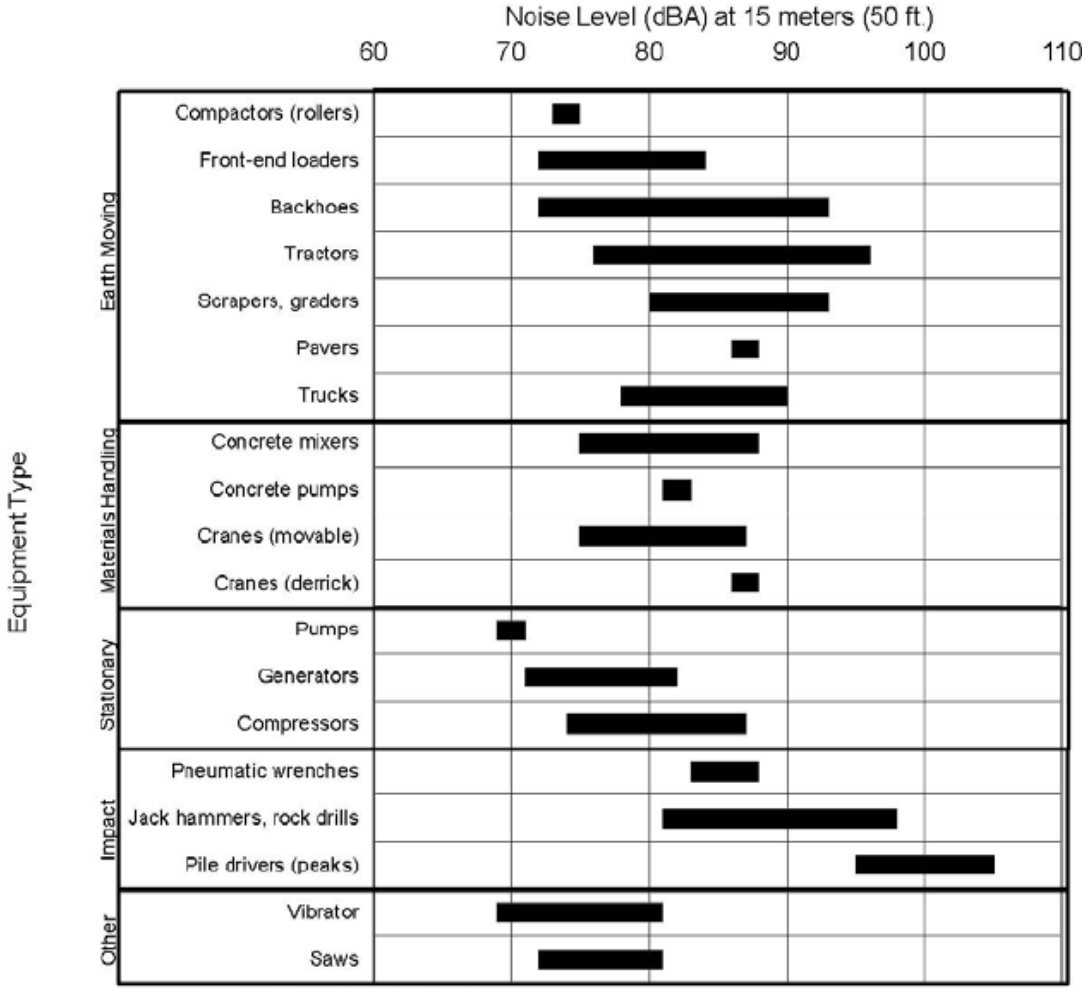
The maximum noise level ranges for various pieces of construction equipment at a distance of 50 feet are depicted in **Table 3.6-5** below. The maximum noise levels at 50 feet would range from approximately 65 to 106 dBA for the type of equipment normally used for this type of redevelopment project. Construction noise typically attenuates at approximately 6 dBA per doubling of the distance. Therefore, at a distance of 100 feet, the maximum levels would decrease by approximately 6 dBA relative to the levels identified in **Table 3.6-5**.

Existing sensitive receivers are generally located from 200 to more than 500 feet from the New Whatcom site (see **Figure 3.6-1**). New onsite receivers created as part of New Whatcom redevelopment could be in closer proximity to construction noise sources during certain phases of construction.

Although it is assumed that the construction efforts would be temporary and would not result in significant noise impacts, pile-driving is expected to affect the largest number of receivers on and surrounding the site. Pile-driving would be intermittently intrusive throughout the

construction period and could interfere with face-to-face or telephone conversations, disrupt day sleepers and disturb work that requires intense concentration at distances less than 500 feet from a particular construction area. As construction activities are assumed to be phased over the 20-year buildout period, pile-driving activities could also affect potential new on-site sensitive receivers located adjacent to areas under construction.

Table 3.6-5
TYPICAL CONSTRUCTION EQUIPMENT NOISE GENERATION LEVELS



Sources: EPA, 1971; WSDOT, 1991

Alternative 1 (Higher Density Alternative)

Alternative 1 assumes construction of the most extensive onsite infrastructure, roadway, and utility network, which would result in the greatest potential for construction-related noise impacts during the buildout period.

Noise resulting from construction activity would have a limited ability to significantly impact existing study area receivers located more than 500 feet from a given construction activity noise source. It is assumed that most construction activity would take place during daylight hours and

the resulting noise would fall to levels within 55 to 75 dBA at 500 feet from roadway or general building construction and would not, therefore, result in significant impacts.

Noise from impact-related construction activities, such as pile-driving, would likely be heard by receivers at a greater distance from the site and would be expected to be a nuisance for onsite and offsite receivers. As shown in **Table 3.6-5**, noise from pile-driving typically could reach 106 dBA at 50 feet. Using the construction noise attenuation factor of 6 dBA per doubling of the distance, noise from pile-driving may reach 86 to 88 dBA at 500 feet. Receivers at this distance, and receivers located closer than 500 feet, would experience substantial noise levels during intermittent pile-driving activities.

It is assumed that construction of the new roadway connections to the existing City street network at the perimeter of the site would pose the greatest potential for short-term construction impacts to existing offsite sensitive receivers, due solely to the proximity of sensitive receivers. These localized improvements would include:

- Improvements at Central Avenue to allow access to Chestnut Street (Area 2)
- New bridge connection at Bay Street (Area 2)
- New bridge connection at Commercial Street (Area 5)
- New bridge connections at Cornwall Avenue and Laurel Street (Area 7)
- New flyover at Wharf Street to provide connection to the intersection of North State Street and North Forest Street (Area 9).

However, as construction of roadway and infrastructure improvements, as well as building and parking construction, would be phased over time and would be temporary in nature, only short-term construction impacts would result and would not be expected to be significant. Further, specific design and engineering details of the bridge connections at Bay Street, Commercial Street, and Cornwall Avenue/Laurel Street and the Wharf Street Flyover have not been determined. If permit applications for these bridge connection improvements are submitted to the City at some future time, further environmental review, including potential noise analyses, would likely be required.

Alternatives 2 and 2A (Medium Density Alternative)

Alternatives 2 and 2A assume a medium range of density and a level of infrastructure, roadway and utility systems and amenities that would be slightly less than under Alternative 1. Alternatives 2 and 2A call for 6 million square feet of mixed-use redevelopment. Under Alternative 2, the Cornwall bridge connection and the Wharf Street flyover connection would not be completed, and under Alternative 2A, it is assumed that the railroad corridor would not be relocated until after 2016. The timing of certain other improvements is assumed to be different than under Alternative 2 as well.

Alternative 2 would have less short-term construction impacts relative to Alternative 1. Similar to Alternative 1, infrastructure and building projects would be phased over time and would be temporary in nature; therefore, such impacts would not be expected to be significant.

Alternative 3 (Lower Density Alternative)

Alternative 3 assumes the lowest level of density, infrastructure, and amenities. Many of the major infrastructure projects assumed to be completed under Alternatives 1 or 2, such as certain bridge connections and the Wharf Street Flyover, would not be completed under Alternative 3. Removing the construction activities associated with the bridge connections and the Wharf Street Flyover would also lessen the amount of construction activity in proximity to existing sensitive receivers in the east and south part of the study area. Additionally, under this alternative the railroad corridor would remain in its current alignment requiring less construction activity.

Alternative 3 is expected to have the fewest short-term construction impacts. Infrastructure and building construction would be phased over time and would be temporary in nature. Construction impacts would not be expected to be significant.

Operational

Non-Traffic Noise

Onsite Considerations

The Redevelopment and No Action Alternatives provide for a variety of uses onsite that are expected to contribute new sources of noise. These sources, such as general human activity, mechanical equipment associated with buildings, and light and marine industrial operations would be considered part of the ambient noise environment that is typical of an urban, waterfront community and would be expected to increase noise levels in the area.

Large marine vessel traffic in the Whatcom Waterway and the adjacent Bay, which also contributes to the existing background noise in the area, would be expected to decrease due to the reduction in industrial activities. However, an increase in small recreational vessel traffic associated with the marina, boat launch and temporary moorage facilities would occur. This shift in vessel use would not be expected to result in a net increase in perceptible noise levels from marine vessels at the site and in the site vicinity.

Other background noise sources, such as passenger and freight railroad operations, are expected to continue to contribute to the background noise within the study area. Officials at BNSF have indicated that rail industry traffic in the Bellingham area is forecasted to increase minimally by one to two round-trip trains per day over the foreseeable future (5 to 10 years) (Fishman, 2007).

Under Alternatives 1, 2 and 2A, a portion of the railroad corridor would move approximately 500 feet to the east and south. This relocation would position the railroad corridor adjacent to the bluff, similar to the current configuration near the north and south ends of the New Whatcom site. Alternatives 1 and 2 assume the relocation of the railroad corridor by 2016. Alternative 2A assumes the relocation of the railroad corridor by 2026. This relocation would serve to decrease noise to future onsite sensitive receivers by moving the noise source to a greater distance from new onsite uses (see further discussion of the railroad relocation under *Offsite Considerations* below).

The Redevelopment Alternatives assume a variety of noise-generating sources, such as light and marine industrial businesses, a new marina and ongoing operational activities at the Bellingham Shipping Terminal in the vicinity of areas that would also support office, institutional, recreational, and residential uses. Given the potential proximity of new onsite receivers to these noise sources, certain noise issues could arise among various uses. Although future building locations, specific land uses and specific noise-generating tenants have not been determined, site planning, design, building orientation and building techniques could be considered during the Master Development Plan and future permitting process to ensure that future onsite noise levels would adhere to Ecology's Environmental Noise Regulations. Further, noise-reducing strategies could be employed in locations where sensitive receivers could be sited in close proximity to potentially intrusive noise sources such as certain industrial uses, busy roadways, or the railroad corridor (see discussion of *Traffic Noise* below). A number of typical design and construction methods could be implemented to promote a long-term, noise-compatible mixed use neighborhood (see **Section 3.6.3, Mitigation Measures**, for a detailed list of these potential methods).

Offsite Considerations

Once construction is completed, future industrial, office, institutional, residential and recreational facilities assumed for the New Whatcom site, would be typical of an urban environment and would not be expected to significantly impact offsite sensitive receivers.

The noise from railway operations has been contributing to the background noise environment for all receivers in the study area. Effects resulting from the railway relocation would be varied depending on the specific offsite sensitive receiver's proximity and orientation to the railroad corridor. Because only a portion of the rail corridor would be relocated, it is expected that the perception of an increase in train noise would likely be limited to existing residences located in proximity to Areas 5 and 7. Relocating the rail corridor adjacent to the bluff would be expected to increase the noise for the first row of sensitive receivers positioned closest to the top of the bluff. Due to natural sound attenuation against steep terrain, the repositioning of the railroad next to the bluff could reduce the train noise levels at receivers beyond the first row of residences, farther to the east, northeast and southeast.

This analysis did not evaluate specific noise levels generated by the current or future railroad operations. It should be noted that the existing operation of the railroad corridor immediately adjacent to some of the receivers at the north and south ends of the site has not resulted in any reported noise concerns or known impacts. Further, railroad corridors are typically located within urban areas in direct proximity to sensitive receivers. Therefore, moving the railroad corridor to the eastern and southern portion of the site would not be anticipated to result in significant impacts. If specific plans to relocate the railroad corridor are pursued by BNSF/WSDOT in the future, the project would be subject to further environmental review and permitting requirements, potentially including noise impact analyses.

Traffic Noise

Following review of the traffic volume forecasts for each of the Redevelopment Alternatives (see the *Transportation Discipline Report* in **Appendix N** for details), two of the Redevelopment Alternatives were modeled for both 2016 and 2026. For purposes of this Draft EIS, Alternative 1, Alternative 3, and the No Action Alternative were modeled to provide a comprehensive overview of expected "worst-case" future traffic noise levels. Both onsite and offsite future traffic

noise were considered in this evaluation. Given that traffic volumes and associated noise related to Alternatives 2 and 2A would fall within the range of Alternatives 1 and 3, modeling of these Alternatives was not conducted.

Offsite Considerations

Results of the predicted future noise level modeling for existing and future onsite sensitive receivers are presented in **Table 3.6-6** below.

As shown in **Table 3.6-4**, based on PM peak hour traffic volumes, exterior noise levels at most receivers within the study area currently exceed the Noise Abatement Criteria (NAC). As indicated in **Table 3.6-6** with the exception of the first-row residential receivers located adjacent to Areas 5 and 7, and represented by R7 and R8, noise level increases at 2016 and 2026 would be generally limited to 1 to 2 dBA, with or without the New Whatcom mixed-use redevelopment (under the No Action Alternative).

Table 3.6-6
PREDICTED FUTURE TRAFFIC NOISE LEVELS DURING THE PM PEAK HOUR (in dBA)

			Alt 1		Alt 3		No Action	
Receiver	**Description**	**Existing**	**2016**	**2026**	**2016**	**2026**	**2016**	**2026**
RM1	Ground floor condominium along West Holly Street; frequent outdoor area faces Roeder Avenue	71	72	72	71	72	71	71
R2	Second floor condominium along West Holly Street; frequent outdoor area faces Roeder Avenue	71	71	72	72	72	71	71
R3	Third floor condominium along West Holly Street; frequent outdoor area faces Roeder Avenue	71	71	72	72	72	71	71
RM4	Residential home on north side of West Holly Street. Frequent outdoor area faces West Holly Street	67	68	69	68	69	68	69
RM5	Public Park, north side of West Holly Street	67	68	69	68	69	68	68
R6	Commercial District near intersection of West Holly Street and Cornwall Avenue	71	71	72	71	72	71	72

Table 3.6-6
(cont'd)

R7	Second floor residential condominium along Railroad Avenue; frequent outdoor area faces New Whatcom site	60	63	65	63	64	63	63
R8	Third floor residential condominium along Railroad Avenue; frequent outdoor area faces New Whatcom site	60	63	65	63	64	63	63
R9	Second floor residential condominium along North State Street; frequent outdoor area faces North State Street	71	70	70	70	70	70	70
R10	Third floor residential condominium along North State Street; frequent outdoor area faces North State Street	70	70	70	70	70	70	70
RM11	Ground floor condominium or home adjacent to Boulevard Street; frequent outdoor area faces New Whatcom site	73	73	74	73	73	73	73
RM12	Second floor condominium adjacent to Boulevard Street; frequent outdoor area faces New Whatcom site	72	72	74	72	72	72	72
R13	Third floor condominium adjacent to Boulevard Street; frequent outdoor area faces New Whatcom site	72	72	73	72	72	72	72
R14	Redevelopment Area 1	NA	70	70	69	70	69	69
R15	Redevelopment Area 2 and 3	NA	58	63	53	60	NA	NA
R16	Redevelopment Area 6 and 8	NA	60	66	60	61	NA	NA

Source: Landau Associates 2007
RM # Field-measured and TNM-modeled receiver
R # TNM-modeled receiver
NA = Not analyzed

This 1 to 2 dBA increase is predicted for the residential receivers at the north and south ends of the study area, at the existing park along West Holly Street and in proximity to commercial uses in the downtown area. Given that these exterior noise levels correspond to the PM peak hour (4:00 to 6:00 PM) traffic volumes, such levels should be considered "worst-case". Noise levels during other times of the day and night are, and would be, lower at all receivers.

The highest exterior noise level increases would result at receivers R7 and R8; such increases would range from a 3 to 6 dBA increase during the PM peak hour under all EIS Alternatives. These receivers represent higher-density residential uses located near Areas 5 and 7. These receivers are in closest proximity to the New Whatcom site and planned roadway connection improvements and redevelopment.

A 10-dBA increase above the existing noise environment is considered a "substantial increase", resulting in a significant impact. None of the receivers within the study area would be expected to experience substantial increases or significant impacts in relation to existing noise levels under any of the alternatives. With the exception of sensitive receivers in the vicinity of R7 and R8, worst-case noise increases would not be expected to be audible.

Because existing exterior noise levels at receivers within the study area surrounding the site are currently dominated by PM peak hour vehicular traffic on the immediately adjacent roadways (such as West Holly Street and North State Street) and exceed the NAC, mitigation for noise levels greater than the NAC would not be warranted for New Whatcom traffic.

Onsite Considerations

New receivers within the New Whatcom site were also considered in the traffic noise modeling effort for this Draft EIS. Because specific building locations and design features which could affect noise attenuation have not been determined, onsite receivers were assumed to be located at a distance of 50 feet from the busiest onsite roadways to characterize potential traffic noise levels within the site. These onsite receivers are shown on **Figure 3.6-1**. PM peak hour traffic volumes in 2016 and 2026 were modeled to represent a "worst-case" scenario.

With the exception of R14, onsite exterior noise levels would be generally expected to meet the NAC throughout the site in 2016 and 2026, primarily due to the lower volume of onsite vehicles as compared to the surrounding roadways. R14 represents potential sensitive receivers within Area 1. The predicted noise estimate for receiver R14 indicates a future noise level potentially exceeding the NAC for residential receivers, during the PM peak hours in both 2016 and 2026. However, this location is also subject to traffic noise along Roeder Avenue and the acceleration and deceleration of vehicle turning movements along that roadway. This worst-case noise prediction estimate provides useful data for the future siting and design of certain residential buildings at the New Whatcom site. Because traffic noise attenuates at 3 to 5 dBA with the doubling of distance from the source, specific siting of residential receivers at some distance (i.e. 100 feet) from the busiest roadway within the site could reduce noise levels 4 to 10 dBA from the predicted levels shown for receiver R14.

Alternative 1 (Higher Density Alternative)

Alternative 1 assumes the most intensive changes to the roadway infrastructure network. Improvements to Cornwall Avenue and the Laurel, Commercial and Bay Street bridge connections would increase the travel and distribution of traffic within the site and surrounding

area. Traffic within the new onsite roadway network would not be expected to pose significant impacts to existing sensitive receivers within the surrounding area due mainly to the distance between the onsite roadways and the existing receivers (more than 500 feet). Development of the onsite roadway network and related infrastructure under Alternative 1, and the operational impacts resulting from the assumed land uses redeveloped by 2016 or 2026, would provide for a relatively small contribution to the increase in exterior noise levels within the study area. Generally, traffic noise increases of 1 to 2 dBA would be expected during the PM peak hours; such increases would not be audible by residents within the study area. Slightly greater increases of 3 to 6 dBA would be expected near the new Laurel Street Bridge and improved Cornwall Avenue (near Areas 5 and 7 during the PM peak hours). Such increases would be expected to be audible, but would not be considered a significant impact.

One difference between Alternative 1 and Alternatives 2 and 3 is the assumed development of the Wharf Street/State Street Flyover and roundabout. Currently, these roadways operate as two intersections. The Wharf Street flyover improvement would create one intersection controlled by a roundabout, which could result in improved noise levels within the immediate vicinity by decreasing the number of vehicles that must come to a complete stop before accelerating through the area. Specific details of the Wharf Street Flyover have not been determined. If permit applications for this project are submitted in the future, additional environmental review, including potential noise analyses, would likely be required.

Although noise from traffic within the study area would be expected to increase under Alternative 1, the audible increases would be expected to be limited to those areas in close proximity to Areas 5 and 7. However, all existing receivers would not experience significant impacts due to traffic noise.

Alternative 2 (Medium Density Alternative)

As indicated above, Alternative 2 was not modeled relative to traffic noise; however, the traffic volumes of the higher-density alternative (Alternative 1) and the lower-density alternative (Alternative 3) were modeled. Predicted traffic noise levels for Alternatives 1 and 3 show that worst-case noise levels would be expected to be similar or less than a 1 dBA difference. The findings indicate that none of the Redevelopment Alternatives, including Alternatives 2 and 2A, would result in significant noise impacts.

Alternative 3 (Lower Density Alternative)

Because the differences in forecasted traffic volumes would be marginal from a noise standpoint, the expected traffic noise levels resulting from Alternative 3 would be similar to the predicted noise levels under Alternative 1 and the No Action Alternative.

The railroad corridor would not be assumed to be relocated under Alternative 3; therefore, background noise associated with relocating the railway operations closer to offsite receivers in Areas 5 and 7 would not increase. As with Alternative 1, no significant impacts would be anticipated.

No Action Alternative

The No Action Alternative assumes approximately 1.04 million square feet of new industrial uses and the reuse of 1.15 million square feet of existing industrial space on the New Whatcom

site. Limited infrastructure development would also occur, and it is assumed that no new public parks or amenities would be constructed, other than the marina.

Relative to the Redevelopment Alternatives, the No Action Alternative would have the least construction-related noise impacts.

Under the No Action Alternative, noise levels due to traffic during the PM peak hours would be similar to existing conditions (within 1 to 2 dBA) for receivers throughout the study area, except at receivers in proximity to Areas 5 and 7.

The assumed development of new industrial uses under the No Action Alternative has the potential to include additional stationary industrial noise sources on the site; however, it is assumed that each of the industrial operations would obtain and comply with all applicable environmental noise regulations. Therefore, no significant noise impacts to onsite or offsite receivers would be expected.

Indirect/Cumulative Impacts

New Whatcom redevelopment would be consistent with the City of Bellingham's plans to encourage future infill population and employment. Overall, there will be an increase in vehicular and truck traffic and commercial and industrial activities in the area over the next 20 years, and therefore, associated increases in noise levels, with or without New Whatcom redevelopment. Impacts related to growth, including the planned Bellwether on the Bay Phase II, the 1010 Morse Square and Bay View Tower projects, as well as the City's planned Overwater trail to Boulevard Park, would be expected to cumulatively add to the ambient noise environment in the area; noise levels would be typical of an urban community.

Construction of other residential, commercial, recreational and infrastructure projects in the site area that occur over the long-term would produce temporary noise impacts. Cumulative temporary noise impacts associated with construction activities would be intermittent, phased over time and would not be expected to be significant with implementation of typical construction noise mitigation measures, including compliance with City noise regulations.

A planned project that is separate from New Whatcom redevelopment, but within the site boundary (Redevelopment Area 9), is the construction of two new piers at the Bellingham Shipping Terminal. The new piers may potentially be utilized as a research docking facility for the National Oceanic and Atmospheric Administration (NOAA). As part of the operations of this docking facility, four home-ported vessels may be housed and serviced at the site. The noise generated by the additional NOAA vessel activity at the BST would be consistent with historic and current large vessel activity in Bellingham Bay. Assuming applicable construction and operational noise regulations are met in the future, significant cumulative impacts resulting from this project with or without New Whatcom redevelopment, would not be expected.

3.6.3 Mitigation Measures

Construction

Construction under the Redevelopment Alternatives is assumed to be phased over the buildout period. Phased construction would provide for intermittent construction activities that would

result in short-term noise increases. Although construction efforts would be considered short-term and are exempt from specific noise regulations and requirements, certain best management practices could be implemented to reduce the potential for impacts to onsite and nearby sensitive receivers.

Construction industry best management practices related to noise mitigation could be incorporated into future construction plans and contractor specifications.

The redevelopment could also include the following construction noise mitigation measures as feasible:

- Limit construction activities during weekends to comply with the City of Bellingham noise regulations (BMC 10.24.120) and restrict construction noise to the hours between 7:00 AM and 10:00 PM.

- Explore the feasibility of using less noisy construction options to pile-driving. For example, predrilling a pile hole using an auger to place the pile at or near its design depth (drilled piles) would reduce noise levels by 5 to 10 dBA. In addition, limits on specific construction times could be designated for pile-driving activities.

- Equip the engines of construction equipment with adequate mufflers, intake silencers, or engine enclosures that would reduce their noise by 5 to 10 dBA (EPA, 1971).

- Turn off construction equipment when not in use for long periods.

- Require contractors to maintain equipment and train equipment operators to reduce noise levels.

- Locate stationary equipment away from receiving properties to decrease noise, when feasible.

Operation

Traffic noise level impacts on offsite receivers were evaluated on a worst-case basis (i.e. PM peak hour traffic volumes with New Whatcom redevelopment were used to predict worst-case noise levels at sensitive receiver locations in the study area); based on the analysis in this Draft EIS, significant traffic noise impacts would not result. Based on WSDOT's Noise Abatement Criteria (NAC), noise abatement measures could be considered if future noise levels could approach or exceed NAC levels for New Whatcom improvements that involve construction of new roadways, altering the horizontal or vertical alignment of an existing roadway or adding through lanes to an existing roadway. Specific project details regarding bridge connections and the Wharf Street Flyover have not been determined. If permit applications for these roadway and bridge connection projects are pursued in the future, further environmental review, including potential noise analyses, would likely be required. Other offsite roadway improvements are not assumed as part of the Redevelopment Alternatives (such improvements would likely be required as mitigation for transportation impacts; see Section 3.12, **Transportation**, for more information on transportation mitigation measures).

Future traffic and operational noise level impacts on the site were also assessed on a worst-case basis. Worst-case noise levels at one onsite receiver in Area 1 could exceed NAC levels for residential receivers. Design and construction methods to achieve noise attenuation could be considered as part of the future permit process for redevelopment in portions of the site. Such methods could reduce the potential for onsite noise levels that could be above the NAC or the Environmental Noise Regulations at certain locations for new onsite residential receivers. These design and construction methods could include any or all of the following:

- Specific acoustical site planning that considers the arrangement of buildings to minimize the potential for noise impacts. This could include siting residential units at some distance from busy roadways or other noise-generating sources, or closer to quieter and less traveled onsite roadways, planned parks and greenspaces.

- Acoustical noise-reducing concepts could be incorporated in the architectural design of individual buildings. These concepts could include room arrangement, window placement, and balcony and courtyard design. For example, placing bedrooms and living rooms in the part of the residential building farthest from the noise source, while placing kitchens and bathrooms closer to the noise source.

- Acoustical construction treatments could be used for various parts of residential buildings to reduce interior noise impacts. Treatments could include the use of walls, windows, doors, ceilings, and floors that have been treated to reduce sound transmission into a building (the use of dense materials and the use of airspaces within materials are the principal noise-reduction techniques of acoustical construction).

- Non-living portions of residential buildings (such as garages, commercial spaces, and recreational facilities) could be placed between the residences and roadways or other noise-generating sources, such as industrial operations or the railroad to reduce noise levels to residential receivers.

3.6.4 Significant Unavoidable Adverse Impact

No significant noise impacts from either construction or operation under the EIS Alternatives would result.