NOISE ANALYTICAL REPORT

Everett Park District Redevelopment Project
Everett, Washington

September 29, 2023

Prepared for

Everett Housing Authority
and
EA Engineering, Science, and Technology, Inc.
Noise Analytical Report
Everett Park District Redevelopment Project - Everett, Washington

This document was prepared by, or under the direct supervision of, the technical professionals noted below.

Document prepared by:    Amy Maule
Primary Author

Document reviewed by:    Kristen Wallace
Quality Reviewer

Date:         September 29, 2023
Project No.:  2169001.010
File path:    P:\2169\001\R
Project Coordinator:  Christopher C. Young
TABLE OF CONTENTS

List of Abbreviations and Acronyms ............................................................................................................ iv
1.0 Introduction ................................................................................................................................... 1-1
2.0 Characteristics of Sound and Noise ............................................................................................... 2-1
3.0 Regulatory Framework ................................................................................................................... 3-1
  3.1 Traffic Noise................................................................................................................................ 3-2
4.0 Existing Noise Environment ........................................................................................................... 4-1
  4.1 Land Use and Zoning .................................................................................................................. 4-1
  4.2 Existing Traffic .......................................................................................................................... 4-1
  4.3 Baseline Sound Level Measurements ..................................................................................... 4-1
    4.3.1 Long-Term Sound Level Measurements ............................................................................ 4-2
    4.3.2 Short-Term Sound Level Measurements ............................................................................ 4-2
5.0 Impacts ........................................................................................................................................... 5-1
  5.1 Temporary Construction Noise .............................................................................................. 5-1
  5.2 Operational Noise .................................................................................................................... 5-1
    5.2.1 Alternative 1 ..................................................................................................................... 5-1
    5.2.2 Alternative 2 ..................................................................................................................... 5-2
    5.2.3 No Action Alternative 3 .................................................................................................... 5-2
  5.3 Local Roadway Noise .............................................................................................................. 5-2
    5.3.1 Traffic Modeling Methods .................................................................................................. 5-3
6.0 Mitigation Measures ....................................................................................................................... 6-1
  6.1 Construction and Demolition .................................................................................................... 6-1
  6.2 Operation ................................................................................................................................... 6-1
7.0 Significant Unavoidable Adverse Impacts ...................................................................................... 7-1
8.0 Use of This Report .......................................................................................................................... 8-1
9.0 References ..................................................................................................................................... 9-1

FIGURE

<table>
<thead>
<tr>
<th>Figure</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Project Site and Sound Level Measurement Locations</td>
</tr>
</tbody>
</table>

TABLES

<table>
<thead>
<tr>
<th>Table</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>Table 1: Common Sources of Noise</td>
<td>........................................................................................................ 2-1</td>
</tr>
<tr>
<td>Table 2: Maximum Permissible Noise Levels</td>
<td>........................................................................................................ 3-1</td>
</tr>
<tr>
<td>Table 3: Long-Term Sound Level Measurements</td>
<td>........................................................................................................ 4-2</td>
</tr>
<tr>
<td>Table 4: Short-Term Sound Level Measurements</td>
<td>........................................................................................................ 4-2</td>
</tr>
<tr>
<td>Table 5: Weekday Peak-Hour Automobile and Heavy Truck Traffic Volumes in Project Vicinity</td>
<td>........................................................................................................ 5-3</td>
</tr>
<tr>
<td>Table 6: Estimated Traffic-Related Noise Levels</td>
<td>........................................................................................................ 5-5</td>
</tr>
</tbody>
</table>
LIST OF ABBREVIATIONS AND ACRONYMS

A3 ...................................................................................................................... A3 Acoustics
dBA ................................................................................................................. A-weighted decibels
EMC ............................................................................................................. Everett Municipal Code
FHWA ............................................................ Federal Highway Administration
Landau .............................................................. Landau Associates, Inc.
Leq ................................................................................................................. equivalent sound level
Lmax ............................................................................................................. maximum noise level
mph ................................................................................................................ miles per hour
NAC ............................................................................................................. noise abatement criteria
WSDOT .......................................................... Washington State Department of Transportation
1.0 INTRODUCTION

At the request of the Everett Housing Authority, Landau Associates, Inc. under contract with EA Engineering, Science, and Technology, Inc. prepared this noise analytical report to support the Environmental Impact Statement for the proposed Everett Park District Redevelopment Project.

The following sections describe the existing conditions and current regulatory environment of the study area, which is defined as the approximately 16-acre project site, adjacent and nearby noise-sensitive receiver locations (land used for purposes sensitive to noise, such as residences), and existing residential land uses (Figure 1) and potential noise increases associated with the project Alternative 1, Alternative 2, and No Action Alternative 3.
2.0 CHARACTERISTICS OF SOUND AND NOISE

For the purposes of this analysis, noise can be described as sound that is undesired, in terms of its loudness (amplitude) and frequency (pitch). Magnitudes of typical noise levels are presented below.

Table 1: Common Sources of Noise

<table>
<thead>
<tr>
<th>Noise Source</th>
<th>Decibel Level</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jet takeoff at 50 feet</td>
<td>140</td>
<td>Physical pain and immediate injury</td>
</tr>
<tr>
<td>Chain saw, siren at close range</td>
<td>120</td>
<td>Uncomfortably loud</td>
</tr>
<tr>
<td>Loud entertainment venue</td>
<td>105-110</td>
<td></td>
</tr>
<tr>
<td>Motorcycle at 50 feet</td>
<td>95</td>
<td>Very loud</td>
</tr>
<tr>
<td>Noisy urban street</td>
<td>85</td>
<td></td>
</tr>
<tr>
<td>Washing machine or dishwasher</td>
<td>70</td>
<td>Possible annoyance</td>
</tr>
<tr>
<td>Range of normal human speech</td>
<td>50-70</td>
<td></td>
</tr>
<tr>
<td>Average office</td>
<td>50</td>
<td>Quiet</td>
</tr>
<tr>
<td>Refrigerator hum</td>
<td>40</td>
<td></td>
</tr>
<tr>
<td>Whisper, ticking watch</td>
<td>20-30</td>
<td>Barely audible</td>
</tr>
</tbody>
</table>

Sources: HUD 2009; CDC 2019

Since the human ear is not equally sensitive to sound at all frequencies, a frequency-dependent rating relates noise to human hearing sensitivity. This is called the A-weighted decibel (dBA) scale. This scale accounts for the human perception of a doubling of loudness as an increase of 10 dBA. Therefore, a 70-dBA sound level will sound twice as loud as a 60-dBA sound level. People generally cannot detect differences of 1 to 2 dBA between noise sources of a similar nature (e.g., an increase in traffic noise compared to existing traffic noise); however, under ideal listening conditions, differences of 2 or 3 dBA can be detected by some people. Most people under normal listening conditions would probably perceive a 5-dBA change in noise of a similar nature. However, if an intruding noise is of a different nature than background noise (e.g., backup alarms in a quiet neighborhood), many people can perceive the intruding noise even if it increases the overall dBA noise level by less than 1 dBA.

A measure used to represent the average sound energy occurring over a specified time period is the equivalent sound level (Leq). Leq is the steady-state sound level that would have the same acoustical energy as the time-varying sound that actually occurs during the monitoring period. The 1-hour A-weighted equivalent sound level (Leq 1 h) is the energy average of A-weighted sound levels occurring during a 1-hour period.

When distance is the only factor considered, sound levels from isolated point sources of noise typically decrease by about 6 dBA for every doubling of distance from the noise source. When the noise source is a continuous line, sound levels decrease by about 3 dBA for every doubling of distance. Attenuation of noise at a distance is also affected by the type of intervening ground, with hard/reflective surfaces (e.g.,...
pavement, water) resulting in less attenuation at a distance and soft/absorbent surfaces (e.g., vegetation, fluffy snow), resulting in greater attenuation.

Noise levels at different distances can also be affected by several factors other than the distance from the noise source. Topographic features and structural barriers that absorb, reflect, or scatter sound waves can affect the decreasing noise levels. Atmospheric conditions (wind speed and direction, humidity levels, and temperatures) can also affect the degree to which sound is attenuated over distance.

Echoes off topographical features or buildings can sometimes result in higher sound levels (lower sound attenuation rates) than normally expected. Temperature inversions and altitudinal changes in wind conditions can also refract and focus sound waves toward a location at considerable distance from the noise source. As a result, the existing noise environment can be highly variable depending on local conditions.
3.0 REGULATORY FRAMEWORK

The project site is located in north Everett, Snohomish County, and is subject to the noise regulations established by the Everett Municipal Code (EMC). EMC Chapter 20.08 specifies noise limits based on the noise control district of the noise source and receiving property. Section 20.08.020 identifies District I as residentially zoned districts, District II as business and commercially zoned districts, and District III as agricultural and manufacturing zoned districts and other non-residential, non-business and non-commercially zoned districts. The maximum permissible noise levels, established in EMC 20.08.040, are shown in Table 2.

<table>
<thead>
<tr>
<th>Table 2: Maximum Permissible Noise Levels</th>
</tr>
</thead>
<tbody>
<tr>
<td>District of Sound Source</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>--------------------------</td>
</tr>
<tr>
<td>I</td>
</tr>
<tr>
<td>II</td>
</tr>
<tr>
<td>III</td>
</tr>
</tbody>
</table>

Between the hours of 10 PM and 7 AM during weekdays, and between the hours of 10 PM and 9 AM on weekends (nighttime hours), the levels in Table 2 are reduced by 10 dBA for any receiving property within District I.

At any hour of the day or night, for any source of sound that is of short duration, the levels established by this chapter are increased by:

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

These allowed sound level exceedances can be described in terms of the percentage of time a certain level is exceeded, using statistical noise descriptors (Lₙ,s). For example, L25 represents a sound level that is exceeded 25 percent of the time, or 15 minutes in an hour. The maximum permissible noise levels identified in Table 2 are represented by the L25. Similarly, L8.33 and L2.5 are the sound levels that are exceeded 8.33 and 2.5 percent of the time, or 5 and 1.5 minutes in an hour, respectively. At no time can the allowable sound level be exceeded by more than 15 dBA, represented by the Lmax (maximum noise level).

Noise originating from temporary construction sites and received in a District I property is exempt from the noise limits described above between 7 AM and 10 PM on weekdays and between 8 AM and 6 PM on weekends and holidays. When that noise is received in a District II or III property, the exemption applies between 7 AM and 10 PM on weekdays and 9 AM and 10 PM on weekends and holidays (EMC 20.08.100).
EMC 20.08.150 allows the City to issue variances in cases where exceedance of the thresholds cannot be avoided.

### 3.1 Traffic Noise

Noise from vehicles operating on public highways is exempt from the limits identified in Table 2. Noise emitted from individual vehicles is subject to vehicle-specific noise limits established in EMC 20.08.060 and 20.08.070 and to restrictions regarding alterations, mufflers and exhaust systems, and driving activities that cause vehicles to exceed noise thresholds established in EMC 20.08.080.

Although Everett has no noise limits applicable to general traffic noise on public roadways, the Federal Highway Administration (FHWA) Noise Abatement Criteria (NAC), and Washington State Department of Transportation’s (WSDOT’s) implementation of these criteria provide a means to consider traffic noise. The FHWA NAC are not applicable to this project because no FHWA project or funding is proposed; however, they are presented here as quantitative noise thresholds for evaluating the impacts of traffic noise on receivers within the study area.

The NAC identify noise levels for various land-use categories to determine whether traffic noise impacts occur. The NAC for residential areas, schools, active sport areas, parks, and trails is a level “approaching or exceeding” 67 dBA at exterior use locations, and WSDOT defines a peak-hour traffic noise level impact criterion of 66 dBA. Consistent with the NAC, WSDOT defines a traffic noise impact as either of the following:

- Peak-hour traffic noise level of 66 dBA (Leq) or greater at the exterior outdoor use area of any existing or future dwelling
- Increase in peak-hour traffic noise of 10 dBA Leq or greater (future project level minus existing level) at the exterior outdoor use area of any existing dwelling (considered a “substantial increase”).
4.0 EXISTING NOISE ENVIRONMENT

The project site is located within the city limits of Everett. Surrounding land uses, zoning, and existing noise sources in the study area are described below.

4.1 Land Use and Zoning

The project site and land immediately to the north and south are zoned Urban Residential 3. Land to the east and west of the project site is zoned Single Family Detached Medium Density. Land adjacent to the northwest of the project site is zoned Urban Residential 4. All zoning within the study area is considered District I, as described in Section 3.1.2.

The comprehensive plan designation for the project site and land to the north and south is “Multifamily.” Property to the east and west of the project site is designated “Single Family,” with the exception of the property between 13th and 14th Streets, east of Pine Street, which is designated “Multifamily.”

Hawthorne Elementary School and the Everett Boys and Girls Club are located northwest of the project site. Wiggums Hollow Park is located north of the project site. The Baker Community Center is located southwest of the project site. All other land adjacent to the project site is developed with residences.

4.2 Existing Traffic

The project site is bounded by 12th Street to the north and 14th Street to the south, though the easternmost portion of the project extends south of 14th Street to 15th Street. The project extends from just beyond Poplar Street on the west to just beyond Fir Street on the east.

Based on a transportation study conducted by Heffron Transportation, Inc. (Heffron 2023), through streets within approximately 500 feet of the project site are two-lane streets with speed limits between 20 and 30 miles per hour (mph). Peak hour traffic volumes range from approximately 50 to 200 vehicles per hour.

Broadway (approximately 1,500 feet west of the project site) and East Marine View Drive (approximately 650 feet east of the project site) are each major arterials with posted speed limits of 35 mph and 30 mph, respectively, and peak-hour traffic ranging from approximately 1,000 to 2,000 vehicles per hour.

A quantitative traffic noise analysis comparing noise associated with Build and No-Build traffic volumes is provided in Section 3.1.4.

4.3 Baseline Sound Level Measurements

A noise study was conducted by A3 Acoustics (A3) in 2020 for the Baker Heights (now known as Madrona Square) project, immediately adjacent to the southern boundary of the Parks District Redevelopment Project. For the noise study, A3 conducted baseline noise monitoring within the Baker Heights/Madrona Square project area located at 1401 Poplar Street and 1402 to 1410 Larch Street.
(A3 2020). Traffic volumes during April 2020 would have been lower than typical due to COVID-19 restrictions in place at the time; however, the noise environment at Baker Heights/Madrona Square is comparable to that of the Park District project area.

### 4.3.1 Long-Term Sound Level Measurements

Three long-term measurements were taken on the Park District and adjacent Madrona Square site using sound level meters mounted on the roofs of existing structures at the locations shown on Figure 1. Noise was measured for 120 hours between April 4 and April 8, 2020, and the resulting measured levels are summarized in Table 3.

<table>
<thead>
<tr>
<th>Monitoring Location</th>
<th>Leq, dBA</th>
<th>Lmax, dBA</th>
<th>Lmax Noise Sources</th>
</tr>
</thead>
<tbody>
<tr>
<td>NAL-1</td>
<td>43-57</td>
<td>53-79</td>
<td>Train traffic, motorcycles, trucks, aircraft, gunshots</td>
</tr>
<tr>
<td>NAL-2</td>
<td>44-59</td>
<td>56-83</td>
<td>Train traffic, motorcycles and trucks, aircraft, gunshots, power saw</td>
</tr>
<tr>
<td>NAL-3</td>
<td>43-59</td>
<td>53-84</td>
<td>Train traffic, motorcycles and cars, aircraft, birds</td>
</tr>
</tbody>
</table>

Source: A3 2020.

A3 reported that the dominant noise source was observed to be road traffic from passenger and delivery vehicles. Additional noise sources were reported to include train horns and small-propeller aircraft flyovers.

### 4.3.2 Short-Term Sound Level Measurements

Five short-term sound level measurements were taken in April 2020 at the Madrona Square site, at the locations shown on Figure 1. The measured short-term sound levels are shown in Table 4.

<table>
<thead>
<tr>
<th>Measurement Location</th>
<th>Leq, dBA</th>
<th>Lmax, dBA</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Location A</td>
<td>41</td>
<td>60</td>
<td>Minimal residential automobile traffic; birds chirping; distant freeway noise audible</td>
</tr>
<tr>
<td>Location B</td>
<td>53</td>
<td>76</td>
<td>Limited residential automobile traffic; one distant propeller plane</td>
</tr>
<tr>
<td>Location C</td>
<td>44</td>
<td>62</td>
<td>Limited residential automobile traffic; pedestrians passing by; neighbors talking/noise in the distance</td>
</tr>
<tr>
<td>Location D</td>
<td>48</td>
<td>73</td>
<td>Light rain; birds; a distant plane; limited residential automobile traffic; a loud motorcycle passing by (73 dBA Lmax)</td>
</tr>
<tr>
<td>Location E</td>
<td>42</td>
<td>51</td>
<td>Light rain; automobile traffic in distance</td>
</tr>
</tbody>
</table>

Source: A3 2020.
5.0 IMPACTS

Noise impacts of Alternatives 1, 2 and No Action Alternative 3 were qualitatively addressed for the following elements: temporary construction noise and long-term (operational) noise from residential development, parks/recreation uses, and commercial uses. Noise associated with vehicular traffic on existing roadways and planned project roadways was quantitatively addressed using a screening-level study.

5.1 Temporary Construction Noise

Under all alternatives (including the No Action Alternative), existing buildings will be demolished, clearing and grading will take place, and new infrastructure will be constructed. The phasing of the three alternatives is expected to be similar; however, the No Action Alternative could be completed earlier than Alternatives 1 and 2 because fewer buildings would be built.

Demolition of existing structures, clearing and grading activities, and construction of new infrastructure and housing are accompanied by temporary increases in noise due to the use of heavy equipment and hauling of construction materials. Noise impacts depend on the background sound levels, the type of construction equipment being used, and the amount of time it is in use.

As noted in Section 3.1.2, noise originating from temporary construction sites and received in a District I (residential) property is exempt from the noise limits described above between 7 AM and 10 PM on weekdays and between 8 AM and 6 PM on weekends and holidays. When that noise is received in a District II or III property, the exemption applies between 7 AM and 10 PM on weekdays and 9 AM and 10 PM on weekends and holidays (EMC 20.08.100).

Construction noise may have a temporary, localized impact on nearby residences, businesses, schools, and parks. However, due to the temporary nature of the noise and the restriction of construction activities to daytime hours, any impacts are expected to be less than significant.

5.2 Operational Noise

For each alternative, on-site noise sources are discussed qualitatively below. Noise associated with off-site traffic was quantitatively addressed using a screening-level study.

5.2.1 Alternative 1

Alternative 1 includes a Planned Development Overlay to allow for inclusion of mixed uses, including multi-family residential, retail, civic/service, office, and outdoor use areas. The project area is currently zoned Urban Residential 3, which does not allow mixed-use development.

Noise sources associated with residential and outdoor uses include human voices and activity and maintenance work. Although the residential development would be denser under Alternative 1 than past residential uses on the site, the types and overall levels of noise would be similar to levels produced with past uses, controlled by the residential zoning noise limits applied to the site, consistent with the current zoning, and any resulting noise impacts would be less than significant.
In addition to the residential and outdoor uses, Alternative 1 includes an approximately 1.5-acre park. Similar to residential uses, public parks can produce noise associated with maintenance activities and human voices and activity. Noises associated with neighborhood parks would be similar to noise produced at the Everett Boys and Girls Club, west of the project site, and Wiggums Hollow Park, north of the project site, which are considered consistent with and appropriate for residential land uses, and any noise impacts would be less than significant.

Alternative 1 also includes non-residential uses, such as retail, civic/service and office, similar to small businesses and offices already present in the vicinity (e.g., the Baker Community Center, Everett Housing Authority offices, and Ron’s Market on 16th Street and Baker Avenue). Noise sources associated with such uses generally include a greater amount of vehicle traffic (employees, customers, and delivery truck traffic), discussed separately below, in addition to mechanical equipment (such as commercial boilers and heating units). Although specific non-residential uses are not currently identified, any non-residential uses are expected to be small and intended to complement residential development. Such uses are highly localized and subject to the noise limits described in Section 3.1.2. The EMC defines noise control districts based on the zoning of the noise source and receiving properties. Because the project area and adjacent properties will still be zoned for residential use with the Planned Development Overlay, the District I noise limits (55 dBA during daytime hours and 45 dBA during nighttime hours) would be applicable to any non-residential use in the project area, which would minimize any potential for significant noise impacts from such uses. Depending on the commercial uses planned, a focused noise study may be required to ensure that all activities and equipment on the site demonstrate compliance with the local noise limits.

5.2.2 Alternative 2

Alternative 2 is similar to Alternative 1, with the same number of residences and the same amount of non-residential development. However, the 1.5-acre park would not be included in Alternative 2. All other operational noises would be similar to Alternative 1. Therefore, noise impacts associated with Alternative 2 would not be considered significant.

5.2.3 No Action Alternative 3

The No Action Alternative 3 includes fewer multi-family residences, no public park, and no non-residential uses. Operational noise associated with Alternative 3 would be similar to residential noise expected with Alternatives 1 and 2; however, less noise would be expected due to a lower density of residential units. Noise impacts associated with Alternative 3 would not be considered significant.

5.3 Local Roadway Noise

Alternatives 1 and 2 would result in increased traffic on local roadways, within and around the project site. Residential traffic on local roads would include residents and visitors entering, leaving, and traveling within the project site. Under Alternatives 1 and 2, traffic would also be associated with non-residential uses, including employees, customers, and delivery and service vehicles entering, leaving, and traveling within the project area.
Use of federal funds for roadway or intersection improvements would trigger the WSDOT requirement to model traffic noise impacts and evaluate traffic noise abatement, and to present the results of the noise abatement analysis in National Environmental Policy Act environmental documentation for any roadway projects. However, no federal funds are currently anticipated for roadway/intersection improvements for the proposed project.

### 5.3.1 Traffic Modeling Methods

For this assessment, potential traffic noise impacts caused by increased traffic from the project on the following road segments (shown on Figure 1), were evaluated for existing homes and noise-sensitive receivers:

- 12<sup>th</sup> Street between N Broadway Avenue and Poplar Street;
- 12<sup>th</sup> Street between Fir Street and E Marine View Drive;
- Baker Avenue between 15<sup>th</sup> Street and 16<sup>th</sup> Street;
- Pine Street south of 15<sup>th</sup> Street;
- 16<sup>th</sup> Street between N Broadway Avenue and Baker Avenue; and
- 16<sup>th</sup> Street between Walnut Street and Baker Avenue.

Peak-hour (weekdays between 4:00 and 5:00 pm) traffic volumes along these streets in the project vicinity, projected for each of the action alternatives and for the No Action Alternative, are listed in Table 5. Peak-hour traffic volume forecasts were provided by Heffron Transportation Inc. Heavy truck volume was estimated to be 5 percent of total traffic volume (Heffron 2023).

#### Table 5: Weekday Peak-Hour Automobile and Heavy Truck Traffic Volumes in Project Vicinity

<table>
<thead>
<tr>
<th>Road Segment Description</th>
<th>Alternative 1 and Alternative 2 – 2035</th>
<th>No Action (2035)</th>
</tr>
</thead>
<tbody>
<tr>
<td>12&lt;sup&gt;th&lt;/sup&gt; Street between N Broadway Avenue and Poplar Street</td>
<td>431 (23)</td>
<td>271 (14)</td>
</tr>
<tr>
<td>12&lt;sup&gt;th&lt;/sup&gt; Street between E Marine View Drive and Fir Street</td>
<td>359 (19)</td>
<td>195 (10)</td>
</tr>
<tr>
<td>Baker Avenue between 16&lt;sup&gt;th&lt;/sup&gt; Street and 15&lt;sup&gt;th&lt;/sup&gt; Street</td>
<td>126 (7)</td>
<td>60 (3)</td>
</tr>
<tr>
<td>Pine Street, south of 15&lt;sup&gt;th&lt;/sup&gt; Street</td>
<td>190 (10)</td>
<td>9 (0)</td>
</tr>
<tr>
<td>16&lt;sup&gt;th&lt;/sup&gt; Street between Broadway Avenue and Baker Avenue</td>
<td>633 (33)</td>
<td>661 (35)</td>
</tr>
<tr>
<td>16&lt;sup&gt;th&lt;/sup&gt; Street between Walnut Street and Baker Avenue</td>
<td>539 (28)</td>
<td>634 (33)</td>
</tr>
</tbody>
</table>

Source: Heffron 2023

The FHWA Traffic Noise Model Version 3.1 (FHWA 2021) was used to predict existing and future noise levels during peak hours under the screening-level assumptions listed below. The model was configured as follows for the roads listed above:

- No field measurements were collected for this screening-level noise study.
It was assumed that all receivers have a direct line-of-sight to impacted roadways; barrier analysis was not conducted.

Traffic was assumed to travel at 25 miles per hour on all roadways (Heffron 2023).

The ground surface type was conservatively defined as “hard soil.”

All receiver locations were modeled at a distance of 25 feet from the nearest edge of the roadway, unless otherwise noted.

The roadway lane width was assumed to equal 12 feet and all traffic was conservatively assumed to be traveling on the lane nearest the receiver.

Traffic forecasts for the 2035 No Action Alternative were estimated by Heffron using a 1.0 percent compound annual growth rate applied to existing traffic volumes (Heffron 2023).

Traffic forecasts for Alternatives 1 and 2 were assumed to be identical (Heffron 2023).

The higher traffic volume, which occurred during evening peak-hours, was used for analysis.

All roads were modeled as straight lines; the model was not configured to account for existing or proposed topography, roadway improvements, or configuration changes resulting from the project.

Table 6 lists the modeled daytime Leq noise levels at each representative receiver location for Alternatives 1 and 2, and the No Action Alternative 3. The difference between traffic-related noise levels for Alternatives 1 and 2 and the No Action Alternative is also shown.

As discussed in Section 3.1.2, the FHWA NAC are not applicable to this project; however, they are useful as quantitative noise thresholds for evaluating the impacts of traffic noise on receivers within the study area. The modeled peak-hour traffic noise increase at full buildout would not meet or exceed the WSDOT peak-hour traffic noise level impact criterion of 66 dBA at any location.

The modeled peak-hour traffic noise for the No Action Alternative 3 along Pine Street, south of 15th Street, was unrealistically low (41 dBA) due to the low volume of traffic on that segment. Screening-level traffic models do not include noise from other nearby roadways or other background noise sources. The average measured sound level at NAL-1 between 4:00 PM and 5:00 PM over 5 days was 52 dBA (A3 2020), which was used as a more realistic No Action Alternative noise level at that intersection.

The modeled noise level for Alternatives 1 and 2 at this location is 59 dBA, which is well below the noise level impact criterion of 66 dBA. Additionally, the modeled noise level is within 2 dBA of the range of long-term Leq measurements at location NAL-1 (43 to 57 dBA) and represents a 6-dBA increase over the short-term measured Leq at Location B of 53 dBA (see Tables 3, 4, and Figure 1).

Modeled peak-hour traffic volumes occur during daytime hours, when higher noise levels are expected and generally less obtrusive. Traffic volumes during nighttime hours, when people are more sensitive to noise, would be lower than the traffic volumes modeled, resulting in lower noise levels.
Table 6: Estimated Traffic-Related Noise Levels

<table>
<thead>
<tr>
<th>Road Segment Description</th>
<th>Alternative 1 &amp; Alternative 2 (2035)</th>
<th>No Action Alternative 3 (2035)</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>12th Street between N Broadway Avenue and Poplar Street</td>
<td>62</td>
<td>58</td>
<td>4</td>
</tr>
<tr>
<td>12th Street between E Marine View Drive and Fir Street</td>
<td>62</td>
<td>59</td>
<td>3</td>
</tr>
<tr>
<td>Baker Avenue between 16th Street and 15th Street</td>
<td>57</td>
<td>54</td>
<td>3</td>
</tr>
<tr>
<td>Pine Street, south of 15th Street</td>
<td>59</td>
<td>52 (41)</td>
<td>7</td>
</tr>
<tr>
<td>16th Street between Broadway Avenue and Baker Avenue</td>
<td>64</td>
<td>64</td>
<td>0</td>
</tr>
<tr>
<td>16th Street between Walnut Street and Baker Avenue</td>
<td>63</td>
<td>64</td>
<td>-1</td>
</tr>
</tbody>
</table>

a. 52 dBA is the average measured sound level at NAL-1 between 4:00 PM and 5:00 PM over 5 days. 41 dBA represents the modeled traffic noise at this location, which does not include noise from other roadways or other background noise sources.

Because modeled traffic noise levels for Alternatives 1, 2, and 3 are below the noise level impact criterion of 66 dBA for all modeled road segments, noise impacts would not be considered significant.
6.0 MITIGATION MEASURES

The following mitigation measures are proposed to address the potential noise from construction and operation of the project under all alternatives.

6.1 Construction and Demolition

Construction noise could be reduced by using enclosures or walls to surround noisy stationary equipment, installing mufflers on engines, substituting quieter equipment or construction methods, minimizing time of operation, and locating equipment as far as practicable from sensitive receivers. To reduce construction noise at nearby receivers, the following mitigation measures could be incorporated into construction plans and contractor specifications:

- Locate stationary equipment away from receiving properties
- Erect portable noise barriers around loud stationary equipment located near sensitive receivers
- Turn off idling construction equipment
- Require contractors to rigorously maintain all equipment
- Train construction crews to avoid unnecessarily loud actions (e.g., dropping bundles of rebar onto the ground or dragging steel plates across pavement) near noise-sensitive areas.

Local regulations require limiting construction activities to between the hours 7 AM and 10 PM on weekdays and between 8 AM and 6 PM on weekends and holidays when noise is received in a District I property, or between 7 AM and 10 PM on weekdays and 9 AM and 10 PM on weekends and holidays when that noise is received in a District II or III property.

6.2 Operation

Most noise sources related to operation would be relatively insignificant and typical and appropriate of residential communities.

Noise associated with vehicle traffic is positively correlated with vehicle speed. Roadway design and traffic calming measures within the project site and on approaching roadways could reduce vehicle speed and associated noise.

Some non-residential uses associated with commercial or civic uses may introduce mechanical equipment that could potentially exceed local noise limits. Such uses may require a focused noise study to ensure that all activities and equipment on the site demonstrate compliance with the local noise limits, thereby minimizing the potential for significant noise impacts.
7.0 SIGNIFICANT UNAVOIDABLE ADVERSE IMPACTS

Compared to pre-development noise levels, noise levels will likely increase in the study area under all alternatives from short-term clearing/grading, demolition, and construction noise and long-term traffic and human noise sources. However, the impact of noise from residential development and non-residential uses is expected to be minimal and no significant impacts are expected.
8.0 USE OF THIS REPORT

This noise analytical report has been prepared for the exclusive use of the Everett Housing Authority, under contract with EA Engineering, Science, and Technology, Inc., in support of the Environmental Impact Statement for the proposed Everett Park District Redevelopment project. No other party is entitled to rely on the information, conclusions, and recommendations included in this document without the express written consent of Landau. Further, the reuse of information, conclusions, and recommendations provided herein for extensions of the project or for any other project, without review and authorization by Landau, shall be at the user’s sole risk. Landau warrants that within the limitations of scope, schedule, and budget, our services have been provided in a manner consistent with that level of care and skill ordinarily exercised by members of the profession currently practicing in the same locality under similar conditions as this project. Landau makes no other warranty, either express or implied.
9.0 REFERENCES


Base Map Source: Esri World Imagery, 2023; Sound Level Measurement Source: A3 Acoustics, 2020

Legend
- Sound Level Measurement Location
- Modeled Roadway Segments
- Project Site

Note
1. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.