Noise and Vibration Supplemental Memorandum

Multnomah County | Earthquake Ready Burnside Bridge Project

Portland, OR

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Earthquake Ready Burnside Bridge Noise and Vibration Supplemental Memorandum

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Acronyms, Initialisms, and Abbreviations

ADA	Americans with Disabilities Act
API	Area of Potential Impact
CSZ	Cascadia Subduction Zone
dB	decibel
dBA	A-weighted decibel
EIS	Environmental Impact Statement
EQRB	Earthquake Ready Burnside Bridge
I-5	Interstate 5
Leq	equivalent sound level
Leq(h)	hourly equivalent sound level
NAAC	Noise Abatement Approach Criteria
NAC	Noise Abatement Criteria
ODOT	Oregon Department of Transportation
SDEIS	Supplemental Draft Environmental Impact Statement
TNM	Traffic Noise Model

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Executive Summary

The Earthquake Ready Burnside Bridge Project (EQRB) proposes to rebuild or replace the Burnside Bridge with an earthquake resistant structure that can withstand a major Cascadia Subduction Zone (CSZ) earthquake. In support of a Supplemental Draft Environmental Impact Statement (SDEIS) pursuant to the National Environmental Policy Act, noise and vibration levels associated with the construction and operation of Project's Refined Long-span Alternative.

Long-term direct impacts associated with the Refined Long-span Alternative would be similar to those of the No Build Alternative because the alignment of the bridge would be similar and accompanying traffic would be the same. Under the Refined Long-span Alternative 2045 conditions, predicted exterior traffic noise levels would range from 59 dBA Leq(h) to 75 dBA Leq(h) and would exceed the Noise Abatement Approach Criteria (NAAC) at 262 NAAC B uses (residences), and 8 NAAC C uses across the Tom McCall Waterfront Park (3 seating areas or locations with information plaques) and Vera Katz Eastbank Esplanade (5 benches). Relative to the No Build and Draft EIS Long-span Alternatives there would be five less residential impacts under the Refined Long-span Alternative. The range of sound levels would be the same relative to the No Build and Draft EIS Long-span Alternatives. For receptors where there is no exterior use, such as at places of worship and the University of Oregon, interior noise levels would range from 40 dBA Leq(h) to 43 dBA Leq(h) with none of these locations exceeding the NAAC. These results are the same as those for the No Build and Draft EIS Long-span Alternatives.

Build Alternatives noise impacts were evaluated for noise abatement in the form of noise walls on the Burnside Bridge. Noise walls were found to be infeasible because they would not reduce traffic noise levels by at least 5 dB at over 50 percent of impacted receptors. The reason for insufficient noise reduction is because traffic noise would predominantly be from I-5, a roadway that would not be altered as part of EQRB or shielded by noise walls on Burnside Bridge.

Construction noise and vibration impacts would be similar to those in the Draft EIS and may result from EQRB; implementing the 2021 Oregon Department of Transportation (ODOT)'s standard construction specifications and other mitigation measures would reduce and/or eliminate some of the impacts. Additionally, EQRB's construction contractor will be required to obtain a City of Portland noise variance permit, which will place further restrictions on EQRB noise to protect the surrounding community. Finally, vibration from construction activities would be kept below the impact thresholds identified in this report by using alternate construction methods, monitoring vibration levels when construction has the potential to damage structures, and/or by using hand tools where necessary.

The Project Area does not contain undeveloped land; however, Category E and F land uses that do not have exterior uses could change with future development. Predicted sound levels for the portions of these areas closest to the dominant noise source (i.e., Naito Parkway or I-5) were calculated for the Draft EIS and would be the same for the SDEIS worst noise hour at 64 dBA Leq(h) for areas along Naito Parkway at a distance of

18 feet, and 74 dBA Leq(h) along I-5 at a distance of 105 feet. This information, along with a copy of this memorandum, will be sent to the City of Portland Planning Department and ODOT and will serve to inform local governments of the effects of the proposed Project on local noise levels.

1 Introduction

In support of the Supplemental Draft Environmental Impact Statement (SDEIS) for the Earthquake Ready Burnside Bridge (EQRB) Project, this supplemental technical memorandum has been prepared to evaluate the impacts of potential design refinements to the Preferred Alternative on noise and vibration within the project's Area of Potential Impact (API). The intent of the design modifications is to reduce the overall cost and improve the affordability of the EQRB Project. This technical memorandum is a supplement to the Draft EIS technical reports and as such does not repeat all of the information in those reports, but instead focuses on the impacts of the design modification options, how they compare to each other, and how they compare to the version of the Preferred Alternative that was evaluated in the EQRB Draft Environmental Impact Statement (Multnomah County 2021b).

Much of the information included in the Draft EIS and Draft EIS technical reports, including project purpose, relevant regulations, analysis methodology and affected environment, is incorporated by reference because it has not changed, except where noted in this technical memorandum.

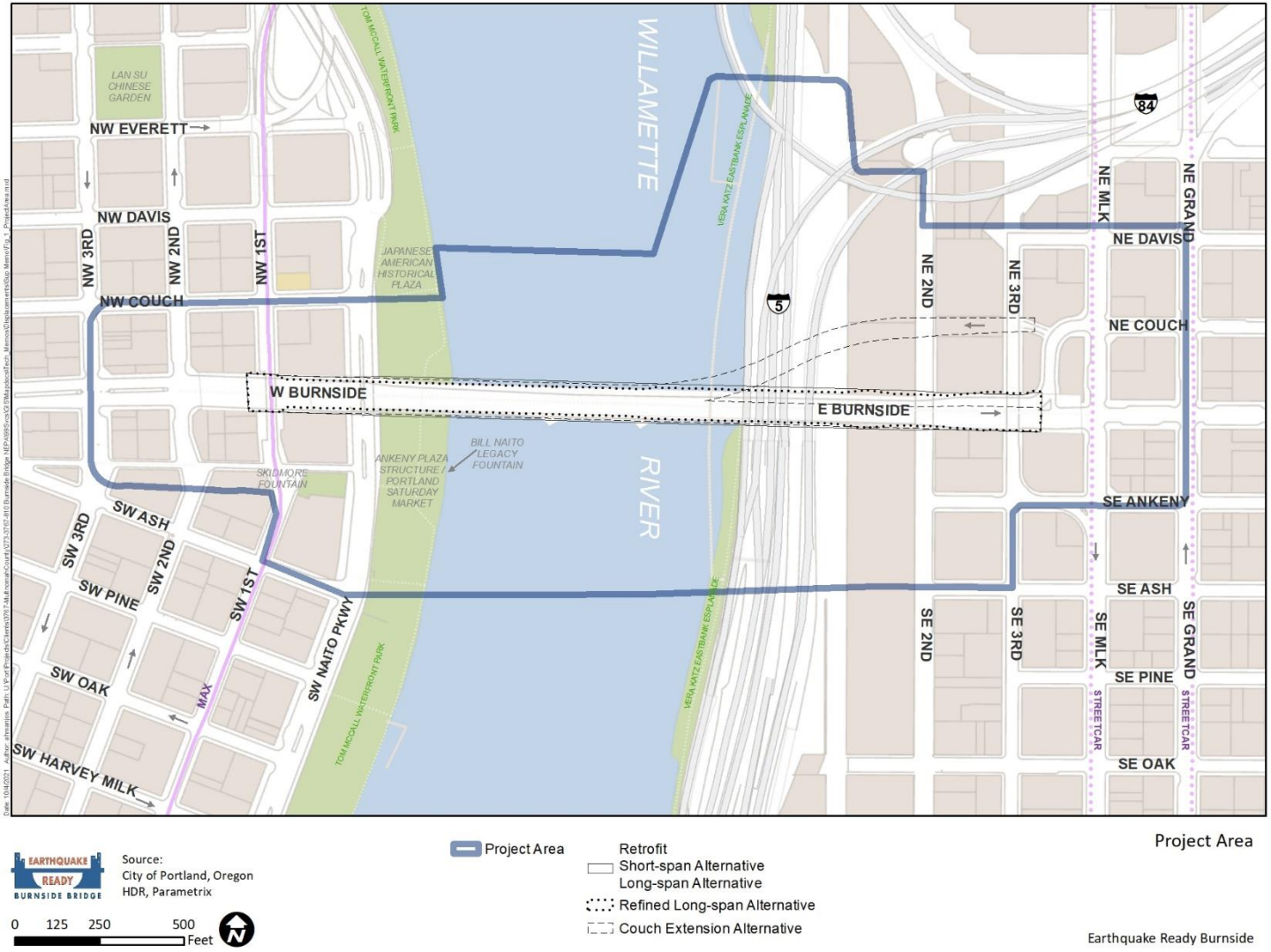
1.1 Project Location

The Project Area is located within the central city of Portland. The Burnside Bridge crosses the Willamette River connecting the west and east sides of the city. The Project Area encompasses a one-block radius around the existing Burnside Bridge and W/E Burnside Street, from NW/SW 3rd Avenue on the west side of the river and NE/SE Grand Avenue on the east side. Several neighborhoods surround the area including Old Town/Chinatown, Downtown, Kerns, and Buckman. Figure 1 shows the Project Area.

1.2 Project Purpose

The primary purpose of the Project is to build a seismically resilient Burnside Street lifeline crossing over the Willamette River that will remain fully operational and accessible for vehicles and other modes of transportation following a major Cascadia Subduction Zone (CSZ) earthquake. The Burnside Bridge will provide a reliable crossing for emergency response, evacuation, and economic recovery after an earthquake. Additionally, the bridge will provide a long-term safe crossing with low-maintenance needs.

Figure 1. Project Area



2 Project Alternatives

This technical memorandum evaluates potential design refinements to the Draft EIS Preferred Alternative. All of the Project Alternatives evaluated in the Draft EIS are summarized in Chapter 2 of the Draft EIS and described in detail in the *EQRB Description of Alternatives Report* (Multnomah County 2021a). Briefly, the Draft EIS evaluated a No-Build Alternative and four Build Alternatives. One of the Build Alternatives, the Long-span Alternative, was identified as the Preferred Alternative. The potential refinements evaluated in this technical memorandum are collectively referred to as the Refined Long-span Alternative (Four-lane Version) or the Refined Long-span. The Refined Long-span includes Project elements that were studied in the Draft EIS but have been modified as well as new options that were not studied in the Draft EIS. These refinements and new options are intended to provide lower cost and, in some cases, lower impact designs and ideas that could be adopted to reduce the cost of the Draft EIS Preferred Alternative while still achieving seismic resiliency. The potential design refinements, and how they differ from the Draft EIS Long-span Alternative, are described below.

- Bridge width – The total width of the bridge over the river would be approximately 82 to 93 feet (the range varies depending on the bridge type and segment). For comparison, the Draft EIS Replacement Alternatives were approximately 110 to 120 feet wide over the river. The refined bridge width would accommodate approximately 78 feet for vehicle lanes, bike lanes, and pedestrians, which is comparable to the existing bridge.
    - The refined bridge design would accommodate four vehicle lanes (rather than five as evaluated in the Draft EIS). The following lane configuration options are being evaluated:
        - Lane Option 1 (Balanced) – Two westbound lanes (general-purpose) plus two eastbound lanes (one general-purpose and one bus-only lane)
        - Lane Option 2 (Eastbound Focus) – One westbound lane (general-purpose) plus three eastbound lanes (two general purpose and one bus only)
        - Lane Option 3 (Reversible Lane) – One westbound lane (general-purpose) plus two eastbound lanes (one general-purpose and one bus-only) plus one reversible lane (westbound AM peak and eastbound PM peak)
        - Lane Option 4 (General Purpose with Bus Priority) – Two westbound general-purpose lanes plus two eastbound general-purpose lanes, plus bus priority access (e.g., queue bypass) at each end of the bridge.
    - The width of the vehicle lanes would be, at minimum, 10 feet and could vary depending on how the total bridge width is allocated between the different modes.
    - The total width of the bicycle lanes and pedestrian sidewalks would be approximately 28 to 34 feet. This is wider than the existing bridge but narrower than what was proposed in the Draft EIS for the replacement alternatives.

Physical barriers between vehicle lanes and the bicycle lanes are proposed and are in addition to the above dimensions.

  - The refined bridge would allow narrower in-water piers, due to less weight needing to be transferred to the in-water supports.

- Other design refinements being evaluated:
  - West approach – This memorandum evaluates a refined girder bridge type for the approach over the west channel of the river, Tom McCall Waterfront Park, and Naito Parkway. Compared to the cable-stayed and tied-arch options evaluated in the Draft EIS, this option would not only reduce costs but also avoid an adverse effect to the Skidmore/Old Town National Historic Landmark District. It would have two sets of columns in Tom McCall Waterfront Park compared to just one with the Draft EIS tied-arch option and five with the existing bridge.

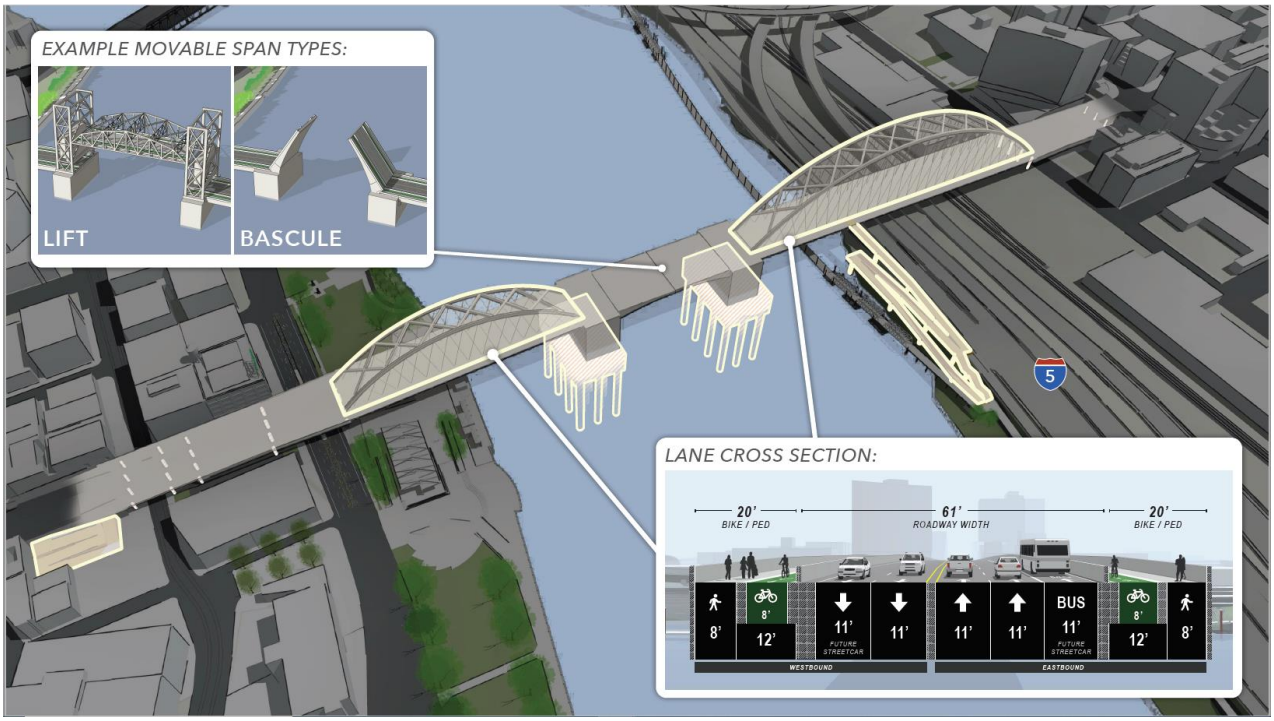
  - East approach – This memorandum evaluates a potential span length change for the east approach tied-arch option that would minimize the risks and reduce costs associated with placing a pier and foundation in the geologic hazard zone that extends from the river to about E 2nd Avenue. The refined tied-arch option would be about 720 to 820 feet long and approximately 150 feet tall (the Draft EIS Long-span Alternative was the same height and 740 feet long). The refined alternative would place the eastern pier of the tied-arch span either on the east side of 2nd Avenue (Option 1) or just west of 2nd Avenue (Option 2). Increasing the length of the tied-arch span would also reduce the length and depth of the subsequent girder span to the east.

  - Americans with Disabilities Act (ADA) access – This memorandum evaluates a refined approach for providing direct ADA access between the bridge and the Eastbank Esplanade, as well as between the bridge and W 1st Avenue and the Skidmore Fountain MAX station. The Draft EIS evaluated multiple ramp, stair, and elevator options for these locations. This SDEIS memo evaluates a refined option that would provide enhanced ADA access at both locations using both elevators and stairs. These facilities would also provide pedestrian and potentially bicycle access. For the west end, there is also the potential for replacing the existing stairs with improved sidewalk access from the west end of the bridge to 1st Avenue.

Figure 3 highlights the elements of the Draft EIS Long-span Alternative that have been modified to create the Refined Long-span Alternative, as described above. Figure 2 shows the Draft EIS Long-span Alternative and Figure 3 shows the Refined Long-span Alternative. Both figures include the tied-arch option for the east approach and the bascule option for the center movable span, but the east span could also be a cable-stayed bridge and the movable span could be a vertical lift bridge. For the west approach, the Draft EIS Long-span Alternative shows the tied-arch option while the Refined Long-span Alternative shows the refined girder bridge. The Refined Long-span Alternative image shows just one of the four possible lane configuration options being studied. All four configuration options, as well as many more graphics of the Refined Long-span Alternative, and how it compares to the Draft EIS Long-span Alternative, can be found in Chapter 2 of the *EQRB Supplemental Draft Environmental Impact Statement*

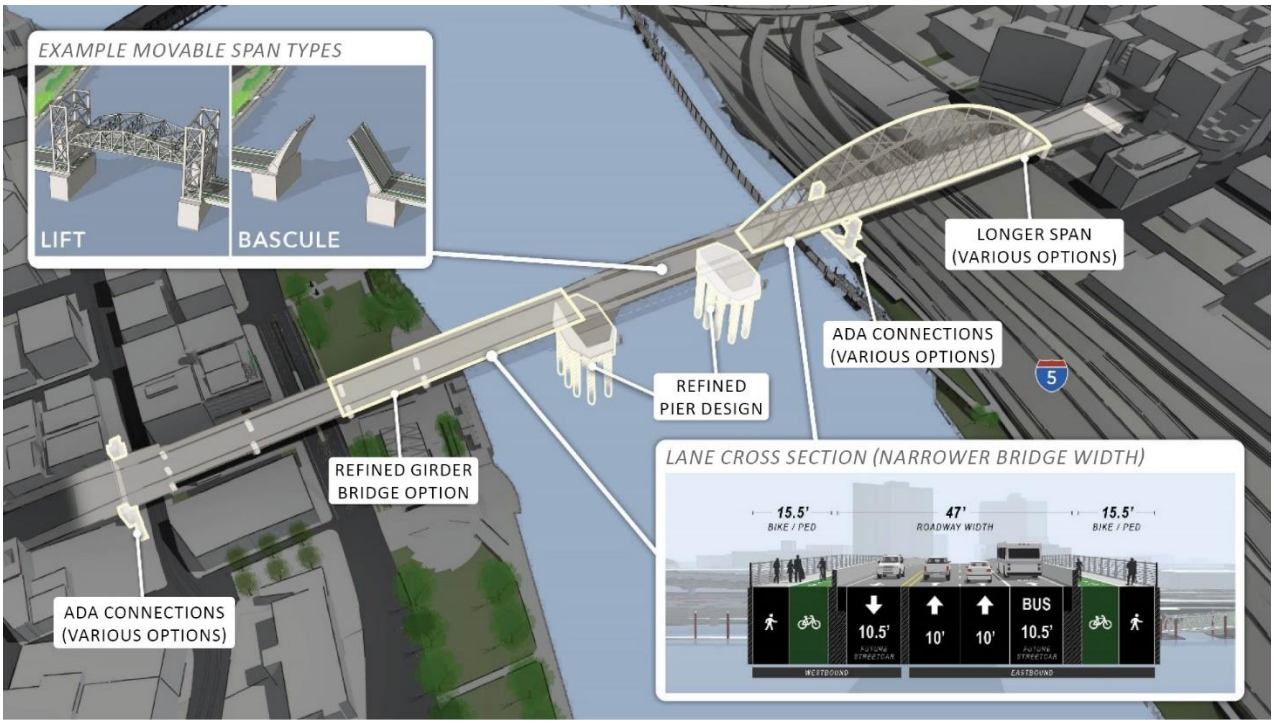
(Multnomah County 2022a). Figure 3 also shows just one of the possible ways to allocate the bridge width between vehicle lanes, bicycle lanes and sidewalks; the total width of the bicycle and pedestrian facilities could range from approximately 28 to 34 feet.

Figure 2. Draft EIS Long-Span Alternative



Note: The Draft EIS Long-span Alternative included multiple bridge types for both the east and west approach. This figure shows only the tied arch option.

Figure 3. Refined Long-Span Alternative



Notes: The Refined Long-span Alternative evaluated in this SDEIS includes both cable-stayed and tied arch options for the east span. This figure shows only the tied arch option. The Draft EIS studied, and SDEIS further studies, a bascule option and vertical lift option for the center movable span. The inset shows both options but the main figure shows the bascule option. This figure also shows just one of the lane configuration options considered in the SDEIS.

- Construction assumptions:
  - Construction duration – The expected duration of project construction is 4.5 to 5.5 years, dependent upon the design option. See Table 1 for more information regarding construction impact extent and closure timeframes.
  - Construction area – Compared to the Draft EIS Long-span Alternative, the main refinement is that the construction area would be smaller for the west approach south of the bridge, including a smaller area within Tom McCall Waterfront Park south of the bridge.
  - Construction access and staging – The construction access and staging is expected to be the same as that described in the Draft EIS.
  - Vegetation – The Refined Long-span Alternative would remove slightly fewer trees and vegetation impacts than the Draft EIS Long-span Alternative, primarily within Tom McCall Waterfront Park south of the bridge.
  - In-water work activity – The in-water work would be similar to that described in the Draft EIS, except that the replacement bridge in-water foundations would consist of a perched footing cap and a group of drilled shafts. Whereas the Draft EIS discussed the use of cofferdams to isolate in-water work, the Refined Long-span Alternative proposes to use a temporary caisson lowered to an elevation about mid-height of the water column to construct footing caps, avoiding additional disturbance of the riverbed that would be needed for a cofferdam.

Additionally, the existing Pier 4 would be fully removed, Pier 1 would be partially removed below the mudline and Piers 2 and 3 removed to below the mudline. Existing in-water piles would be removed, subject to the design option advanced.

- Temporary freeway, rail, street, and trail closures – Temporary closures are expected to be the same as those described in the Draft EIS.
- Access for pedestrians and vehicles to businesses, residences, and public services – Access is expected to be the same as that described in the Draft EIS.
- On-street parking impacts – On-street parking impacts are expected to be the same as those described in the Draft EIS.
- Property acquisitions and relocations – Property acquisitions and relocations are similar to those listed in the Draft EIS, except that they have been modified to reflect a narrower set of bridge design options.
- Temporary use of Governor Tom McCall Waterfront Park – The park area that would be temporarily closed for construction has changed since the DEIS. On the north side of the bridge, the closure area has been reduced to avoid removing ten cherry trees and a berm that are part of the Japanese American Historical Plaza; this change would apply to all of the build alternatives. On the south side of the bridge, the park closure area has also been reduced to include only the area north of the Tom McCall Waterfront Park trellis; this revision applies only to the Refined Long-span Alternative.

Table 1. Construction Impacts, Closure Extents, and Timeframes by Build Alternative

Facility Impacted	Draft EIS Long-Span Alternative	Refined Long-Span Alternative
Tom McCall Waterfront Park	4.5-year closure within boundary of potential construction impacts	Same; Smaller closure area south of the bridge
Willamette River Greenway Trail	Portion of trail within Tom McCall Waterfront Park closed for same duration as park; detours in place for construction duration	Same
Japanese American Historical Plaza	Southern portion of plaza would be closed for same duration as Tom McCall Waterfront Park	Same
Ankeny Plaza Structure	Closure for duration of construction but no impacts to Ankeny Plaza structure	Plaza Structure would not be closed during construction or impacted
Bill Naito Legacy Fountain	No closure of fountain and associated hardscape	Same
Vera Katz Eastbank Esplanade	18 months (this could extend to 3.5 to 4.5 years if project builds ramps rather than elevators and stairs for the ADA/bicycle/pedestrian connection); detours in place for construction duration	Same
Burnside Skatepark	4-month full closure	Same
River Crossing on Burnside Street	4- to 5-year closure	Same

Facility Impacted	Draft EIS Long-Span Alternative	Refined Long-Span Alternative
Saturday Market Location	4.5-year closure or use of alternative location	Same
Skidmore Fountain MAX Station	Approximately 5 weeks	Same
Navigation Channel/Willamette River Water Trail	Intermittent closures; 2 to 10 closures; each closure up to 3 weeks	Same
Overall Construction Duration	**4.5 to 5.5 years**	**Same**

3 Definitions

The following terminology is used when discussing geographic areas in the EIS:

- **Project Area** – The area within which improvements associated with the Project Alternatives would occur and the area needed to construct these improvements. The Project Area includes the area needed to construct all permanent infrastructure, including adjacent parcels where modifications are required for associated work such as utility realignments or upgrades. For the EQRB Project, the Project Area includes approximately a one-block radius around the existing Burnside Bridge and W/E Burnside Street, from NW/SW 3rd Avenue on the west side of the river and NE/SE Grand Avenue on the east side.
- **Area of Potential Impact (API)** – This is the geographic boundary within which physical impacts to the environment could occur with the Project Alternatives. The API is resource-specific and differs depending on the environmental topic being addressed. For all topics, the API will encompass the Project Area, and for some topics, the geographic extent of the API will be the same as that for the Project Area; for other topics (such as for transportation effects) the API will be substantially larger to account for impacts that could occur outside of the Project Area. The same API was used in the SDEIS as was used in the *EQRB Noise and Vibration Technical Report* (Multnomah County 2021c).

Project vicinity – The environs surrounding the Project Area. The project vicinity does not have a distinct geographic boundary but is used in general discussion to denote the larger area, inclusive of the Old Town/Chinatown, Downtown, Kerns, and Buckman neighborhoods.

4 Relevant Regulations

There are no differences in regulations with the Refined Long-span Alternative.

5 Analysis Methodology

The analysis methodology is the same as was used in the *EQRB Noise and Vibration Technical Report* (Multnomah County 2021c). Operationally Options 2 and 3 would result in the highest traffic volumes and were used in this analysis. The traffic volumes for Options 2 and 3 are the same.

6 Affected Environment

The affected environment for the Refined Long-span Alternative is the same as was included in the *EQRB Noise and Vibration Technical Report* (Multnomah County 2021c).

7 Impacts from the Design Modifications and Comparison to Draft EIS Alternatives

7.1.1 Direct Impacts of the No Build Alternative

As described in the *EQRB Draft Transportation Supplemental Memorandum* (Multnomah County 2022b) slight changes in traffic volumes were identified relative to the volumes documented in the Draft EIS. On Burnside Street in the noise API, traffic would decrease by 0.1 percent relative to what was analyzed for the No-Build Alternative (and the Long-span Alternative) in the Draft EIS. On the other streets included in the noise analysis, traffic volumes would decrease by 0.2 percent on average relative to what was analyzed in the Draft EIS. The changes in traffic volumes represent an insignificant change to traffic noise of less than 0.01 dB; therefore, the analysis of No-Build and other alternatives using the same traffic assumptions remains consistent with what was analyzed in the Draft EIS.

7.1.2 Direct Impacts of the Refined Long-span Alternative

Construction of the Refined Long-span Alternative (4-lane version) would last 4.5 years or 5.5 years depending on design options selected. Construction noise and vibration impacts would be the same as those identified for the Draft EIS Long-span Alternative in the *EQRB Noise and Vibration Technical Report* (Multnomah County 2021c).

Long-term Direct Impacts

Long-term direct impacts associated with the Refined Long-span Alternative would be similar to those of the No-Build Alternative because the alignment of the bridge would be similar and accompanying traffic would be the same. Appendix A includes the electronic Traffic Noise Model (TNM) files for the Refined Long-span Alternative 2045 conditions. The 2045 traffic noise levels are provided in Appendix B and Figure 4 and Figure 5 show the location of each receptor listed in Table B-1 of Appendix B. Appendix C provides the traffic data used in the noise analysis. Under the Refined Long-span Alternative 2045 conditions, predicted exterior traffic noise levels would range from 59 dBA Leq(h) to 75 dBA Leq(h) and would exceed the Noise Abatement Approach Criteria (NAAC) at 262

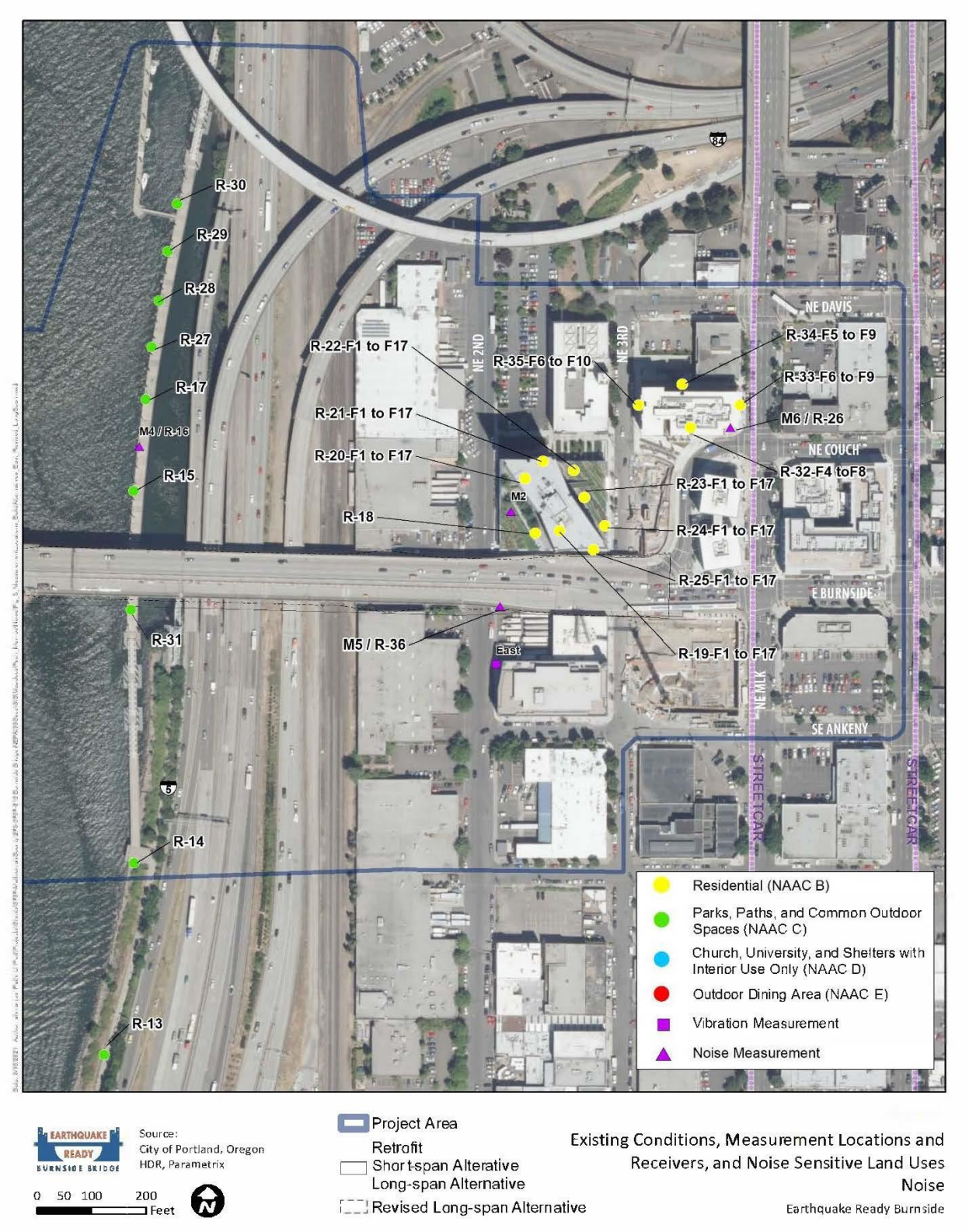
NAAC B uses (residences), and 6 NAAC C uses across the Tom McCall Waterfront Park (3 seating areas or locations with information plaques) and Vera Katz Eastbank Esplanade (3 benches). Relative to the No Build and Draft EIS Long-span Alternatives there would be five less residential and two less NAAC C impacts under the Refined Long-span Alternative. The range of sound levels would be the same relative to the No Build and Draft EIS Long-span Alternatives. For receptors where there is no exterior use, such as at places of worship and the University of Oregon, interior noise levels would range from 39 dBA Leq(h) to 42 dBA Leq(h) with none of these locations exceeding the NAAC. These results are the same as or 1 dB lower than those for the No Build and Draft EIS Long-span Alternatives.

For the Refined Long-span Alternative, relative to Existing Conditions, traffic noise levels are predicted to increase in some areas and decrease in others. On average, there would be no change. Increases up to 1 dB would be due to increased traffic volumes on area roadways. Decreases up to 2 dB would be due to moving the traffic noise source away from receptors (i.e., reduced width of Burnside Bridge) and reductions in traffic volumes on some roadways as other projects come online in the area network that would change traffic patterns in the area. As with the Existing Conditions, traffic noise levels would be highest for outdoor use areas located closest to I-5 on the east side of the Willamette River. Traffic noise levels on the west side of the river result mostly from I-5 traffic noise originating on the east side of the river but are also influenced by traffic on Burnside Street and Naito Parkway.

Compared to the No Build and Build Alternatives reported in the Draft EIS the Refined Long-span Alternative would result in five fewer residential impacts.

Figure 4. Measurement Locations and Receivers, and Noise Sensitive Land Use Near West Landing

Figure 5. Measurement Locations and Receivers, and Noise Sensitive Land Use Near East Landing



8 Potential Mitigation

The mitigation and abatement strategies for the Refined Long-span Alternative are the same as those evaluated for other build alternatives in the *EQRB Noise and Vibration Technical Report* (Multnomah County 2021c). Noise walls would not be feasible for abatement of long-term impacts. Temporary construction-related impacts would be reduced as documented in the *EQRB Noise and Vibration Technical Report* (Multnomah County 2021c) and repeated here.

8.1 Evaluation of Short-term Abatement Measures

To avoid, minimize, and abate temporary adverse noise and vibration impacts the following measures, as described in Section 290.32 of ODOT standard specifications, should be implemented to the extent practicable:

> **"00290.32 Noise Control** - Comply with ORS 467, OAR 340-035, all other applicable Laws, and the following construction noise abatement measures:
>
> - Do not perform construction within 1,000 feet of an occupied dwelling on Sundays or legal holidays, or between the hours of 10:00 p.m. and 6:00 a.m. on other days, without the approval of the Engineer.
> - Use Equipment with sound control devices no less effective than those provided on the original Equipment. Equipment with un-muffled exhausts is prohibited.
> - Use Equipment complying with pertinent equipment noise standards of the Environmental Protection Agency.
> - Do not drive piling or perform blasting operations within 3,000 feet of an occupied dwelling on Sundays or legal holidays, or between the hours of 8:00 p.m. and 8:00 a.m. on other days, without the approval of the Engineer.
> - Mitigate the noise from Rock crushing or screening operations performed within 3,000 feet of all occupied dwellings by placing material stockpiles between the operation and the affected dwellings, or by other means approved by the Engineer.
>
> If a specific noise impact complaint occurs during the construction of the Project, one or more of the following noise mitigation measures may be required, at no additional cost to the Agency, as directed by the Engineer:
>
> - Locate stationary construction Equipment as far from nearby noise sensitive properties as feasible.
> - Shut off idling Equipment.
> - Reschedule construction operations to avoid periods of noise annoyance identified in the complaint.
> - Notify nearby residents whenever extremely noisy Work will be occurring.
> - Install temporary or portable acoustic barriers around stationary construction noise sources.

- Operate electric-powered Equipment using line voltage power or solar power."

Multnomah County would obtain construction noise variances as needed from the City of Portland. Specifically, the contractor for the Project would be required to obtain construction noise variances from the City of Portland via their variance process. This effort would require the contractor to implement specific mitigation measures to reduce and minimize construction noise to the extent practicable.

Vibration-producing construction equipment shall be operated in such a manner to avoid damaging nearby sensitive structures and minimize annoyance to people living or utilizing institutional lands nearby. Potential mitigation strategies may include implementing caisson drilling rather than pile driving and using hand tools where it is not possible to construct with heavy machinery. Additionally, vibration monitoring during construction should be implemented at vibration sensitive structures to identify the onset of exceedance conditions so that the construction contractor may rectify any issues and avoid damage to nearby structures.

9 Agency Coordination

No additional agency coordination occurred in preparation of this memorandum.

10 Preparers

Name	Professional Affiliation [firm or organization]	Education [degree or certification]	Years of Experience
Scott Noel	HMMH	Bachelors Geography and Environmental Planning	21
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Joe Czech	HMMH	B.S. Aerospace Engineering	32

11 References

Multnomah County

2021a EQRB Description of Alternatives Report. https://www.multco.us/earthquake-ready-burnside-bridge/project-library

2021b EQRB Draft Environmental Impact Statement. https://www.multco.us/earthquake-ready-burnside-bridge/project-library.

2021c EQRB Noise and Vibration Technical Report. https://www.multco.us/earthquake-ready-burnside-bridge/project-library.

2022a EQRB Supplemental Draft Environmental Impact Statement. https://www.multco.us/earthquake-ready-burnside-bridge/project-library.

2022b EQRB Transportation Supplemental Memorandum. https://www.multco.us/earthquake-ready-burnside-bridge/project-library.

Appendix A. Federal Highway Administration Traffic Noise Model Electronic Files

Appendix B. Modeling Results

1

Table B-1. Predicted Traffic Noise Levels (dBA $L_{eq(h)}$)

Receiver	NAC Cat	Land Use	ODOT NAAC	No. of Uses	Existing Peak Vehicular Hour Noise (dBA Leq)	Existing Peak Truck Hour Noise (dBA Leq)	Existing Worst Noise Hour (dBA Leq)	Delta (dB)	No Build (2045) Peak Vehicular Hour Noise (dBA Leq)	No Build (2045) Peak Truck Hour Noise (dBA Leq)	No Build (2045) Worst Noise Hour (dBA Leq)	Delta (dB)	Build Refined Long-span Alt. (2045) Peak Vehicular Hour Noise (dBA Leq)	Build Refined Long-span Alt. (2045) Peak Truck Hour Noise (dBA Leq)	Build Refined Long-span Alt. (2045) Worst Noise Hour (dBA Leq)	Change vs. Existing (dB)
R-01	D	Church	50	1	41	40	41	-1	41	39	41	0	40	39	40	-1
R-02	C	Waterfront Park	65	1	63	63	63	0	63	63	63	0	63	63	63	0
R-03	C	Waterfront Park	65	1	63	64	64	1	64	64	64	0	64	64	64	0
R-04	C	Waterfront Park	65	1	64	64	64	0	64	65	65	1	64	65	65	1
R-05	C	Waterfront Park	65	1	63	64	64	1	64	64	64	0	63	64	64	0
R-06	C	Waterfront Park	65	1	64	65	65	1	65	65	65	0	64	65	65	0
R-07	D	Women's Shelter	50	1	41	40	41	-1	41	39	41	0	40	39	40	-1
R-08	C	Waterfront Park	65	1	65	65	65	0	65	65	65	0	64	65	65	0
R-09	C	Japanese American Historical Plaza	65	1	63	64	64	1	63	64	64	0	63	64	64	0
R-10	D	University of Oregon	50	1	40	40	40	0	40	40	40	0	39	40	40	0
R-11	C	Waterfront Park	65	1	64	64	64	0	64	64	64	0	64	64	64	0
R-12	C	Waterfront Park	65	1	63	64	64	1	64	64	64	0	63	64	64	0
R-13	C	Eastbank Esplanade	65	1	72	72	72	0	72	72	72	0	72	72	72	0
R-14	C	Eastbank Esplanade	65	1	67	66	67	-1	67	66	67	0	67	66	67	0

Table B-1. Predicted Traffic Noise Levels (dBA $L_{eq(h)}$)

Receiver	NAC Cat	Land Use	ODOT NAAC	No. of Uses	Existing Peak Vehicular Hour Noise (dBA Leq)	Existing Peak Truck Hour Noise (dBA Leq)	Existing Worst Noise Hour (dBA Leq)	Delta (dB)	No Build (2045) Peak Vehicular Hour Noise (dBA Leq)	No Build (2045) Peak Truck Hour Noise (dBA Leq)	No Build (2045) Worst Noise Hour (dBA Leq)	Delta (dB)	Build Refined Long-span Alt. (2045) Peak Vehicular Hour Noise (dBA Leq)	Build Refined Long-span Alt. (2045) Peak Truck Hour Noise (dBA Leq)	Build Refined Long-span Alt. (2045) Worst Noise Hour (dBA Leq)	Change vs. Existing (dB)
R-15	C	Eastbank Esplanade	65	1	68	67	68	-1	68	67	68	0	68	67	68	0
R-16	C	Eastbank Esplanade	65	1	68	67	68	-1	68	67	68	0	68	67	68	0
R-17	C	Eastbank Esplanade	65	1	67	67	67	0	68	67	68	1	68	67	68	1
R-18	B	BBQ/Recreation at Apartments	65	165	68	67	68	-1	67	67	67	-1	67	67	67	-1
R-19-F1	B	Residential	65	1	67	66	67	-1	66	66	66	-1	66	66	66	-1
R-19-F2	B	Residential	65	1	67	67	67	0	66	67	67	0	66	67	67	0
R-19-F3	B	Residential	65	1	67	67	67	0	67	67	67	0	66	67	67	0
R-19-F4	B	Residential	65	1	67	68	68	1	67	68	68	0	67	68	68	0
R-19-F5	B	Residential	65	1	67	68	68	1	67	68	68	0	67	68	68	0
R-19-F6	B	Residential	65	1	68	68	68	0	67	68	68	0	67	68	68	0
R-19-F7	B	Residential	65	1	68	68	68	0	68	69	69	1	67	69	69	1
R-19-F8	B	Residential	65	1	68	68	68	0	68	69	69	1	67	69	69	1
R-19-F9 to F17	B	Residential	65	9	68	69	69	1	68	69	69	0	68	69	69	0
R-20-F1	B	Residential	65	1	66	67	67	1	66	67	67	0	66	67	67	0
R-20-F2	B	Residential	65	1	66	67	67	1	66	67	67	0	66	68	68	1
R-20-F3	B	Residential	65	1	67	68	68	1	67	68	68	0	67	68	68	0

Table B-1. Predicted Traffic Noise Levels (dBA $L_{eq(h)}$)

Receiver	NAC Cat	Land Use	ODOT NAAC	No. of Uses	Existing Peak Vehicular Hour Noise (dBA Leq)	Existing Peak Truck Hour Noise (dBA Leq)	Existing Worst Noise Hour (dBA Leq)	Delta (dB)	No Build (2045) Peak Vehicular Hour Noise (dBA Leq)	No Build (2045) Peak Truck Hour Noise (dBA Leq)	No Build (2045) Worst Noise Hour (dBA Leq)	Delta (dB)	Build Refined Long-span Alt. (2045) Peak Vehicular Hour Noise (dBA Leq)	Build Refined Long-span Alt. (2045) Peak Truck Hour Noise (dBA Leq)	Build Refined Long-span Alt. (2045) Worst Noise Hour (dBA Leq)	Change vs. Existing (dB)
R-20-F4	B	Residential	65	1	67	68	68	1	67	68	68	0	67	68	68	0
R-20-F5	B	Residential	65	1	67	68	68	1	67	68	68	0	67	68	68	0
R-20-F6	B	Residential	65	1	67	69	69	2	68	69	69	0	67	69	69	0
R-20-F7	B	Residential	65	1	68	69	69	1	68	69	69	0	68	69	69	0
R-20-F8	B	Residential	65	1	68	69	69	1	68	69	69	0	68	69	69	0
R-20-F9 to F17	B	Residential	65	9	68	69	69	1	68	69	69	0	68	69	69	0
R-21-F1	B	Residential	65	1	65	66	66	1	65	66	66	0	65	66	66	0
R-21-F2	B	Residential	65	1	65	66	66	1	65	66	66	0	65	66	66	0
R-21-F3	B	Residential	65	1	65	66	66	1	65	66	66	0	65	66	66	0
R-21-F4	B	Residential	65	1	65	66	66	1	65	66	66	0	65	66	66	0
R-21-F5 to F17	B	Residential	65	13	65	66	66	1	65	67	67	1	65	67	67	1
R-22-F1	B	Residential	65	1	59	59	59	0	59	59	59	0	58	59	59	0
R-22-F2	B	Residential	65	1	59	59	59	0	59	59	59	0	58	59	59	0
R-22-F3	B	Residential	65	1	59	59	59	0	59	59	59	0	58	59	59	0
R-22-F4	B	Residential	65	1	59	59	59	0	59	59	59	0	58	59	59	0
R-22-F5	B	Residential	65	1	59	59	59	0	59	59	59	0	58	59	59	0
R-22-F6	B	Residential	65	1	60	60	60	0	60	60	60	0	59	60	60	0
R-22-F7 to F17	B	Residential	65	11	66	67	67	1	66	67	67	0	66	67	67	0

Table B-1. Predicted Traffic Noise Levels (dBA $L_{eq(h)}$)

Receiver	NAC Cat	Land Use	ODOT NAAC	No. of Uses	Existing Peak Vehicular Hour Noise (dBA Leq)	Existing Peak Truck Hour Noise (dBA Leq)	Existing Worst Noise Hour (dBA Leq)	Delta (dB)	No Build (2045) Peak Vehicular Hour Noise (dBA Leq)	No Build (2045) Peak Truck Hour Noise (dBA Leq)	No Build (2045) Worst Noise Hour (dBA Leq)	Delta (dB)	Build Refined Long-span Alt. (2045) Peak Vehicular Hour Noise (dBA Leq)	Build Refined Long-span Alt. (2045) Peak Truck Hour Noise (dBA Leq)	Build Refined Long-span Alt. (2045) Worst Noise Hour (dBA Leq)	Change vs. Existing (dB)
R-23-F1	B	Residential	65	1	60	59	60	-1	60	60	60	0	58	59	59	-1
R-23-F2	B	Residential	65	1	60	59	60	-1	60	59	60	0	58	59	59	-1
R-23-F3	B	Residential	65	1	60	59	60	-1	60	59	60	0	58	59	59	-1
R-23-F4	B	Residential	65	1	60	59	60	-1	60	59	60	0	58	59	59	-1
R-23-F5	B	Residential	65	1	60	59	60	-1	60	60	60	0	58	59	59	-1
R-23-F6	B	Residential	65	1	60	60	60	0	60	60	60	0	59	60	60	0
R-23-F7 to F17	B	Residential	65	11	65	66	66	1	65	66	66	0	65	66	66	0
R-24-F1	B	Residential	65	1	62	61	62	-1	62	61	62	0	60	61	61	-1
R-24-F2	B	Residential	65	1	62	61	62	-1	62	61	62	0	60	61	61	-1
R-24-F3	B	Residential	65	1	62	61	62	-1	62	61	62	0	60	61	61	-1
R-24-F4	B	Residential	65	1	62	61	62	-1	62	61	62	0	60	61	61	-1
R-24-F5	B	Residential	65	1	62	61	62	-1	62	61	62	0	60	61	61	-1
R-24-F6	B	Residential	65	1	62	61	62	-1	62	61	62	0	60	61	61	-1
R-24-F7 to F17	B	Residential	65	11	64	64	64	0	64	65	65	1	64	65	65	1
R-25-F1	B	Residential	65	1	66	63	66	-3	67	64	67	1	64	64	64	-2
R-25-F2	B	Residential	65	1	67	64	67	-3	67	65	67	0	65	65	65	-2
R-25-F3	B	Residential	65	1	67	64	67	-3	67	65	67	0	65	65	65	-2
R-25-F4	B	Residential	65	1	67	65	67	-2	67	65	67	0	65	65	65	-2

Table B-1. Predicted Traffic Noise Levels (dBA $L_{eq(h)}$)

Receiver	NAC Cat	Land Use	ODOT NAAC	No. of Uses	Existing Peak Vehicular Hour Noise (dBA Leq)	Existing Peak Truck Hour Noise (dBA Leq)	Existing Worst Noise Hour (dBA Leq)	Delta (dB)	No Build (2045) Peak Vehicular Hour Noise (dBA Leq)	No Build (2045) Peak Truck Hour Noise (dBA Leq)	No Build (2045) Worst Noise Hour (dBA Leq)	Delta (dB)	Build Refined Long-span Alt. (2045) Peak Vehicular Hour Noise (dBA Leq)	Build Refined Long-span Alt. (2045) Peak Truck Hour Noise (dBA Leq)	Build Refined Long-span Alt. (2045) Worst Noise Hour (dBA Leq)	Change vs. Existing (dB)
R-25-F5	B	Residential	65	1	67	65	67	-2	67	66	67	0	65	66	66	-1
R-25-F6	B	Residential	65	1	67	65	67	-2	67	66	67	0	65	66	66	-1
R-25-F7	B	Residential	65	1	67	66	67	-1	67	66	67	0	66	66	66	-1
R-25-F8	B	Residential	65	1	67	66	67	-1	67	67	67	0	66	67	67	0
R-25-F9 - F17	B	Residential	65	9	67	66	67	-1	68	67	68	1	66	67	67	0
R-26	E	Restaurant Outdoor Seating	70	1	69	67	69	-2	69	67	69	0	66	67	67	-2
R-27	B	Residential	65	1	67	67	67	0	68	68	68	1	67	68	68	1
R-28	B	Residential	65	1	68	68	68	0	68	68	68	0	68	68	68	0
R-29	B	Residential	65	1	69	69	69	0	69	69	69	0	69	69	69	0
R-30	B	Residential	65	1	72	74	74	2	73	75	75	1	73	75	75	1
R-31	B	Residential	65	1	72	74	74	2	72	74	74	0	72	74	74	0
R-32-F1	B	Residential	65	1	66	63	66	-3	66	64	66	0	63	64	64	-2
R-32-F2	B	Residential	65	1	65	63	65	-2	65	63	65	0	62	63	63	-2
R-32-F3	B	Residential	65	1	65	63	65	-2	65	63	65	0	62	63	63	-2
R-32-F4	B	Residential	65	1	64	63	64	-1	64	63	64	0	62	63	63	-1
R-32-F5	B	Residential	65	1	65	63	65	-2	65	63	65	0	62	63	63	-2
R-33-F1	B	Residential	65	1	67	69	69	2	67	68	68	-1	66	68	68	-1
R-33-F2	B	Residential	65	1	66	68	68	2	66	67	67	-1	65	67	67	-1

Table B-1. Predicted Traffic Noise Levels (dBA $L_{eq(h)}$)

Receiver	NAC Cat	Land Use	ODOT NAAC	No. of Uses	Existing Peak Vehicular Hour Noise (dBA Leq)	Existing Peak Truck Hour Noise (dBA Leq)	Existing Worst Noise Hour (dBA Leq)	Delta (dB)	No Build (2045) Peak Vehicular Hour Noise (dBA Leq)	No Build (2045) Peak Truck Hour Noise (dBA Leq)	No Build (2045) Worst Noise Hour (dBA Leq)	Delta (dB)	Build Refined Long-span Alt. (2045) Peak Vehicular Hour Noise (dBA Leq)	Build Refined Long-span Alt. (2045) Peak Truck Hour Noise (dBA Leq)	Build Refined Long-span Alt. (2045) Worst Noise Hour (dBA Leq)	Change vs. Existing (dB)
R-33-F3	B	Residential	65	1	66	68	68	2	66	67	67	-1	65	67	67	-1
R-34-F1	B	Residential	65	1	64	65	65	1	64	65	65	0	64	65	65	0
R-34-F2	B	Residential	65	1	64	64	64	0	64	64	64	0	64	64	64	0
R-34-F3	B	Residential	65	1	63	64	64	1	63	64	64	0	63	64	64	0
R-35-F1	B	Residential	65	1	62	61	62	-1	62	62	62	0	62	61	62	0
R-35-F2	B	Residential	65	1	61	61	61	0	62	61	62	1	61	61	61	0
R-35-F3	B	Residential	65	1	61	61	61	0	61	61	61	0	61	61	61	0
R-36	C	Skate Park	65	1	62	62	62	0	63	62	63	1	63	63	63	1
R-37 (Portland Rescue Mission)	D	Shelter	50	1	41	39	41	-2	41	39	41	0	39	39	39	-2
R-38 (University of Oregon Design /Journalism)	D	University	50	1	43	42	43	-1	43	42	43	0	41	42	42	-1
R-39 (Skidmore Fountain)	C	Fountain	65	1	60	60	60	0	60	60	60	0	59	60	60	0

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Appendix C. Traffic Data

Data for Noise Team
Revised on 7/14/21 by Parame Updated #

	Direction	Start Point	End Point	PM Peak Vehicular Hour (5-6pm)												Peak Truck Hour (10-11am)											
				Speeds	Peak Volume	Cars #	Cars %	MT #	MT %	HT #	HT %	Bus #	Bus %	MC #	MC %	Speeds	Peak Volume	Cars #	Cars %	MT #	MT %	HT #	HT %	Bus #	Bus %	MC #	MC %
Burnside Street																											
	EB	2nd Ave	Couch St	25	1,485	1,443	97.2%	12	0.8%	1	0.1%	24	1.6%	4	0.3%	25	890	841	94.5%	23	2.6%	3	0.3%	22	2.5%	1	0.1%
	EB	Couch St	MLK Jr. Blvd	10	1,495	1,453	97.2%	12	0.8%	1	0.1%	24	1.6%	4	0.3%	25	895	846	94.5%	23	2.6%	3	0.3%	22	2.5%	1	0.1%
	EB	MLK Jr. Blvd	Grand Ave	10	1,410	1,371	97.2%	11	0.8%	1	0.1%	23	1.6%	4	0.3%	25	845	799	94.5%	22	2.6%	3	0.3%	21	2.5%	1	0.1%
	WB	Couch St	2nd Ave	35	1,105	1,075	97.3%	7	0.6%	0	0.0%	21	1.9%	2	0.2%	25	665	626	94.2%	32	2.9%	2	0.2%	24	2.2%	6	0.5%
Couch Street																											
	WB	Grand Ave	MLK Jr. Blvd	10	1,180	1,148	97.3%	7	0.6%	0	0.0%	22	1.9%	2	0.2%	25	710	669	94.2%	21	2.9%	1	0.2%	16	2.2%	4	0.5%
	WB	MLK Jr. Blvd	Burnside St	10	1,115	1,085	97.3%	7	0.6%	0	0.0%	21	1.9%	2	0.2%	25	670	631	94.2%	19	2.9%	1	0.2%	15	2.2%	3	0.5%
Grand Avenue																											
	NB	Ash St	Ankeny St	10	1,460	1,420	97.3%	10	0.7%	1	0.1%	26	1.8%	4	0.3%	30	875	826	94.4%	24	2.8%	2	0.3%	21	2.4%	3	0.3%
	NB	Ankeny St	Burnside St	10	1,475	1,434	97.3%	10	0.7%	1	0.1%	26	1.8%	4	0.3%	30	885	835	94.4%	24	2.8%	2	0.3%	21	2.4%	3	0.3%
	NB	Burnside St	Couch St	10	1,700	1,653	97.3%	12	0.7%	1	0.1%	30	1.8%	4	0.3%	30	1,020	636	94.4%	28	2.8%	3	0.3%	24	2.4%	3	0.3%
	NB	Couch St	Davis St	10	1,500	1,459	97.3%	11	0.7%	1	0.1%	26	1.8%	4	0.3%	30	900	849	94.4%	25	2.8%	2	0.3%	21	2.4%	3	0.3%
MLK Jr. Blvd																											
	SB	Davis St	Couch St	10	1,645	1,599	97.2%	12	0.8%	1	0.1%	28	1.7%	5	0.3%	30	985	930	94.4%	26	2.7%	3	0.3%	24	2.4%	2	0.2%
	SB	Couch St	Burnside St	10	1,710	1,663	97.2%	13	0.8%	1	0.1%	29	1.7%	5	0.3%	30	1,025	968	94.4%	27	2.7%	3	0.3%	25	2.4%	2	0.2%
	SB	Burnside St	Ankeny St	15	1,795	1,745	97.2%	13	0.8%	1	0.1%	30	1.7%	5	0.3%	30	1,075	1,015	94.4%	29	2.7%	3	0.3%	26	2.4%	2	0.2%
	SB	Ankeny St	Ash St	15	1,770	1,721	97.2%	13	0.8%	1	0.1%	30	1.7%	5	0.3%	30	1,060	1,001	94.4%	28	2.7%	3	0.3%	26	2.4%	2	0.2%
Naito Pkwy																											
	NB	Ash St	Ankeny St	15	670	653	97.5%	13	2.0%	1	0.2%	0	0.0%	2	0.3%	20	400	372	93.1%	26	6.6%	1	0.3%	0	0.0%	0	0.0%
	NB	Ankeny St	Couch St	15	680	663	97.5%	14	2.0%	1	0.2%	0	0.0%	2	0.3%	20	410	382	93.1%	27	6.6%	1	0.3%	0	0.0%	0	0.0%
	NB	Couch St	Davis St	15	670	653	97.5%	13	2.0%	1	0.2%	0	0.0%	2	0.3%	20	400	372	93.1%	26	6.6%	1	0.3%	0	0.0%	0	0.0%
	SB	Davis St	Couch St	20	635	623	98.1%	6	1.0%	1	0.2%	2	0.3%	3	0.4%	20	380	356	93.8%	16	4.3%	1	0.3%	4	1.1%	2	0.6%
	SB	Couch St	Ankeny St	20	725	711	98.1%	7	1.0%	1	0.2%	2	0.3%	3	0.4%	20	435	408	93.8%	19	4.3%	1	0.3%	5	1.1%	3	0.6%
	SB	Ankeny St	Ash St	20	825	809	98.1%	8	1.0%	2	0.2%	2	0.3%	3	0.4%	20	495	464	93.8%	21	4.3%	1	0.3%	5	1.1%	3	0.6%
SW/NW 2nd Avenue																											
	NB	Ash St	Ankeny St	10	500	488	97.5%	10	2.0%	1	0.2%	0	0.0%	2	0.3%	20	300	279	93.1%	20	6.6%	1	0.3%	0	0.0%	0	0.0%
	NB	Ankeny St	Burnside St	10	510	497	97.5%	10	2.0%	1	0.2%	0	0.0%	2	0.3%	20	305	284	93.1%	20	6.6%	1	0.3%	0	0.0%	0	0.0%
	NB	Burnside St	Couch St	10	465	453	97.5%	9	2.0%	1	0.2%	0	0.0%	1	0.3%	20	280	261	93.1%	18	6.6%	1	0.3%	0	0.0%	0	0.0%
	NB	Couch St	Davis St	10	385	375	97.5%	8	2.0%	1	0.2%	0	0.0%	1	0.3%	20	230	214	93.1%	15	6.6%	1	0.3%	0	0.0%	0	0.0%
I-5 NB																											
Mainline	NB			10	4,250	3,736	87.9%	166	3.9%	332	7.8%	13	0.3%	4	0.1%	35	4,790	3,995	83.4%	225	4.7%	479	10.0%	77	1.6%	14	0.3%
Off-Ramp	NB	I-84/Water Ave Off-ramp		10	2,995	2,633	87.9%	117	3.9%	234	7.8%	9	0.3%	3	0.1%	30	3,380	2,819	83.4%	159	4.7%	338	10.0%	54	1.6%	10	0.3%
Mainline	NB			10	1,255	1,103	87.9%	49	3.9%	98	7.8%	4	0.3%	1	0.1%	35	1,410	1,176	83.4%	66	4.7%	141	10.0%	23	1.6%	4	0.3%
On-Ramp	NB	Morrison Bridge On-ramp		10	1,135	998	87.9%	44	3.9%	89	7.8%	3	0.3%	1	0.1%	30	1,280	1,068	83.4%	60	4.7%	128	10.0%	20	1.6%	4	0.3%
Mainline	NB			15	2,390	2,101	87.9%	93	3.9%	186	7.8%	7	0.3%	2	0.1%	35	2,690	2,243	83.4%	126	4.7%	269	10.0%	43	1.6%	8	0.3%
On-Ramp	NB	I-84 WB On-ramp		20	1,245	1,094	87.9%	49	3.9%	97	7.8%	4	0.3%	1	0.1%	30	1,400	1,168	83.4%	66	4.7%	140	10.0%	22	1.6%	4	0.3%
Mainline	NB			15	3,635	3,195	87.9%	142	3.9%	284	7.8%	11	0.3%	4	0.1%	35	4,090	3,411	83.4%	192	4.7%	409	10.0%	65	1.6%	12	0.3%
I-5 SB																											
Mainline	SB			25	3,460	3,034	87.7%	131	3.8%	266	7.7%	24	0.7%	3	0.1%	45	3,350	2,861	85.4%	168	5.0%	288	8.6%	17	0.5%	17	0.5%
Off-Ramp	SB	I-84 EB Off-ramp		10	1,235	1,083	87.7%	47	3.8%	95	7.7%	9	0.7%	1	0.1%	30	1,195	1,021	85.4%	60	5.0%	103	8.6%	6	0.5%	6	0.5%
Mainline	SB			25	2,225	1,951	87.7%	85	3.8%	171	7.7%	16	0.7%	2	0.1%	45	2,155	1,840	85.4%	108	5.0%	185	8.6%	11	0.5%	11	0.5%
Off-Ramp	SB	Exit 300B (Morrison Bridge)		10	920	807	87.7%	35	3.8%	71	7.7%	6	0.7%	1	0.1%	30	890	760	85.4%	45	5.0%	77	8.6%	4	0.5%	4	0.5%
Mainline	SB			20	1,305	1,144	87.7%	50	3.8%	100	7.7%	9	0.7%	1	0.1%	45	1,265	1,080	85.4%	63	5.0%	109	8.6%	6	0.5%	6	0.5%
On-Ramp	SB	I-84 WB On-ramp		10	2,755	2,416	87.7%	105	3.8%	212	7.7%	19	0.7%	3	0.1%	40	2,670	2,280	85.4%	134	5.0%	230	8.6%	13	0.5%	13	0.5%
Mainline	SB			20	4,060	3,561	87.7%	154	3.8%	313	7.7%	28	0.7%	4	0.1%	45	3,935	3,360	85.4%	197	5.0%	338	8.6%	20	0.5%	20	0.5%

Vehicle mix percentages and speeds same as Existing
I-5 PM Volumes calculated based on the difference between the Existing and No Build travel demand plots
I-5 ADT Volumes calculated based on the PM peak percentages of ADT from Existing

Data for Noise Team
Completed on 7/14/21 by Parametrix

				PM Peak Vehicular Hour (5-6pm)												Peak Truck Hour (10-11am)											
	Direction	Start Point	End Point	Speeds	Peak Volume	Cars #	Cars %	MT #	MT %	HT #	HT %	Bus #	Bus %	MC #	MC %	Speeds	Peak Volume	Cars #	Cars %	MT #	MT %	HT #	HT %	Bus #	Bus %	MC #	MC %
Burnside Street																											
	EB	2nd Ave	Couch St	25	1,385	1,346	97.2%	11	0.8%	1	0.1%	22	1.6%	4	0.3%	25	830	784	94.5%	22	2.6%	2	0.3%	21	2.5%	1	0.1%
	EB	Couch St	MLK Jr. Blvd	10	1,395	1,356	97.2%	11	0.8%	1	0.1%	22	1.6%	4	0.3%	25	835	789	94.5%	22	2.6%	3	0.3%	21	2.5%	1	0.1%
	EB	MLK Jr. Blvd	Grand Ave	10	1,355	1,317	97.2%	11	0.8%	1	0.1%	22	1.6%	4	0.3%	25	815	770	94.5%	21	2.6%	2	0.3%	20	2.5%	1	0.1%
	WB	Couch St	2nd Ave	25	1,100	1,070	97.3%	7	0.6%	0	0.0%	21	1.9%	2	0.2%	25	660	622	94.2%	32	2.9%	2	0.2%	24	2.2%	6	0.5%
Couch Street																											
	WB	Grand Ave	MLK Jr. Blvd	10	1,175	1,143	97.3%	7	0.6%	0	0.0%	22	1.9%	2	0.2%	25	705	664	94.2%	20	2.9%	1	0.2%	16	2.2%	4	0.5%
	WB	MLK Jr. Blvd	Burnside St	10	1,110	1,080	97.3%	7	0.6%	0	0.0%	21	1.9%	2	0.2%	25	665	626	94.2%	19	2.9%	1	0.2%	15	2.2%	3	0.5%
Grand Avenue																											
	NB	Ash St	Ankeny St	10	1,470	1,430	97.3%	10	0.7%	1	0.1%	26	1.8%	4	0.3%	30	880	830	94.4%	24	2.8%	2	0.3%	21	2.4%	3	0.3%
	NB	Ankeny St	Burnside St	10	1,485	1,444	97.3%	10	0.7%	1	0.1%	26	1.8%	4	0.3%	30	890	840	94.4%	24	2.8%	2	0.3%	21	2.4%	3	0.3%
	NB	Burnside St	Couch St	10	1,675	1,629	97.3%	12	0.7%	1	0.1%	29	1.8%	4	0.3%	30	1,005	636	94.4%	28	2.8%	3	0.3%	24	2.4%	3	0.3%
	NB	Couch St	Davis St	10	1,485	1,444	97.3%	10	0.7%	1	0.1%	26	1.8%	4	0.3%	30	890	840	94.4%	24	2.8%	2	0.3%	21	2.4%	3	0.3%
MLK Jr. Blvd																											
	SB	Davis St	Couch St	10	1,670	1,624	97.2%	13	0.8%	1	0.1%	28	1.7%	5	0.3%	30	1,000	944	94.4%	27	2.7%	3	0.3%	24	2.4%	2	0.2%
	SB	Couch St	Burnside St	10	1,735	1,687	97.2%	13	0.8%	1	0.1%	29	1.7%	5	0.3%	30	1,040	982	94.4%	28	2.7%	3	0.3%	25	2.4%	2	0.2%
	SB	Burnside St	Ankeny St	15	1,775	1,726	97.2%	13	0.8%	1	0.1%	30	1.7%	5	0.3%	30	1,065	1,006	94.4%	28	2.7%	3	0.3%	26	2.4%	2	0.2%
	SB	Ankeny St	Ash St	15	1,750	1,701	97.2%	13	0.8%	1	0.1%	29	1.7%	5	0.3%	30	1,050	991	94.4%	28	2.7%	3	0.3%	25	2.4%	2	0.2%
Naito Pkwy																											
	NB	Ash St	Ankeny St	15	670	653	97.5%	13	2.0%	1	0.2%	0	0.0%	2	0.3%	20	400	372	93.1%	26	6.6%	1	0.3%	0	0.0%	0	0.0%
	NB	Ankeny St	Couch St	15	680	663	97.5%	14	2.0%	1	0.2%	0	0.0%	2	0.3%	20	410	382	93.1%	27	6.6%	1	0.3%	0	0.0%	0	0.0%
	NB	Couch St	Davis St	15	670	653	97.5%	13	2.0%	1	0.2%	0	0.0%	2	0.3%	20	400	372	93.1%	26	6.6%	1	0.3%	0	0.0%	0	0.0%
	SB	Davis St	Couch St	20	625	613	98.1%	6	1.0%	1	0.2%	2	0.3%	3	0.4%	20	375	352	93.8%	16	4.3%	1	0.3%	4	1.1%	2	0.6%
	SB	Couch St	Ankeny St	20	730	716	98.1%	7	1.0%	1	0.2%	2	0.3%	3	0.4%	20	440	413	93.8%	19	4.3%	1	0.3%	5	1.1%	3	0.6%
	SB	Ankeny St	Ash St	20	825	809	98.1%	8	1.0%	2	0.2%	2	0.3%	3	0.4%	20	495	464	93.8%	21	4.3%	1	0.3%	5	1.1%	3	0.6%
SW/NW 2nd Avenue																											
	NB	Ash St	Ankeny St	10	495	483	97.5%	10	2.0%	1	0.2%	0	0.0%	1	0.3%	20	295	275	93.1%	19	6.6%	1	0.3%	0	0.0%	0	0.0%
	NB	Ankeny St	Burnside St	10	505	492	97.5%	10	2.0%	1	0.2%	0	0.0%	2	0.3%	20	305	284	93.1%	20	6.6%	1	0.3%	0	0.0%	0	0.0%
	NB	Burnside St	Couch St	10	465	453	97.5%	9	2.0%	1	0.2%	0	0.0%	1	0.3%	20	280	261	93.1%	18	6.6%	1	0.3%	0	0.0%	0	0.0%
	NB	Couch St	Davis St	10	385	375	97.5%	8	2.0%	1	0.2%	0	0.0%	1	0.3%	20	230	214	93.1%	15	6.6%	1	0.3%	0	0.0%	0	0.0%
I-5 NB																											
Mainline	NB			10	4,250	3,736	87.9%	166	3.9%	332	7.8%	13	0.3%	4	0.1%	35	4,790	3,995	83.4%	225	4.7%	479	10.0%	77	1.6%	14	0.3%
Off-Ramp	NB	I-84/Water Ave Off-ramp		10	2,995	2,633	87.9%	117	3.9%	234	7.8%	9	0.3%	3	0.1%	30	3,380	2,819	83.4%	159	4.7%	338	10.0%	54	1.6%	10	0.3%
Mainline	NB			10	1,255	1,103	87.9%	49	3.9%	98	7.8%	4	0.3%	1	0.1%	35	1,410	1,176	83.4%	66	4.7%	141	10.0%	23	1.6%	4	0.3%
On-Ramp	NB	Morrison Bridge On-ramp		10	1,135	998	87.9%	44	3.9%	89	7.8%	3	0.3%	1	0.1%	30	1,280	1,068	83.4%	60	4.7%	128	10.0%	20	1.6%	4	0.3%
Mainline	NB			15	2,390	2,101	87.9%	93	3.9%	186	7.8%	7	0.3%	2	0.1%	35	2,690	2,243	83.4%	126	4.7%	269	10.0%	43	1.6%	8	0.3%
On-Ramp	NB	I-84 WB On-ramp		20	1,245	1,094	87.9%	49	3.9%	97	7.8%	4	0.3%	1	0.1%	30	1,400	1,168	83.4%	66	4.7%	140	10.0%	22	1.6%	4	0.3%
Mainline	NB			15	3,635	3,195	87.9%	142	3.9%	284	7.8%	11	0.3%	4	0.1%	35	4,090	3,411	83.4%	192	4.7%	409	10.0%	65	1.6%	12	0.3%
I-5 SB																											
Mainline	SB			25	3,460	3,034	87.7%	131	3.8%	266	7.7%	24	0.7%	3	0.1%	45	3,350	2,861	85.4%	168	5.0%	288	8.6%	17	0.5%	17	0.5%
Off-Ramp	SB	I-84 EB Off-ramp		10	1,235	1,083	87.7%	47	3.8%	95	7.7%	9	0.7%	1	0.1%	30	1,195	1,021	85.4%	60	5.0%	103	8.6%	6	0.5%	6	0.5%
Mainline	SB			25	2,225	1,951	87.7%	85	3.8%	171	7.7%	16	0.7%	2	0.1%	45	2,155	1,840	85.4%	108	5.0%	185	8.6%	11	0.5%	11	0.5%
Off-Ramp	SB	Exit 300B (Morrison Bridge)		10	920	807	87.7%	35	3.8%	71	7.7%	6	0.7%	1	0.1%	30	890	760	85.4%	45	5.0%	77	8.6%	4	0.5%	4	0.5%
Mainline	SB			20	1,305	1,144	87.7%	50	3.8%	100	7.7%	9	0.7%	1	0.1%	45	1,265	1,080	85.4%	63	5.0%	109	8.6%	6	0.5%	6	0.5%
On-Ramp	SB	I-84 WB On-ramp		10	2,755	2,416	87.7%	105	3.8%	212	7.7%	19	0.7%	3	0.1%	40	2,670	2,280	85.4%	134	5.0%	230	8.6%	13	0.5%	13	0.5%
Mainline	SB			20	4,060	3,561	87.7%	154	3.8%	313	7.7%	28	0.7%	4	0.1%	45	3,935	3,360	85.4%	197	5.0%	338	8.6%	20	0.5%	20	0.5%

Vehicle mix percentages and speeds same as Existing
I-5 PM Volumes calculated based on the difference between the Existing and No Build travel demand plots
I-5 ADT Volumes calculated based on the PM peak percentages of ADT from Existing

Data for Noise Team
Completed on 7/14/21 by Parametrix

				PM Peak Vehicular Hour (5-6pm)												Peak Truck Hour (10-11am)											
	Direction	Start Point	End Point	Speeds	Peak Volume	Cars #	Cars %	MT #	MT %	HT #	HT %	Bus #	Bus %	MC #	MC %	Speeds	Peak Volume	Cars #	Cars %	MT #	MT %	HT #	HT %	Bus #	Bus %	MC #	MC %
Burnside Street																											
	EB	2nd Ave	Couch St	25	1,485	1,443	97.2%	12	0.8%	1	0.1%	24	1.6%	4	0.3%	25	890	841	94.5%	23	2.6%	3	0.3%	22	2.5%	1	0.1%
	EB	Couch St	MLK Jr. Blvd	10	1,495	1,453	97.2%	12	0.8%	1	0.1%	24	1.6%	4	0.3%	25	895	846	94.5%	23	2.6%	3	0.3%	22	2.5%	1	0.1%
	EB	MLK Jr. Blvd	Grand Ave	10	1,410	1,371	97.2%	11	0.8%	1	0.1%	23	1.6%	4	0.3%	25	845	799	94.5%	22	2.6%	3	0.3%	21	2.5%	1	0.1%
	WB	Couch St	2nd Ave	25	1,055	1,027	97.3%	6	0.6%	0	0.0%	20	1.9%	2	0.2%	25	635	598	94.2%	31	2.9%	2	0.2%	23	2.2%	5	0.5%
Couch Street																											
	WB	Grand Ave	MLK Jr. Blvd	10	1,165	1,134	97.3%	7	0.6%	0	0.0%	22	1.9%	2	0.2%	25	700	659	94.2%	20	2.9%	1	0.2%	15	2.2%	4	0.5%
	WB	MLK Jr. Blvd	Burnside St	10	1,065	1,036	97.3%	6	0.6%	0	0.0%	20	1.9%	2	0.2%	25	640	603	94.2%	19	2.9%	1	0.2%	14	2.2%	3	0.5%
Grand Avenue																											
	NB	Ash St	Ankeny St	10	1,455	1,415	97.3%	10	0.7%	1	0.1%	25	1.8%	4	0.3%	30	875	826	94.4%	24	2.8%	2	0.3%	21	2.4%	3	0.3%
	NB	Ankeny St	Burnside St	10	1,470	1,430	97.3%	10	0.7%	1	0.1%	26	1.8%	4	0.3%	30	880	830	94.4%	24	2.8%	2	0.3%	21	2.4%	3	0.3%
	NB	Burnside St	Couch St	10	1,695	1,648	97.3%	12	0.7%	1	0.1%	30	1.8%	4	0.3%	30	1,015	636	94.4%	28	2.8%	3	0.3%	24	2.4%	3	0.3%
	NB	Couch St	Davis St	10	1,505	1,464	97.3%	11	0.7%	1	0.1%	26	1.8%	4	0.3%	30	905	854	94.4%	25	2.8%	2	0.3%	21	2.4%	3	0.3%
MLK Jr. Blvd																											
	SB	Davis St	Couch St	10	1,630	1,585	97.2%	12	0.8%	1	0.1%	27	1.7%	4	0.3%	30	980	925	94.4%	26	2.7%	3	0.3%	24	2.4%	2	0.2%
	SB	Couch St	Burnside St	10	1,730	1,682	97.2%	13	0.8%	1	0.1%	29	1.7%	5	0.3%	30	1,040	982	94.4%	28	2.7%	3	0.3%	25	2.4%	2	0.2%
	SB	Burnside St	Ankeny St	15	1,815	1,765	97.2%	14	0.8%	1	0.1%	30	1.7%	5	0.3%	30	1,090	1,029	94.4%	29	2.7%	3	0.3%	26	2.4%	2	0.2%
	SB	Ankeny St	Ash St	15	1,790	1,740	97.2%	13	0.8%	1	0.1%	30	1.7%	5	0.3%	30	1,075	1,015	94.4%	29	2.7%	3	0.3%	26	2.4%	2	0.2%
Naito Pkwy																											
	NB	Ash St	Ankeny St	15	670	653	97.5%	13	2.0%	1	0.2%	0	0.0%	2	0.3%	20	400	372	93.1%	26	6.6%	1	0.3%	0	0.0%	0	0.0%
	NB	Ankeny St	Couch St	15	680	663	97.5%	14	2.0%	1	0.2%	0	0.0%	2	0.3%	20	410	382	93.1%	27	6.6%	1	0.3%	0	0.0%	0	0.0%
	NB	Couch St	Davis St	15	690	673	97.5%	14	2.0%	1	0.2%	0	0.0%	2	0.3%	20	415	386	93.1%	27	6.6%	1	0.3%	0	0.0%	0	0.0%
	SB	Davis St	Couch St	20	640	628	98.1%	6	1.0%	1	0.2%	2	0.3%	3	0.4%	20	385	361	93.8%	17	4.3%	1	0.3%	4	1.1%	2	0.6%
	SB	Couch St	Ankeny St	20	710	697	98.1%	7	1.0%	1	0.2%	2	0.3%	3	0.4%	20	425	399	93.8%	18	4.3%	1	0.3%	5	1.1%	3	0.6%
	SB	Ankeny St	Ash St	20	810	795	98.1%	8	1.0%	2	0.2%	2	0.3%	3	0.4%	20	485	455	93.8%	21	4.3%	1	0.3%	5	1.1%	3	0.6%
SW/NW 2nd Avenue																											
	NB	Ash St	Ankeny St	10	505	492	97.5%	10	2.0%	1	0.2%	0	0.0%	2	0.3%	20	305	284	93.1%	20	6.6%	1	0.3%	0	0.0%	0	0.0%
	NB	Ankeny St	Burnside St	10	515	502	97.5%	10	2.0%	1	0.2%	0	0.0%	2	0.3%	20	310	289	93.1%	20	6.6%	1	0.3%	0	0.0%	0	0.0%
	NB	Burnside St	Couch St	10	425	414	97.5%	9	2.0%	1	0.2%	0	0.0%	1	0.3%	20	255	237	93.1%	17	6.6%	1	0.3%	0	0.0%	0	0.0%
	NB	Couch St	Davis St	10	365	356	97.5%	7	2.0%	1	0.2%	0	0.0%	1	0.3%	20	220	205	93.1%	15	6.6%	1	0.3%	0	0.0%	0	0.0%
I-5 NB																											
Mainline	NB			10	4,250	3,736	87.9%	166	3.9%	332	7.8%	13	0.3%	4	0.1%	35	4,790	3,995	83.4%	225	4.7%	479	10.0%	77	1.6%	14	0.3%
Off-Ramp	NB	I-84/Water Ave Off-ramp		10	2,995	2,633	87.9%	117	3.9%	234	7.8%	9	0.3%	3	0.1%	30	3,380	2,819	83.4%	159	4.7%	338	10.0%	54	1.6%	10	0.3%
Mainline	NB			10	1,255	1,103	87.9%	49	3.9%	98	7.8%	4	0.3%	1	0.1%	35	1,410	1,176	83.4%	66	4.7%	141	10.0%	23	1.6%	4	0.3%
On-Ramp	NB	Morrison Bridge On-ramp		10	1,135	998	87.9%	44	3.9%	89	7.8%	3	0.3%	1	0.1%	30	1,280	1,068	83.4%	60	4.7%	128	10.0%	20	1.6%	4	0.3%
Mainline	NB			15	2,390	2,101	87.9%	93	3.9%	186	7.8%	7	0.3%	2	0.1%	35	2,690	2,243	83.4%	126	4.7%	269	10.0%	43	1.6%	8	0.3%
On-Ramp	NB	I-84 WB On-ramp		20	1,245	1,094	87.9%	49	3.9%	97	7.8%	4	0.3%	1	0.1%	30	1,400	1,168	83.4%	66	4.7%	140	10.0%	22	1.6%	4	0.3%
Mainline	NB			15	3,635	3,195	87.9%	142	3.9%	284	7.8%	11	0.3%	4	0.1%	35	4,090	3,411	83.4%	192	4.7%	409	10.0%	65	1.6%	12	0.3%
I-5 SB																											
Mainline	SB			25	3,460	3,034	87.7%	131	3.8%	266	7.7%	24	0.7%	3	0.1%	45	3,350	2,861	85.4%	168	5.0%	288	8.6%	17	0.5%	17	0.5%
Off-Ramp	SB	I-84 EB Off-ramp		10	1,235	1,083	87.7%	47	3.8%	95	7.7%	9	0.7%	1	0.1%	30	1,195	1,021	85.4%	60	5.0%	103	8.6%	6	0.5%	6	0.5%
Mainline	SB			25	2,225	1,951	87.7%	85	3.8%	171	7.7%	16	0.7%	2	0.1%	45	2,155	1,840	85.4%	108	5.0%	185	8.6%	11	0.5%	11	0.5%
Off-Ramp	SB	Exit 300B (Morrison Bridge)		10	920	807	87.7%	35	3.8%	71	7.7%	6	0.7%	1	0.1%	30	890	760	85.4%	45	5.0%	77	8.6%	4	0.5%	4	0.5%
Mainline	SB			20	1,305	1,144	87.7%	50	3.8%	100	7.7%	9	0.7%	1	0.1%	45	1,265	1,080	85.4%	63	5.0%	109	8.6%	6	0.5%	6	0.5%
On-Ramp	SB	I-84 WB On-ramp		10	2,755	2,416	87.7%	105	3.8%	212	7.7%	19	0.7%	3	0.1%	40	2,670	2,280	85.4%	134	5.0%	230	8.6%	13	0.5%	13	0.5%
Mainline	SB			20	4,060	3,561	87.7%	154	3.8%	313	7.7%	28	0.7%	4	0.1%	45	3,935	3,360	85.4%	197	5.0%	338	8.6%	20	0.5%	20	0.5%

Vehicle mix percentages and speeds same as Existing
I-5 PM Volumes calculated based on the difference between the Existing and No Build travel demand plots
I-5 ADT Volumes calculated based on the PM peak percentages of ADT from Existing