

# **Noise Memorandum**

## **Poplar Way Extension Bridge**

**Lynnwood, Washington**

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## **Noise Memorandum**

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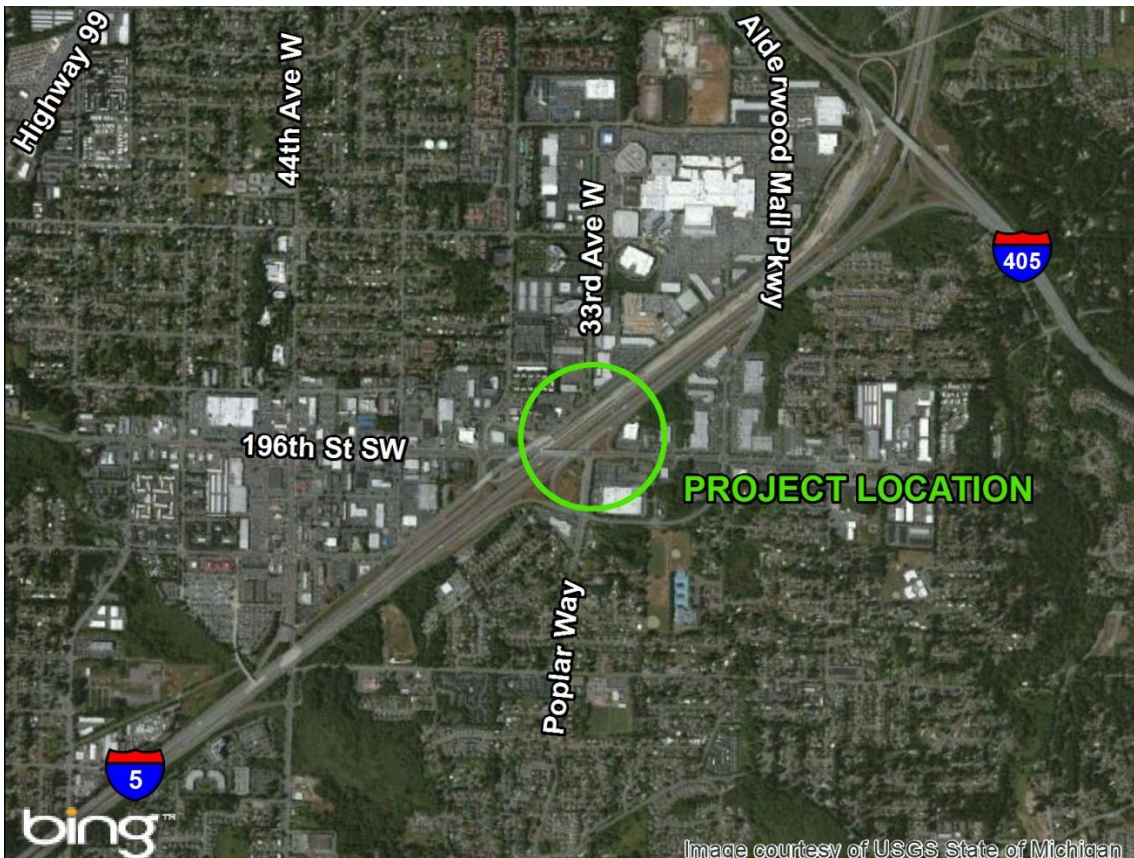
## Noise Memorandum

### 1.0 INTRODUCTION

The Poplar Way Extension Bridge is a key transportation improvement identified within the “Interstate 5 (I-5) to Lynnwood City Center Access Study,” developed by the City in cooperation with the Washington State Department of Transportation (WSDOT), the Federal Highway Administration (FHWA), and Snohomish County. The City proposes to construct a new bridge across I-5 between Poplar Way and 33rd Avenue W at approximately 196th Street SW. The proposed project is located in Lynnwood, Snohomish County, Washington. The project is in Township 27N, Range 04E, Sections 15 and 22. On I-5, the project crossing is at Milepost 180. See **Figure 1 – Project Location Map**.

Major elements of the Poplar Way Extension Bridge project will include a new multi-lane bridge structure, approximately 500 feet long with six vehicle lanes, and sidewalks and bike lanes on both sides. Intersection modifications will be made at Alderwood Mall Parkway/Poplar Way, 196th Street SW/Poplar Way, and Alderwood Mall Boulevard/33rd Avenue W. As part of the bridge span, new approach legs will be added to the 196th Street SW/Poplar Way and Alderwood Mall Boulevard/33rd Avenue W intersections. The project will also accommodate the Interurban Trail, which runs along Alderwood Mall Parkway on the west/northwest side of I-5. This trail is a regional, multi-use paved facility which connects communities from Shoreline to Everett.

**Figure 1 - Project Location Map**



## **2.0 NOISE ANALYSIS OVERVIEW**

This memorandum presents the results of a noise screening of the proposed Poplar Way Extension Bridge project. The noise screening presents the existing condition and future acoustical environment at various receptors in the project area.

The determination of noise impacts is in compliance with the Federal Highway Administration's (FHWA) Procedures for Abatement of Highway Traffic Noise and Construction Noise as presented in the Code of Federal Regulations, Title 23 Part 772 (23 CFR 772) and the Washington State Department of Transportation (WSDOT) *2011 Traffic Noise Policy and Procedures*, dated October 2012.

### Noise Model and Analysis

The FHWA's Procedures for Abatement of Highway Traffic Noise and Construction Noise is presented in the Code of Federal Regulations, Title 23 Part 772 (23 CFR 772). This regulation, plus other guidance documents written to explain the regulation, sets forth the process for performing a traffic noise analysis.

WSDOT's Noise Policy is the state's tool for implementing 23 CFR 772. The noise abatement criteria (NAC) presented in 23 CFR 772 establishes the criteria for various land uses. The noise level descriptor used is the equivalent sound level,  $L_{eq}$ , defined as the steady state sound level which, in a stated time period (usually one hour), and contains the same sound energy as the actual time-varying sound.

Noise abatement measures will be considered when the predicted noise levels approach or exceed those values shown for the appropriate activity category in Table 1, or when the predicted traffic noise levels substantially exceed the existing noise levels. WSDOT "considers a predicted sound level of 1 dBA below the NAC as sufficient to satisfy the condition of 'approach', or approaching the NAC, required by FHWA for all land use categories. For example, where the NAC is 67 dBA for outdoor use at a residence, a noise level of 66 dBA is considered an impact. Receivers are also considered impacted when the worst hourly traffic noise is predicted to increase 10 dBA ('substantial increase') or more between the Existing and Build conditions."<sup>1</sup>

TNM<sup>®</sup> 2.5 was used to analyze existing and future noise levels in the project area. TNM<sup>®</sup> 2.5 is FHWA's computer program for highway traffic noise prediction and analysis.

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<sup>1</sup> *2011 Traffic Noise Policy and Procedures*, Washington State Department of Transportation, October 2012, page 17.

**Table 1: Noise Abatement Criteria (NAC)  
Hourly A-Weighted Sound Level-Decibels (dBA)**

<b>Activity Category</b>	<b>L<sub>eq</sub>(h)* (dBA) at Evaluation Location</b>	<b>Activity Description</b>
A	57 (exterior)	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose
B	67 (exterior)	Residential
C	67 (exterior)	Active sport areas, amphitheaters, auditoriums, campgrounds, cemeteries, day care centers, hospitals, libraries, medical facilities, parks, picnic areas, places of worship, playgrounds, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, recreation areas, Section 4(f) sites, schools, television studios, trails and trail crossings
D	52 (interior)	Auditoriums, day care centers, hospitals, libraries, medical facilities, places of worship, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, schools, and television studios
E	72 (exterior)	Hotels, motels, offices, restaurants/bars, and other developed lands, properties or activities not included in A-D or F
F	--	Agriculture, airports, bus yards, emergency services, industrial, logging, maintenance facilities, manufacturing, mining, rail yards, retail facilities, shipyards, utilities (water resources, water treatment, electrical) and warehousing
G	--	Undeveloped lands that are not permitted for development

\* L<sub>eq</sub>(h) are A-weighted (dBA) hourly equivalent steady state sound levels used for impact determination and are not design standards for abatement.

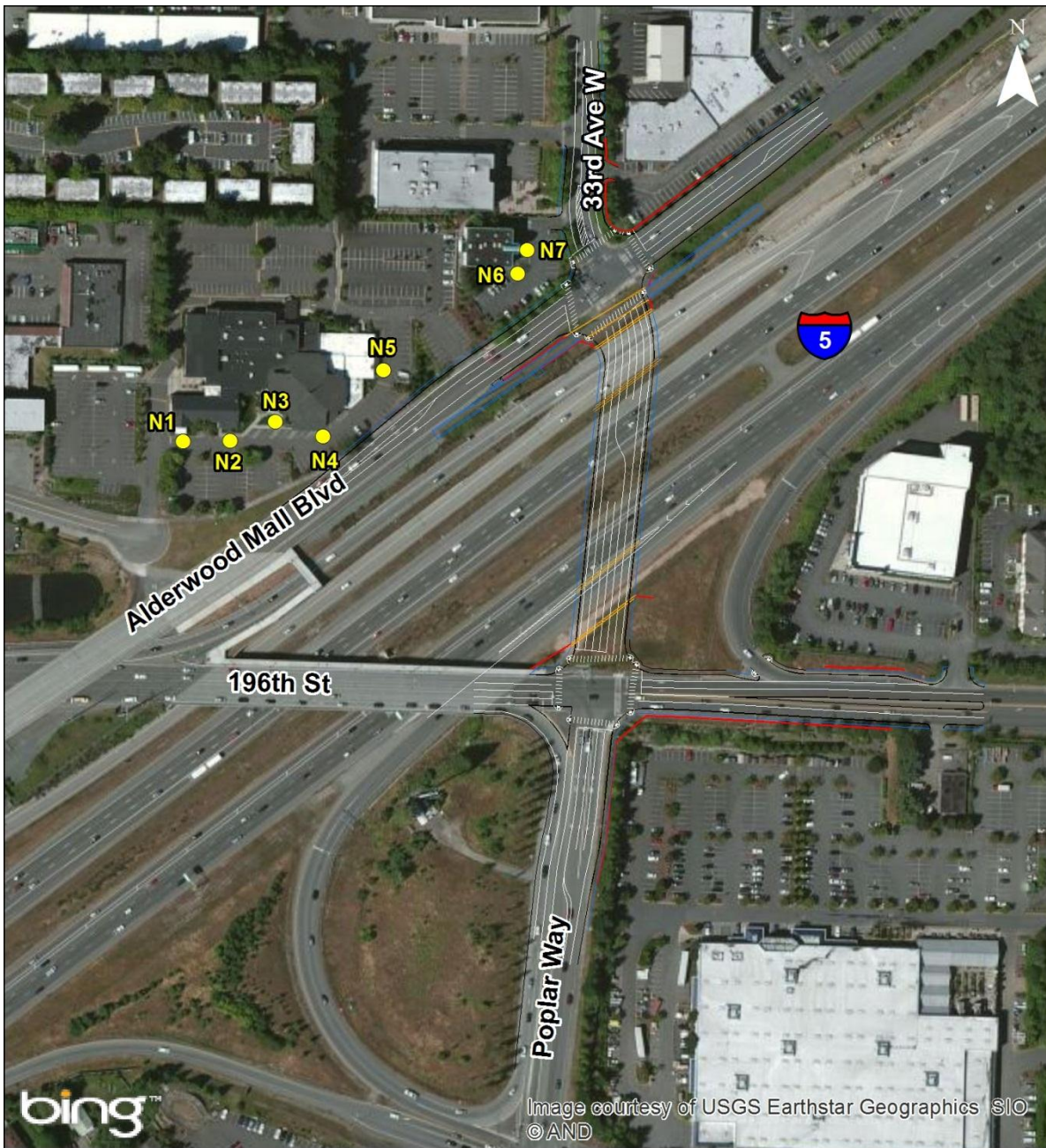
Source: 2011 Traffic Noise Policy and Procedures, Washington State Department of Transportation, October 2012, page 17.

This project, by definition, is a Type I project: new roadway on new alignment. However, since this bridge is crossing I-5, as shown in Figure 2, the Poplar Way Extension Bridge is not the controlling noise source in the area. The majority of properties in the study area are retail, Activity Category F. There is one place of worship (Alderwood Community Church), Activity Category C/D, and one office building, Activity Category E, in the northwest quadrant of the study area along Alderwood Mall Boulevard. Neither the place of worship nor the office building has any areas of frequent outdoor human use. Given the nature of the project it was recommended by WSDOT to perform a screening analysis.<sup>2</sup>

<sup>2</sup> Timothy Sexton, "Poplar Way Extension Bridge, Lynnwood, WA", e-mail message to John Jaeckel, October 17, 2013.



Figure 2 – Noise Receiver Locations



### 3.0 NOISE MODELING

The latest version of the FHWA's Traffic Noise Model, TNM<sup>®</sup>2.5<sup>3</sup>, was used to model existing (2011) and future build (2040) worst hourly traffic noise levels within the study area. Seven representative noise receptors, numbered N1 through N7 as shown on **Figure 2** were

<sup>3</sup> M.C. Lau, C.S.Y. Lee, J.L. Rochat, E.R. Boeker, and G.C. Fleming. FHWA Traffic Noise Model<sup>®</sup> Users Guide (Version 2.5 Addendum). Federal Highway Administration, April 2004

modeled. These receivers were selected to model representative noise impacts at the Alderwood Community Church (N1 through N5) and the office building at 19400 33<sup>rd</sup> Ave. W. (N6 and N7). The results of the computer modeling are presented in **Table 2**.

**Table 2  
Design Hour Noise Levels, dBA (Leq(h))**

Receiver Location	Land Use	Activity Category	FHWA / WSDOT NAC	PM Noise Level, $L_{eq}(h)$ (dBA)			Impact
				Predicted Existing (2011)	Predicted Build (2040)	Change (Fut – Ex)	
N1	Place of Worship	D*	52	38	40	2	No
N2				38	41	3	
N3				37	40	3	
N4				45	47	2	
N5				43	46	3	
N6	Office	E	72	64	68	4	No
N7				64	68	4	

\* Alderwood Community Church does not have outdoor human use areas. The interior sound level was modeled using the *light frame, ordinary sash (closed)* noise reduction factor of 20 dB.

#### 4.0 IMPACT ASSESSMENT

Predicted existing (2011) traffic noise levels presently range from 37 to 45 dBA Leq inside the Alderwood Community Church and are 64 dBA adjacent to the office building. The proposed Poplar Way Bridge Extension project would create noise levels within the church that range from 40 to 47 dBA and would be 68 dBA Leq at the office building. None of the future noise levels approach or exceed the NAC for the respective receptors.

#### 4.0 CONSTRUCTION NOISE

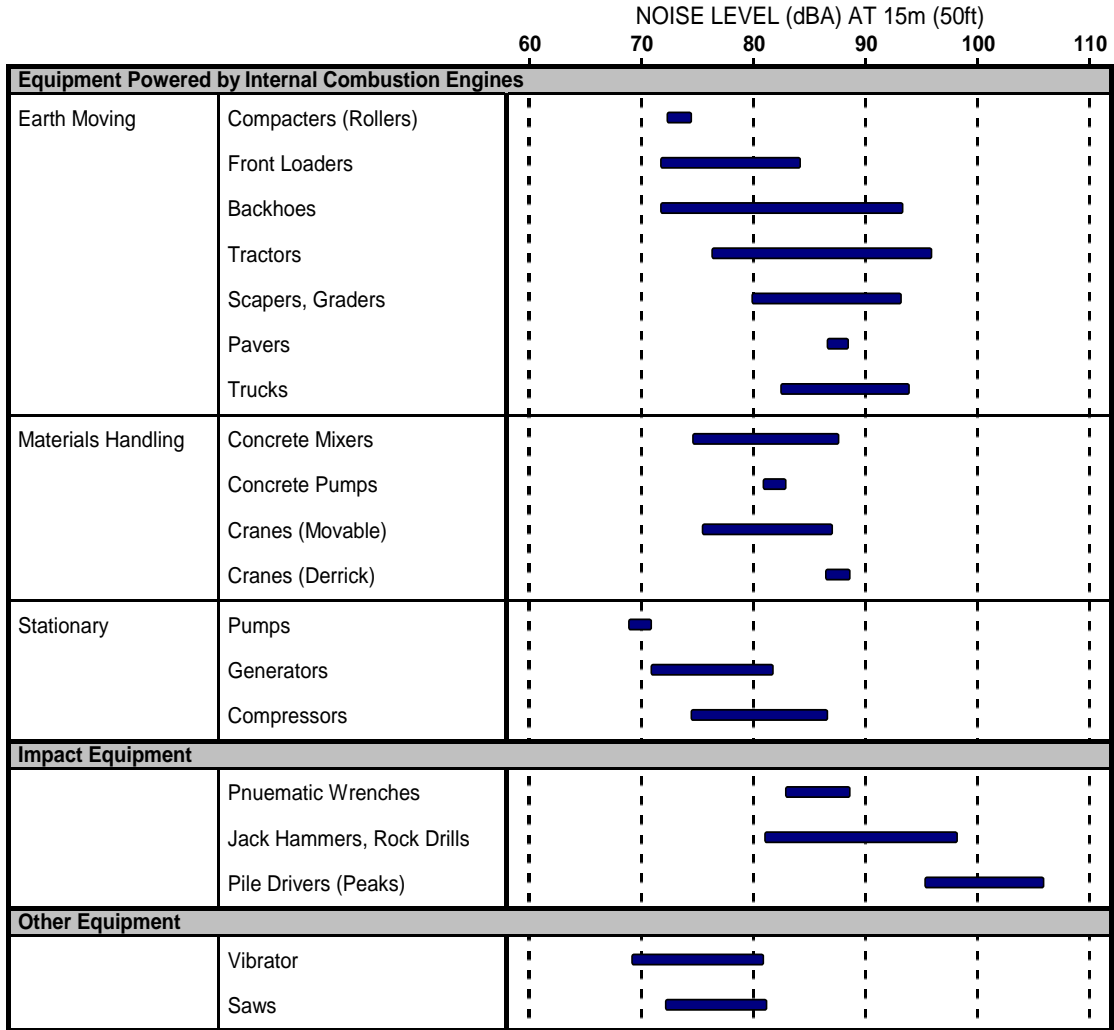
Construction noise is temporary but may affect nearby property owners or residents. During project development, and before construction begins, project office staff should consider ways to reduce or mitigate the impacts of construction activities. All reasonable methods shall be incorporated in the plans and specifications of the contract.

In most cases, daytime noise from construction activities is exempt from state and local laws. However, in some cases, coordination with, or permits from, local agencies may be needed. For temporary night construction noise, a variance or exemption from the municipal or county codes is typically required. Local jurisdictions may need to be contacted to clarify local regulations, determine if a permit is required, and discuss if there are concerns or restrictions that could affect the project. Some acoustical information and analysis may be needed before the local agency will grant a permit. This is done on a case-by-case basis.

In general, the noise analysis should identify the local regulations that apply to construction noise under standard situations. The acquisition of applicable permits or variances is typically handled by WSDOT through a process separate from the noise analysis.<sup>4</sup>

<sup>4</sup> 2011 Traffic Noise Policy and Procedures, Washington State Department of Transportation, October 2012, page 38.

**Table 3  
Construction Equipment Sound Levels**



SOURCE: U.S. Report to the President and Congress on Noise, February, 1972.

**6.0 CONCLUSION**

Based on the study completed, the proposed the Poplar Way Extension Bridge project would not create a noise impact. If it subsequently develops during final design that these conditions have substantially changed, the noise screening would need to be updated.



## **REFERENCES**

Lau, M.C., C.S.Y. Lee, J.L. Rochat, E.R. Boeker, and G.C. Fleming. FHWA Traffic Noise Model<sup>®</sup> Users Guide (Version 2.5 Addendum). Federal Highway Administration, April 2004.

Sexton, Timothy, "Poplar Way Extension Bridge, Lynnwood, WA", e-mail message to John Jaeckel, October 17, 2013.

"2011 Traffic Noise Policy and Procedures", Washington State Department of Transportation, October 2012.