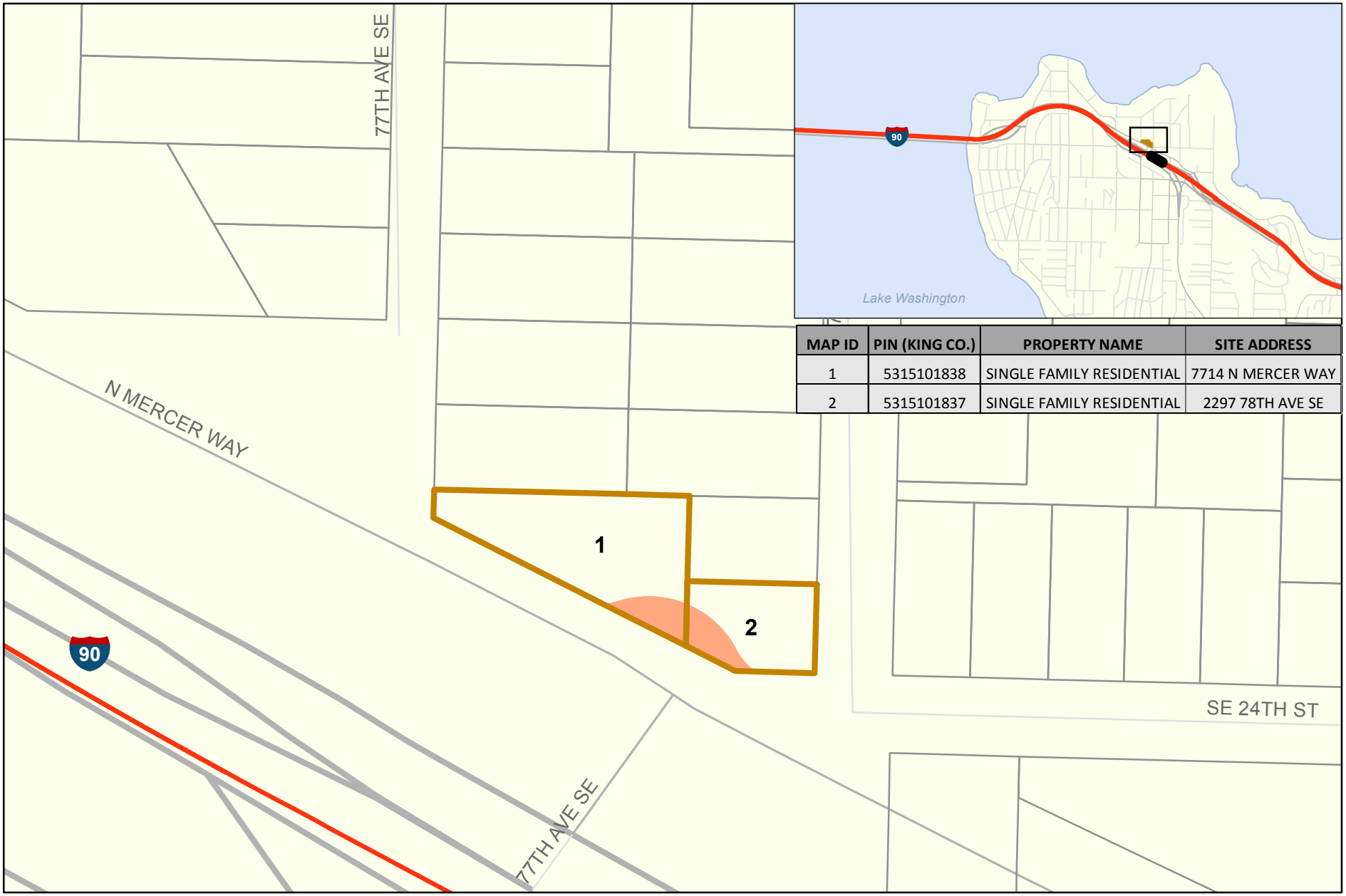
Appendix B
Potentially Affected Parcels



MAP ID	PIN (KING CO.)	PROPERTY NAME	SITE ADDRESS
1	5315101838	SINGLE FAMILY RESIDENTIAL	7714 N MERCER WAY
2	5315101837	SINGLE FAMILY RESIDENTIAL	2297 78TH AVE SE

Potential Area to be Acquired
Potential Affected Parcel
Parcel
Proposed Station
At-Grade Route

N

0 0.5 Mile

Source: Data from King County (2006) modified by CH2M HILL.

Exhibit B-1 **Potentially Affected Parcels**
East Link Project

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Appendix C
Air Quality Results

Air Quality Analysis

PREPARED FOR: Sound Transit

PREPARED BY: CH2M HILL

DATE: March 30, 2017

The transportation analysis for the East Link Project is being updated and has resulted in changes in intersection level of service from what was studied in the 2011 East Link Final Environmental Impact Statement. Because the project area has been identified as a maintenance area for carbon monoxide (CO), a quantitative analysis of the impacts of East Link Project build conditions on air quality was conducted.

Site Selection

A screening analysis was performed to identify which intersections would be adversely affected by the East Link Project. Microscale CO modeling was performed using the WSDOT WASIST model (version 3.0) to estimate existing (2016), construction (2020), and horizon year (2040) CO levels at selected locations. The air quality analysis uses horizon year 2040 instead of 2035, which was used in the transportation analysis, to be consistent with the current long-range plan for the Puget Sound area (Puget Sound Regional Council Transportation 2040, 2010). WASIST uses predefined traffic data to estimate the project-generated CO emissions by inputting a combination of worst-case scenarios, including intersection inputs (i.e., peak-hour traffic volumes, approach speeds, and signal timing) for the five intersections listed below, to produce the highest possible level of CO emissions. Intersections with a level of service (LOS) D or worse would produce traffic congestion that could cause localized hotspots. Traffic data were collected for the project to determine which intersections would meet this criterion and further degrade the LOS from D to E or F under the future build alternatives. Screened intersections meeting this criterion underwent a CO hotspot modeling analysis. Based on the screening methods, the five intersections that require further analysis for potential CO hot spots are:

- 4th Avenue S/Seattle Boulevard S (Seattle)
- 4th Avenue S/S Royal Brougham Way (Seattle)
- Rainier Avenue/S Dearborn Street (Seattle)
- Bellevue Way/112th Avenue SE (Bellevue)
- Bellevue Way/112th Avenue SE/South Bellevue Park-and-Ride (Bellevue)

Quantitative Carbon Monoxide Impact Analysis

Traffic data for the air quality analysis were derived from traffic counts and other information developed as part of an overall traffic analysis. Output from the Synchro8 signal-timing traffic model, including LOS, peak-hour traffic volumes, and lane configurations, was used to evaluate CO impacts. The microscale CO analysis was performed based on data from this analysis for the evening (PM) peak traffic period, which is the period when maximum traffic volumes occur in the project area and when the greatest traffic and air quality impacts are expected. An annual

growth factor of 0.6 percent was added to the 2035 Synchro8 model output to account for 2040 traffic volumes.

The WASIST dispersion model was used to estimate peak 1-hour and 8-hour CO concentrations near the affected intersections. Intersection types were selected from those available in WASIST based on actual intersection geometry, with conservative selections made when an exact match was not available. Receptors were placed at the corners of the intersection, allowing a default buffer of 10 feet in each direction. Additional receptors were placed a further 82 feet beyond the first set in the direction of heaviest traffic flow.

Microscale modeling is used to predict CO concentrations resulting from emissions from motor vehicles, using roadways immediately adjacent to the locations at which predictions are being made. A CO background level must be added to these values to account for CO entering the area from other sources upwind of the receptors. The background 1-hour and 8-hour CO concentrations were estimated using the Northwest AIRQUEST tool by Washington State University (http://lar.wsu.edu/nw-airquest/lookup.html). The 1-hour background CO value for the project area was 2.1 parts per million (ppm), and the 8-hour background value was 1.4 ppm.

The background CO concentrations were added to the respective modeled 1-hour and 8-hour CO impacts due to the project to establish the design values for each of the project intersections. The predicted 1-hour and 8-hour CO design value concentrations at the five intersections evaluated for CO hot spots are presented in Table 1 and Table 2, respectively. As shown, CO concentrations from traffic at the worst-case intersections would not cause or contribute to an exceedance of the 1-hour or 8-hour CO National Ambient Air Quality Standard (NAAQS) of 35 parts per million (ppm) and 9 ppm, respectively.

Mitigation of Carbon Monoxide Impacts

Since the East Link Project would not have an adverse effect on air quality, no mitigation measures are proposed.

Table 1. Modeled 1-Hour Carbon Monoxide Design Values

Intersection	Maximum 1-Hour Carbon Monoxide Design Values (ppm)						
	Existing 2016	No Build 2020	Build 1 2020	Build 2 2020	No Build 2040	Build 1 2040	Build 2 2040
4th Avenue S/Seattle Boulevard S	2.6	2.5	2.7	2.7	2.4	2.4	2.4
4th Avenue S/S Royal Brougham Way	2.7	2.7	2.7	2.7	2.4	2.4	2.4
Rainier Avenue/S Dearborn Street	2.9	2.8	2.8	2.8	2.5	2.5	2.5
Bellevue Way/112th Avenue SE	3.0	2.9	2.9	2.9	2.7	2.7	2.7
Bellevue Way/112th Avenue SE/S Bellevue Park-and-Ride	3.0	2.9	2.9	2.9	2.5	2.5	2.5
NAAQS				35			

Note: Results include a background of 2.1 ppm

Table 2. Modeled 8-Hour Carbon Monoxide Design Values

Intersection	Maximum 8-Hour Carbon Monoxide Design Values (ppm)						
	Existing 2016	**No Build 2020**	**Build 1 2020**	**Build 2 2020**	**No Build 2040**	**Build 1 2040**	**Build 2 2040**
4th Avenue S/Seattle Boulevard S	1.7	1.7	1.8	1.8	1.6	1.6	1.6
4th Avenue S/S Royal Brougham Way	1.8	1.8	1.8	1.8	1.6	1.6	1.6
Rainier Avenue/S Dearborn Street	2.0	1.9	1.9	1.9	1.7	1.7	1.7
Bellevue Way/112th Avenue SE	2.0	2.0	2.0	2.0	1.8	1.8	1.8
Bellevue Way/112th Avenue SE/S Bellevue Park-and-Ride	2.0	2.0	2.0	2.0	1.7	1.7	1.7
NAAQS				9			

Note: Results include a background of 1.4 ppm

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Appendix D
Noise Analysis Memorandum

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Mercer Island Transit Center Noise Analysis

To:	Alisa Swank/CH2M
From:	Michael Minor/Michael Minor & Associates
Project:	East Link Bus/Light Rail Transit System Integration Study
Date:	March 30, 2017

1.0 Summary

This noise analysis was prepared and updated as part of the East Link Bus/Light Rail Transit System Integration study. The intent of the study is to develop and evaluate the potential noise impacts of an integrated King County Metro (Metro), Sound Transit Express bus system, and Sound Transit East Link Extension service at the new Mercer Island Station.

This analysis evaluated two Transit Integration configurations, the 80th Avenue SE Configuration and the 77th Avenue SE Configuration. Potential noise levels from revised transit operations at the Mercer Island Station were evaluated using the 2006 methods from the Federal Transit Administration (FTA) to assure compliance with applicable noise regulations. The evaluation found that future noise levels under the configurations are similar to the existing noise levels in the area. The day-night sound levels (L_{dn}) are not predicted to increase by more than 0 to 1 A-weighted decibels (dBA) L_{dn}. Given that no noise impacts were identified, no project-related noise mitigation is required.

Traffic noise levels were also evaluated under Federal Highway Administration (FHWA) criteria for the 77th Avenue SE Configuration. The results show that there would be only a slight increase in noise levels and no traffic noise impacts are predicted.

2.0 Project Description

The project would integrate the bus routes along I-90 with East Link light rail by creating an area on Mercer Island that allows bus riders to transfer to the light rail system and vice versa. Bus routes traveling on I-90 to and from Eastside communities would terminate at the Mercer Island Station and would no longer go to downtown Seattle.

The 80th Avenue SE Configuration would include bus drop-off and pick-up areas on the western side of 80th Avenue SE and bus layover areas along N Mercer Way and 80th Avenue SE. The 77th Avenue SE Configuration would route buses in a counter-clockwise direction along N Mercer Way from the westbound 80th Avenue SE HOV off-ramp to the 80th Avenue SE HOV on-ramp. The configuration would include roadway improvements, bus drop-off and pick-up areas, and bus layover areas on the west side of 80th Avenue SE and on N Mercer Way.

3.0 Introduction to Noise

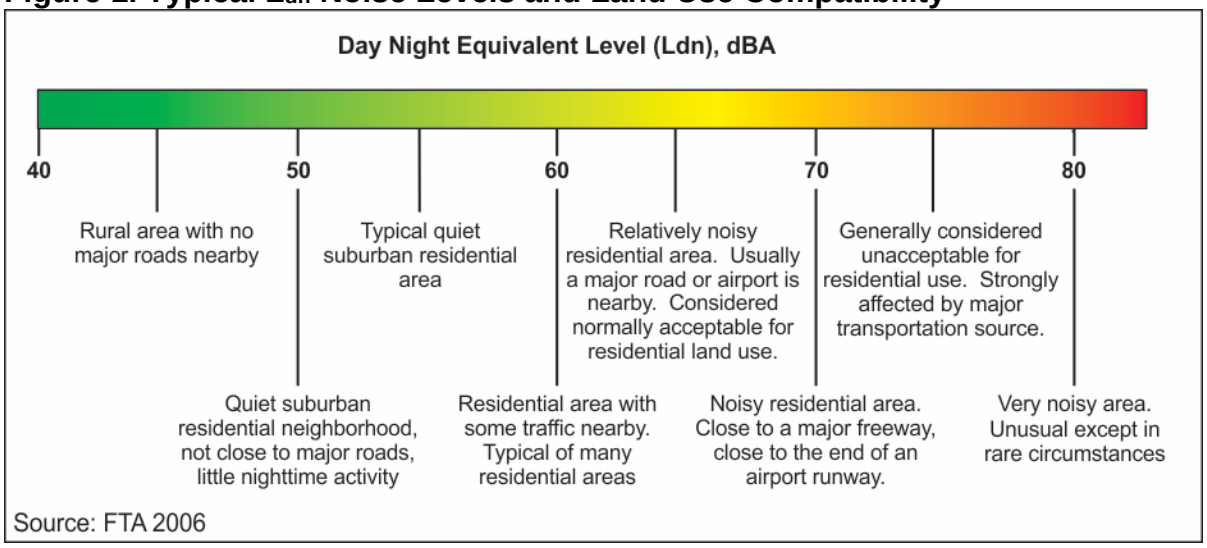
Noise is defined as unwanted sound; it is measured in terms of sound pressure level and is usually expressed in decibels (dB), a conversion of air pressure to a unit of measurement that

represents the way humans hear sounds. The human ear is less sensitive to higher and lower frequencies than it is to midrange frequencies. To provide a measurement meaningful to humans, a weighting system was developed that reduces the sound level of higher and lower frequency sounds, similar to what the human ear does. This filtering system is used in virtually all noise ordinances. Measurements taken with this "A weighted" filter are referred to as "dBA" readings. There are two primary noise measurement descriptors that are used to assess noise impacts from traffic and transit projects, the L_{eq} and the L_{dn}, described below:

- L_{eq}: The equivalent sound level (L_{eq}) is the level of a constant sound for a specified period of time that has the same sound energy as an actual fluctuating noise over the same period of time. The peak-hour L_{eq} is used for all traffic noise analyses and for light rail noise analyses at locations with daytime use, such as schools and libraries.

- L_{dn}: The day-night sound level (L_{dn}) is an L_{eq} over a 24-hour period, with 10 dBA added to nighttime sound levels (between 10 p.m. and 7 a.m.) as a penalty to account for the greater sensitivity and lower background sound levels during this time. The L_{dn} is the primary noise-level descriptor for light rail noise at residential land uses. Figure 1 is a graph of typical L_{dn} noise levels and residential land use compatibility.

Figure 1. Typical L_{dn} Noise Levels and Land Use Compatibility



4.0 Method of Analysis

The proposed project is an FTA project and therefore follows the methods provided by the FTA guidance manual (FTA, 2006). As required by the FTA, other federal, state, and local noise regulations and ordinances were reviewed for relevance to this project. Under the FTA analysis, operational noise levels from buses and vehicles were predicted using measured data and followed the methods outlined by the FTA.

4.1 FTA Noise Regulations

The criteria in the FTA guidance manual are founded on well-documented research on community reaction to noise and are based on change in noise exposure using a sliding scale. The amount that a transit project is allowed to change the overall noise environment is

reduced as levels of existing noise increase. The FTA noise impact criteria group noise-sensitive land uses into the following three categories:

- **FTA Category 1:** Tracts of land where quiet is an essential element in the intended purpose. This category includes lands set aside for serenity and quiet and such land uses as outdoor amphitheaters and concert pavilions, as well as National Historic Landmarks with significant outdoor use. Also included in this category are recording studios and concert halls. There are no Category 1 uses in the project corridor.
- **FTA Category 2:** Residences and buildings where people normally sleep. This category includes homes, hospitals, and hotels where a nighttime sensitivity to noise is assumed to be of utmost importance.
- **FTA Category 3:** Institutional land uses with primarily daytime and evening use. This category includes schools, libraries, theaters, and churches where it is important to avoid interference with such activities as speech, meditation, and concentration on reading material. Places for meditation or study associated with cemeteries, monuments, museums, campgrounds, and recreational facilities are also considered to be in this category. Certain historical sites and parks are also included, but their sensitivity to noise must be related to their defining characteristics, and generally parks with active recreational facilities are not considered noise sensitive.

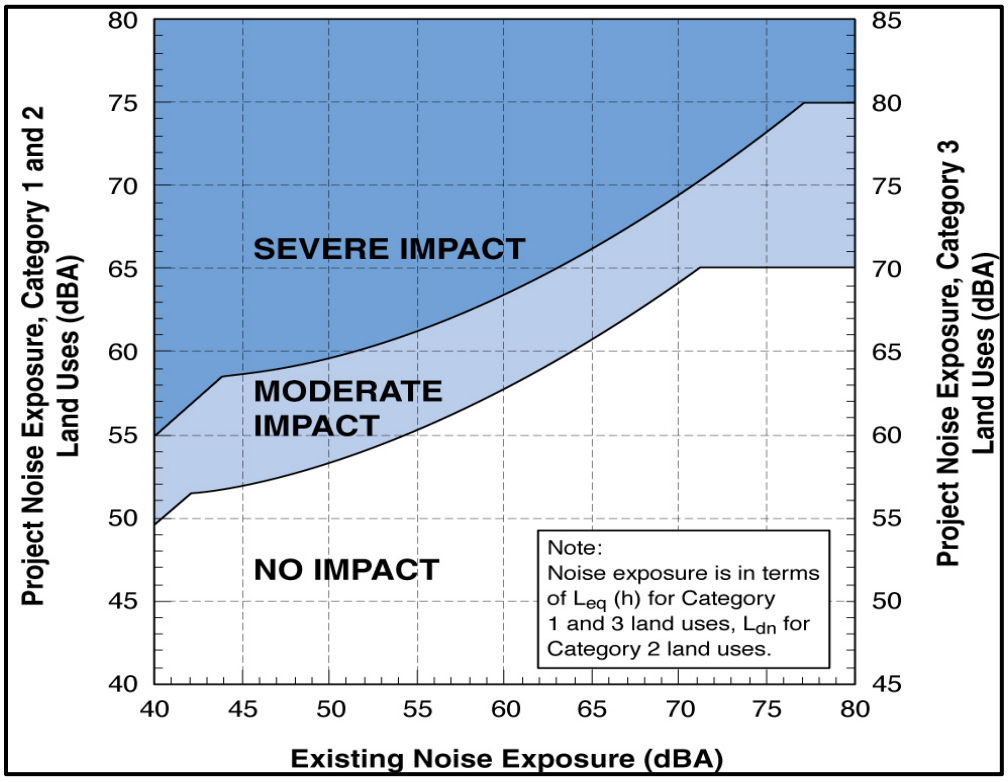
The L_{dn} is used to characterize noise exposure for residential areas (Category 2), and the maximum 1-hour L_{eq} during the period that the facility is being used is used for other noise-sensitive land uses such as school buildings (Category 3).

There are two levels of impact included in the FTA criteria:

- **Severe Impact:** Project-generated noise in the severe impact range can be expected to cause a substantial percentage of people to be highly annoyed by the new noise and represents the most compelling need for mitigation. Noise mitigation will normally be specified for severe impact areas unless there are extenuating circumstances that prevent it from being applied.
- **Moderate Impact.** In this range of noise impact, the change in the cumulative noise level is noticeable to most people but might not be sufficient to cause strong, adverse reactions from the community. In this transitional area, other project-specific factors must be considered to determine the magnitude of the impact and the need for mitigation. These factors include the existing noise level, the predicted level of increase over existing noise levels, the types and numbers of noise-sensitive land uses affected, the noise sensitivity of the properties, the effectiveness of the mitigation measures, community views, and the cost of mitigating noise to more acceptable levels.

Figure 2 summarizes the noise impact criteria for transit operations.

Figure 2. FTA Noise Impact Criteria



Under the FTA criteria, as the existing noise exposure increases, the amount of the allowable increase in the overall noise exposure caused by a project decreases. For example, a residence (FTA Category 2) with an existing L_{dn} of 65 dBA would have an impact if project noise levels equaled or were greater than 61 dBA L_{dn}, and the impact would be considered severe if the project L_{dn} were greater than 66 dBA L_{dn}.

4.2 State Regulations and Local Noise Ordinances

State regulations and local noise ordinances were reviewed for applicability to this project. Under FTA regulations, any project-related traffic noise analysis is performed using the FHWA regulations applicable in the state where the project is being constructed. An FHWA traffic noise study is required for the 77th Avenue SE Configuration because it would shift the roadway and displace two residences that provide shielding. In addition, for stationary noise sources, like the park-and-ride, the local noise control ordinance is used for the noise analysis. Regulations used to evaluate noise impacts for traffic and stationery sources are provided below.

4.2.1 Washington State Traffic Noise Regulations

As required by the FTA, the criteria for determining traffic noise impacts associated with the East Link Extension are taken from the FHWA Procedures for Abatement of Highway Traffic Noise and Construction Noise, Code of Federal Regulations (CFR) Title 23, Part 772 (2010). A traffic noise impact occurs if predicted traffic noise levels approach the criteria levels for specific FHWA land use activity categories or substantially exceed existing noise levels (e.g., a 10-dbA increase). These levels are defined as noise abatement criteria (NAC), and are based on hourly Leq noise levels during the peak traffic noise hour. The land use

activity categories of concern for this analysis are FHWA Type B, which include single- and multi-family residences. The noise abatement criterion used to determine impacts at a residence is to approach, or exceed, 67 dBA Leq outside of buildings. Under WSDOT policy (WSDOT, 2011), a traffic noise impact occurs if predicted noise levels approach within 1 dB of the NAC. Therefore, an impact on Type B or C land uses would occur at 66 dBA Leq.

4.2.2 Local Noise Control Ordinance

In Chapter 173-60 of the Washington Administrative Code (WAC), the Washington State Department of Ecology has adopted Maximum Environmental Noise Levels for residential, commercial, industrial, and construction areas. However, WAC 173-60-110 states that:

> *The department conceives the function of noise abatement and control to be primarily the role of local government and intends actively to encourage local government to adopt measures for noise abatement and control. Wherever such measures are made effective and are being actively enforced, the department does not intend to engage directly in enforcement activities.*

The City of Mercer Island has a community nuisance control code in Chapter 8, Section 24, of its municipal code; however, this code does not provide performance standards that could be used to evaluate noise from transit operations. Therefore, the nuisance code is not applicable to this project and the study uses the WAC provisions. There are no other noise regulations that are applicable to the proposed operations.

WAC Chapter 173-60 (Maximum Environmental Noise Levels) defines three classes of property usage, called Environmental Designation for Noise Abatement (EDNA), and states maximum allowable noise levels for each, as shown in Table 5-1. For example, the noise caused by a Class B EDNA property must be 57 dBA or less at the closest Class A EDNA property line. From 10:00 p.m. to 7:00 a.m., the allowable maximum sound levels shown in Table 5-1 are reduced by 10 dBA for receiving properties in Class A EDNAs. The WAC contains short-term exemptions to the property line noise standards in Table 5-1 based on the minutes per hour that the noise limit is exceeded. These exceedances are outlined in Table 5-2.

Table 5-1. Washington State Noise Control Regulation

Property Producing Noise (EDNA)	Maximum Permissible Sound Level (dBA) Property Receiving Noise (EDNA)[a]		
	Class A EDNA	Class B EDNA	Class C EDNA
Class A	55	57	60
Class B	57	60	65
Class C	60	65	70

[a] Between 10 p.m. and 7 a.m., the levels given above are reduced by 10 dBA in Class A EDNAs.
dBA = decibel with A-weighting

Table 5-2. Washington State Exemptions for Short-Term Noise Exceedances

Minutes Per Hour	Adjustment to Maximum Sound Level
15	+5 dBA
5	+10 dBA
1.5	+15 dBA

dBA = decibel with A-weighting

WAC Construction Noise Criteria

Sounds received in Class A EDNAs that originate from construction sites are exempt from the limits of the WAC regulations during normal daytime hours (7:00 a.m. to 10:00 p.m.). If construction is performed during the nighttime, the contractor must still meet the WAC noise-level requirements for sounds received in Class A EDNAs, as presented in Table 5-1, or get a noise variance from the governing jurisdiction.

The WAC also contains a set of construction-specific allowable noise-level limits. These construction noise regulations are organized by type of noise and, among other things, include haul trucks and back-up safety alarm criteria.

Haul Truck Noise Criteria

Maximum permissible sound levels for haul trucks on public roadways are limited to 86 dBA for speeds of 35 miles per hour (mph) or less, and 90 dBA for speeds over 35 mph when measured at 50 feet (Chapter 173-62, WAC). For trucks operating within staging areas, the general construction equipment noise criteria would be used to determine compliance during nighttime hours in Class A EDNAs.

Noise Related to Back-up Alarms

Sounds created by back-up alarms are essentially prohibited by the WAC during nighttime hours (10:00 p.m. to 7:00 a.m.) in Class A EDNAs, when other forms of back-up safety measures would need to be used. These could include the use of smart back-up alarms, which automatically adjust the alarm level based on the background level, or switching off back-up alarms and replacing them with spotters.

4.3 Source Data

Data used for the noise study included computer drafting files, plan and profile drawings, operational hours, bus volumes and existing and future local area traffic volumes, speeds, and vehicle mixture. The data used in the analysis were obtained from CH2M and Sound Transit. Measured noise levels of typical buses in normal operation from the FTA were used as reference noise levels in the noise models.

A noise analysis for this type of project is typically performed in three distinct steps:

1. FTA noise impact criteria are determined using existing measured noise levels and the land use of potentially affected properties. The FTA noise impact criteria are determined as described in Section 5.1. The WAC criteria are determined as described in Section 5.2; all of the receiving properties in this study fall into the Class A EDNA.
2. Future operational noise levels are calculated for nearby noise-sensitive uses. Potential noise impacts are then identified.
3. If impacts are identified, noise mitigation is examined.

5.0 Area Land Use and Existing Noise Levels

The current land use is used to determine the noise analysis category under the FTA criteria. Land use near the proposed facility includes single-family residential uses to the north of the park-and-ride, with mixed multifamily and commercial uses located to the south of I-90. There is a large condominium complex east of the park-and-ride, and there are paths and

green space on the I-90 lid, along with the Mercer Island Community and Event Center located to the northeast of the park and ride.

I-90 runs in the middle of the study area and is depressed in a cut approximately 30 to 40 feet below grade, reducing noise from the highway at most residences in the area. Figure 3 provides an overview of the proposed facility and shows the closest noise-sensitive land uses.

5.1 Ambient Noise Monitoring

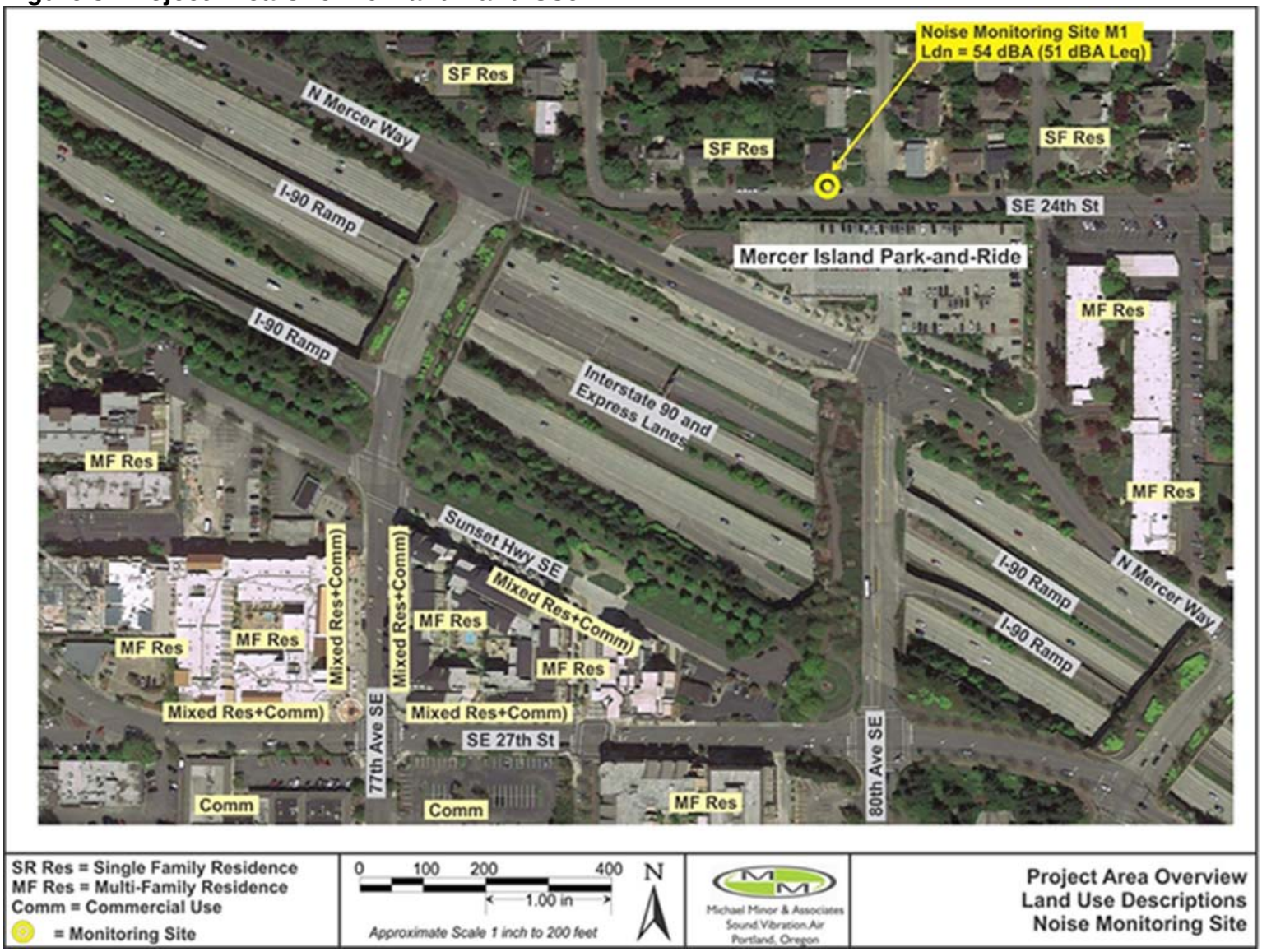
The detailed noise analysis under the FTA guidance manual (FTA, 2006) requires existing noise level measurements in the study area. Noise levels were measured at site M1, 2257 80th Avenue SE, a single-family residence directly north of the existing park-and-ride facility (see Figure 3). Supplemental noise measurements at West Mercer Way Lid Park and near the east end of Mercer Island at 3700 E Mercer Way were also reviewed and used to establish the existing noise levels in the vicinity.

All noise measurements were taken in accordance with the American National Standards Institute (ANSI) procedures for community noise measurements. The sound level meters were calibrated before and after each measurement period using a sound level calibrator. System calibration is traceable to the National Institute of Standards and Testing (NIST). The systems meet or exceed the requirements for an ANSI Type 1 noise measurement system.

The measured existing noise environment was dominated by traffic noise, including existing buses, from N Mercer Way and other nearby arterial roadways. Noise from I-90 was audible but not generally a major contributor. Noise levels at residences to the west of the park-and-ride are predicted to be slightly higher than those at site M1 due to traffic noise from the I-90 ramps, N Mercer Way, and the commercial activities along SE 27th Street. Noise levels at residences located south of I-90 are also predicted to have slightly higher noise levels due to the added traffic related to the commercial activities in the town center.

The L_{dn} noise level at measurement site M1 was 54 dBA, with peak-hour (5:00 to 6:00 p.m.) noise levels of 51 dBA L_{eq}. Noise levels for homes directly adjacent to N Mercer Way, and along Sunset Highway SE are predicted to be 65 dBA L_{dn}, with peak-hour L_{eq} noise levels of 65 dBA.

Figure 3. Project Area Overview and Land Use



6.0 Operational Noise Impact Analysis

This section provides the results of the noise study. For the 80th Avenue SE configuration, the only noise sources are the buses moving and laying over at the Mercer Island Station. Under the 77th Avenue SE Configuration, the analysis also includes a traffic noise study for the new roundabout at the "T" intersection of 77th Avenue SE and N Mercer Way.

Operational noise levels were predicted and used to identify potential noise impacts under the FTA and WAC criteria. The typical 24-hour L_{dn} was used for compliance with the FTA regulations. The 24-hour L_{dn} was projected using the methods described by the FTA (FTA, 2006). The L_{eq} was used for compliance with the WAC.

The analysis used the total number of buses accessing the site during daytime and nighttime hours to predict the operational L_{dn} at each receiver of interest. Input to the model assumed 358 buses per day, with 318 buses during daytime hours and 40 buses during nighttime hours. Although current projections are closer to 305 daytime and 15 nighttime, buses using the higher numbers with the notable increase in nighttime buses assured a conservative analysis and allows for incremental increases in service.

Note that under the FTA criteria, it is possible to have a noise impact even when project levels are lower than the existing noise levels. For example, as shown in Figure 2, the moderate impact criterion for a receiver with an existing noise level of 65 dBA L_{dn} is a 61 dBA L_{dn} project noise level.

Eight representative noise-sensitive receivers near the proposed bus layovers and travel routes were selected for the noise analysis. These would be the closest receivers to those areas with added noise that would have the potential for noise impacts. Receiver R1 represents the residences located north of the project area near the intersection of 77th Avenue SE and N Mercer Way. Receivers R2 and R3 represent residences behind the park-and-ride on SE 24th Street. Receiver R3 is the same site as monitoring site M1 (see Figure 3). Receivers R4 through R7 represent the multifamily residences located south of I-90, along Sunset Highway SE. With the 77th Avenue SE Configuration, Receiver R1 would be displaced due to installation of the roundabout. Therefore, a new receiver located directly behind R1 was included in the FTA and WAC analysis for the 77th Avenue SE Configuration. The receiver is denoted T1 and was also used in the traffic analysis.

6.1 80th Avenue SE Configuration Transit Noise Analysis

Existing and future noise levels were projected for the R1 to R7 receiver locations using the data from the onsite noise measurements and standard acoustical formulas. These receivers are shown on Figure 4.

Figure 4. 80th Avenue SE Configuration Noise Modeling Sites

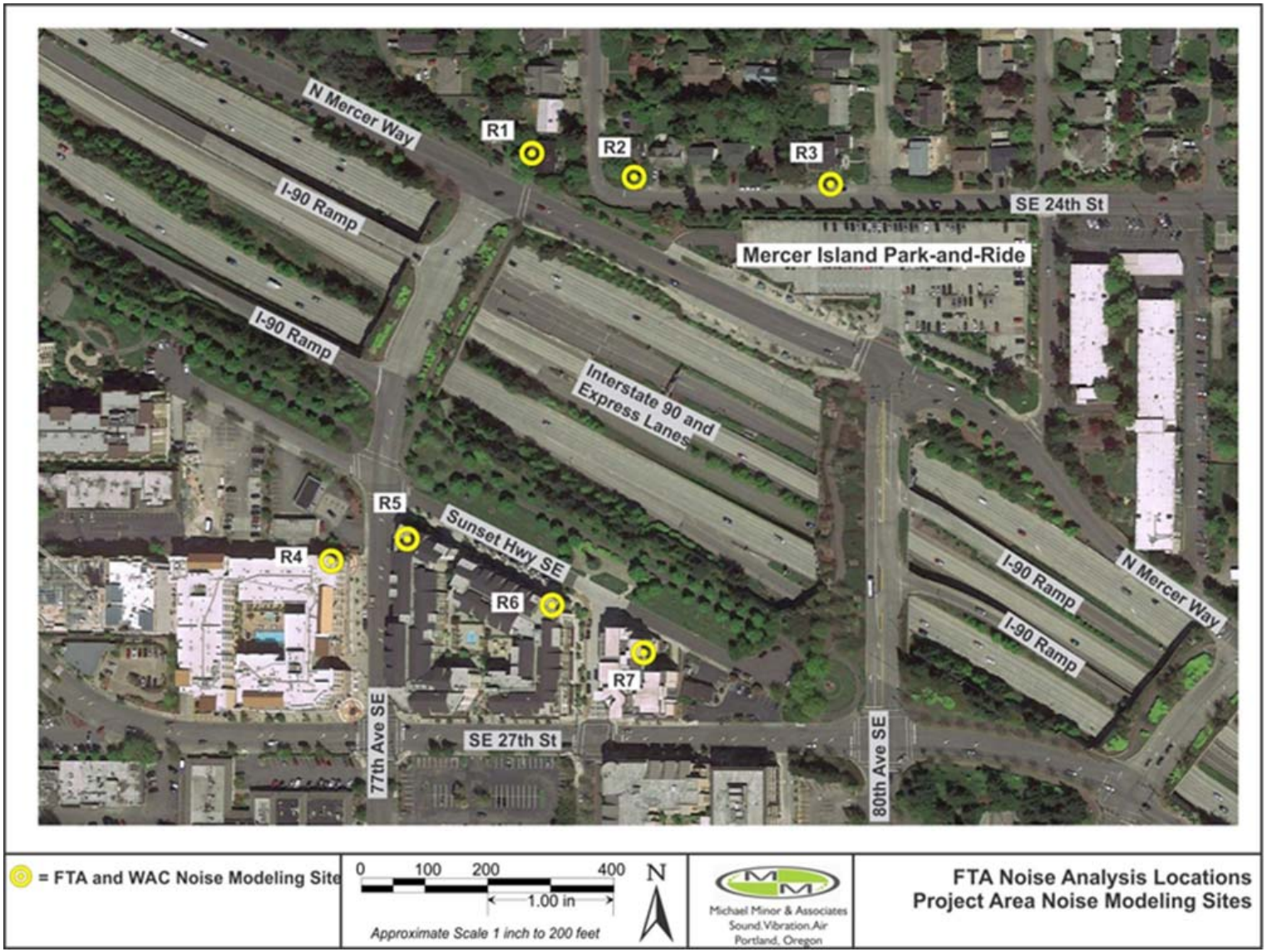


Table 6-1 compares the results of the FTA analysis projections with the predicted existing L_{dn}. It is important to note that the "Station Noise Level (dBA L_{dn})" in Table 6-1 is the noise from bus transit operations only and does not include other noise sources. The 80th Avenue SE Configuration noise levels were compared to the FTA criteria (which are based on the existing noise levels). If the project criteria met or exceeded the FTA criteria, noise impacts would be identified and mitigation would need to be investigated. Table 6-1 also includes the results of the WAC analysis, under which the maximum allowable nighttime sound level is 47 dBA. No noise impacts are predicted under the FTA or WAC criteria.

Table 6-1. 80th Avenue SE Configuration Noise Level Impact Analysis *(24-hour L_{dn} and peak-hour L_{eq} impact analysis)*

Receiver[a]	Existing Noise Level (dBA L_{dn})[b]	Station Noise Level (dBA L_{dn})[c]	FTA Criteria (dBA)[d]		WAC Analysis (dBA L_{eq})[e]	Impact (WAC/FTA)[f]
			Moderate	Severe		
R1	65	49	61	65	41	No/No
R2	63	50	60	64	42	No/No
R3	54	50	55	62	42	No/No
R4	64	46	61	65	38	No/No
R5	65	47	61	65	39	No/No
R6	62	48	59	64	40	No/No
R7	61	49	59	64	41	No/No

[a] Receiver locations are shown on Figure 4.
[b] Predicted 24-hour L_{dn} dBA.
[c] Calculated 24-hour L_{dn} from transit operations only.
[d] FTA impact criteria from Figure 2.
[e] Peak-hour Leq for analysis, typically between 6:00 and 7:00 a.m. (maximum allowable sound level = 47 dBA nighttime).
[f] Impacts identified using WAC and FTA criteria.

6.2 77th Avenue SE Configuration Noise Impact Analysis

6.2.1 Transit Noise Analysis

Receivers R2 to R7 were used for the 77th Avenue SE Configuration transit noise impact analysis as shown on Figure 5. Noise modeling results for the WAC and FTA noise analysis were compiled as shown in Table 6-2. No noise impacts are predicted under the FTA or WAC criteria.

Figure 5. 77th Avenue SE Configuration Noise Modeling Sites

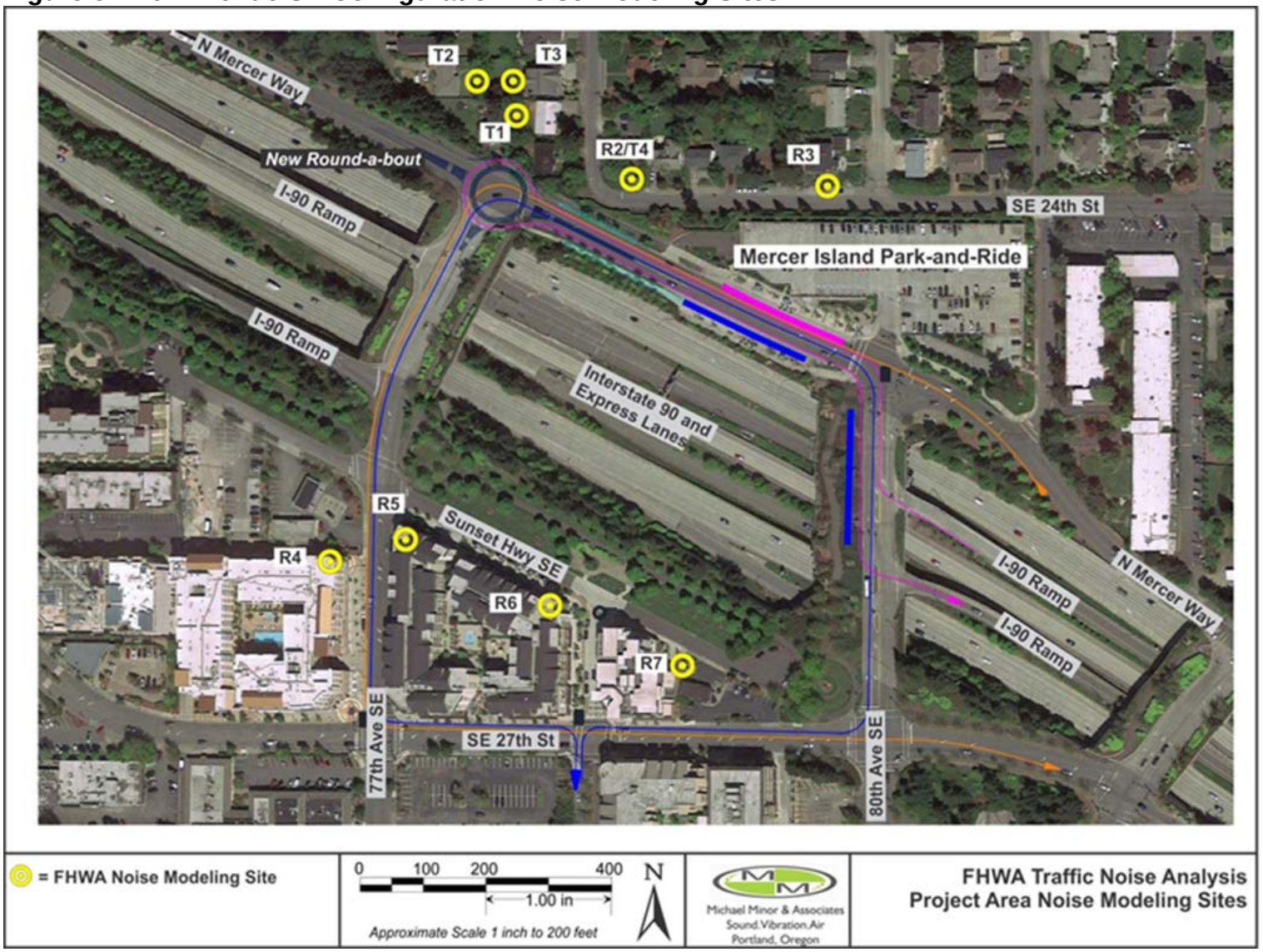


Table 6-2. 77th Avenue SE Noise Level Impact Analysis *(24-hour L_{dn} and peak-hour L_{eq} impact analysis)*

Receiver[a]	Existing Noise Level (dBA L_{dn})[b]	Station Noise Level (dBA L_{dn})[c]	FTA Criteria (dBA)[d]		WAC Analysis (dBA L_{eq})[e]	Impact (WAC/FTA)[f]
			Moderate	Severe		
T1	60	51	60	64	43	No/No
R2/T4	63	50	60	64	42	No/No
R3	54	46	55	62	38	No/No
R4	64	47	61	65	39	No/No
R5	65	47	61	65	39	No/No
R6	62	48	59	64	40	No/No
R7	61	47	59	64	39	No/No

[a] Receiver locations are shown on Figure 5.
[b] Predicted 24-hour L_{dn} dBA.
[c] Calculated 24-hour L_{dn} from transit operations only.
[d] FTA impact criteria from Figure 2.
[e] Peak-hour Leq for analysis, typically between 6:00 and 7:00 a.m. (maximum allowable sound level = 47 dBA nighttime).
[f] Impacts identified using WAC and FTA criteria.

6.2.2 Traffic Noise Analysis

The 77th Avenue SE Configuration (Figure 5) requires an FHWA traffic noise analysis because the roundabout would shift travel lanes closer to residences on the north side of N Mercer Way. In addition, construction of the roundabout would remove two existing residences that serve as barriers to roadway noise for the residences behind them. The FHWA modeling was only performed for the receivers that would be directly affected by the roundabout, identified as receivers T1 through T4 on Figure 5.

Traffic noise levels were modeled using a validated FHWA Traffic Noise Model (TNM version 2.5). The modeling was performed for the existing conditions and the future year 2035 build conditions and assumed Option 2 for I-90 Operations to be conservative. The results, provided in Table 6-3, show that there is only a slight increase in noise levels and no traffic noise impacts are predicted.

Table 6-3. 77th Avenue SE Traffic Noise Level Impact Analysis

Receiver[a]	WSDOT Noise Criteria (dBA L_{eq})	Existing Conditions Traffic Noise (L_{eq} dBA)	77th Avenue SE Configuration Traffic Noise (L_{eq} dBA)[b]	Traffic Noise Impacts[c]
T1	66	56	57	No
T2	66	55	56	No
T3	66	57	57	No
T4	66	57	58	No

[a] Receiver locations are shown on Figure 5.
[b] Peak-hour Leq for traffic noise analysis.
[c] Impacts identified using FTA criteria.

7.0 Construction Noise

Construction noise levels would result from normal construction activities associated with building the project on Mercer Island. Noise levels for these activities can be expected to range from 70 to 95 dBA at sites 50 feet from the activities. These noise levels, although temporary in nature, can be annoying. Sound Transit's Light Rail Noise Mitigation Policy (Motion No. M2004-08) states that construction noise levels and impacts should meet applicable noise regulations and ordinances. Most daytime construction noise activities would be exempt from the local noise control ordinance. When required, Sound Transit or its contractor would seek the appropriate noise variance from the local jurisdiction. Typical mitigation measures that could be applied are presented below and contractors would be required to meet the criteria in the city noise ordinance.

Noise-control mitigation might include the following measures, as necessary, to meet required noise limits:

- During nighttime work, use smart back-up alarms that automatically adjusts or lowers the alarm level or tone based on the background noise level, or switch off back-up alarms and replace with spotters.
- Use low-noise-emission equipment.
- Conduct monitoring and maintenance of equipment to meet noise limits.
- Use acoustic enclosures, shields, or shrouds for equipment and facilities.
- Minimize the use of generators or use whisper-quiet generators to power equipment.
- Implement noise-deadening measures for truck loading and operations.
- Prohibit aboveground jack-hammering and impact pile-driving during nighttime hours.
- Minimize the use of generators or use whisper-quiet generators to power equipment.
- Limit use of public address systems.
- Limit or avoid certain noisy activities during nighttime hours.

8.0 Conclusion

The Mercer Island Transit Integration configurations are not predicted to result in transit or traffic noise impacts at any of the nearby noise-sensitive land uses. No mitigation is needed.

APPENDIX A

References

23 CFR 772. *Procedures for Abatement of Highway Traffic Noise and Construction Noise,* U.S. Department of Transportation.

FTA. 2006. *Transit Noise and Vibration Impact Assessment*. Federal Transit Administration, U.S. Department of Transportation.

WSDOT. 2011. *Traffic Noise Policy and Procedure Manual*.

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Appendix E
WSDOT Section 4(f) Memorandum

Washington State Department of Transportation

Public Transportation Division
401 2nd Avenue South, Ste 300
Seattle, WA 98104
206-464-1260 / Fax: 206-464-1286
TTY: 1-800-833-6388
www.wsdot.wa.gov

August 8, 2016

James Irish
Deputy Director
Environmental Affairs and Sustainability Office
Sound Transit
401 South Jackson Street
Seattle, WA 98104

RE: East Link Extension Project
Section 4(f) Use of Air Space Leased Interstate 90 Right-of-Way

Dear James,

The Washington State Department of Transportation (WSDOT) understands that Sound Transit, for the East Link Extension project, intends to use right-of-way properties currently under air space lease by the City of Bellevue, City of Mercer Island, and the City of Seattle respectively, for construction staging and construction activities. This letter affirms the use of Interstate 90 (I-90) right of way properties adjacent to or associated with the park properties listed below, for construction staging and construction activities by Sound Transit does not constitute Section 4(f) use.

- Enatai Beach Park, Bellevue
- Audrey Davis Park, Mercer Island
- Mercer Island Boat Launch
- Judkins Park, Seattle
- East Portal Viewpoint, Seattle

There are two principle reasons why Section 4(f) use does not occur in this case.

First, WSDOT purchased land from Section 4(f) properties as permanent transportation right-of-way for I-90 using Federal-aid funds. By this action, as documented in the 1978 SR 90 - Junction SR 5 to Vicinity Junction SR 405 Record of Decision, measures were implemented to mitigate for Section 4(f) use, per 23 C.F.R. 774.17. Now, as permanent right-of-way, the use of the premises cannot be considered the use of publicly owned land from a public park, recreation area, or wildlife and waterfowl refuge within the meaning of 23 U.S.C. 138 and 49 U.S.C. 1653(f).

Second, WSDOT's air space lease agreements with the cities of Seattle, Mercer Island, and Bellevue allow use of the respective I-90 right-of-way properties as park or open space on a temporary basis. Each lease agreement includes terms to return the property upon request to WSDOT for transportation or highway purposes. As similarly stated above, the subsequent use of the premises within the meaning of 23

U.S.C. 138 and 49 U.S.C. 1653(f) cannot be considered the use of publicly owned land from a public park, recreation area, or wildlife and waterfowl refuge.

If there are further questions, please contact Dylan Counts at 206-464-1232, or by email at CountsD@wsdot.wa.gov.

Sincerely,

John White, P.E.
Assistant Regional Administrator
SnoKing Design

MT:mt

cc: Perry Weinberg, Sound Transit
Lindsey Handel, FHWA
Dylan Counts, WSDOT

Appendix F
Section 106

Allyson Brooks Ph.D., Director
State Historic Preservation Officer

December 5, 2016

Mr. John Witmer
Federal Transit Administration
915 Second Avenue
Federal Building, Suite 3142
Seattle, WA 98174-1002

In future correspondence please refer to:
Project Tracking Code: 090806-11-FTA
Property: East Link Project, Seattle to Bellevue to Redmond
Re: NOT Eligible, Continued Adverse Effect

Dear Mr. Witmer:

Thank you for contacting the Washington State Historic Preservation Officer (SHPO) and Department of Archaeology and Historic Preservation (DAHP). Your expanded area of potential effect (APE) has been reviewed on behalf of the SHPO under provisions of Section 106 of the National Historic Preservation Act of 1966 (as amended) and 36 CFR Part 800. Our review is based upon documentation contained in your communication.

DAHP has no comment on the expanded APE for the project. Of the fourteen properties that were submitted to our agency for review by Ms. Durio, DAHP concurs with your determination that none of the properties is eligible for listing in the National Register of Historic Places (NRHP). As a result of our concurrence, further contact with DAHP on this matter is not necessary. However, if new information on the property becomes available and/or if the project scope of work or location changes significantly, please resume consultation as our assessment may be revised. We also concur that the project maintains a determination of adverse effect, a determination that has been mitigated through a memorandum of agreement.

Thank you for the opportunity to review and comment. If you have any questions, please feel free to contact me.

Sincerely,

Matthew Sterner, M.A.
Transportation Archaeologist
(360) 586-3082
matthew.sterner@dahp.wa.gov

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