# LIGHT RAIL PERMITTING
# ADVISORY COMMITTEE MEETING

**Date**: November 14, 2014

**To:** Light Rail Permitting Advisory Committee

**From:** Matthews Jackson (425-452-2729, mjackson@bellevuewa.gov)
Carol Helland (425-452-2724, chelland@bellevuewa.gov )
*Liaisons to the Advisory Committee*
*Development Services Department*

**Subject:** November 19th, 2014 Advisory Committee Meeting

Enclosed you will find an agenda packet for your twenty-second Advisory Committee meeting next Wednesday, November 19th. We will begin at 3:00 p.m. in Room 1E-113 at Bellevue City Hall. The meeting will be chaired by Doug Mathews and Marcelle Van Houten.

This packet includes:

1. Agenda
2. October 29th Meeting Minutes
3. City PowerPoint from October 29th CAC Meeting
4. Sound Transit South Bellevue Open House Boards
5. Sound Transit South Bellevue Noise Impact Assessment Using Bellevue City Code-Operations

We will have hard copies of all electronic packet materials for you on November 19th. Materials will also be posted on the City's project web site at http://www.bellevuewa.gov/light-rail-permitting-cac.htm.

Please let us know if you have any questions prior to our meeting. We look forward to seeing you next week.

# LIGHT RAIL PERMITTING
# ADVISORY COMMITTEE MEETING

Wednesday, November 19th, 2014
3:00 p.m. – 5:00 pm • Room 1E-113
Bellevue City Hall • 450 110th Ave NE

# AGENDA

| | | |
|---|---|---|
| **3:00 p.m.** | **1.** | **Call to Order, Approval of Agenda, Approval of October 29th Meeting Minutes**<br>*Committee Co-Chairs Mathews and Van Houten* |
| **3:10 p.m.** | **2.** | **Public Comment**<br>*Limit to 3 minutes per person* |
| **3:20 p.m.** | **3.** | **Sound Transit Open House Recap**<br>*Sound Transit and CAC* |
| **4:00 p.m.** | **4.** | **South Bellevue Noise Impact Assessment - Operations**<br>*Sound Transit* |
| **4:50 p.m.** | **5.** | **Public Comment**<br>*Limit to 3 minutes per person* |
| **5:00 p.m.** | **6.** | **Adjourn** |

Project web site located at: http://www.bellevuewa.gov/light-rail-permitting-cac.htm . For additional information, please contact the Light Rail Permitting Liaisons: Matthews Jackson (425-452-2729, mjackson@bellevuewa.gov ) or Carol Helland (425-452-2724, chelland@bellevuewa.gov ). Meeting room is wheelchair accessible. American Sign Language (ASL) interpretation available upon request. Please call at least 48 hours in advance. Assistance for the hearing impaired: dial 711 (TR).

CITY OF BELLEVUE
LIGHT RAIL PERMITTING
ADVISORY COMMITTEE
MEETING MINUTES

October 29, 2014 Bellevue City Hall
3:00 p.m. Room 1E-113

| | |
|---|---|
| MEMBERS PRESENT: | Doug Mathews, Marcelle Van Houten, Erin Derrington, Joel Glass, Wendy Jones, Ming-Fang Chang, Don Miles, Siona van Dijk |
| MEMBERS ABSENT: | Susan Rakow Anderson |
| OTHERS PRESENT: | Matthews Jackson, Department of Development Services; Kate March, Department of Transportation; Paul Cornish, John Walser, Justin Lacson, Kati Saunders, John Logan, Sound Transit |
| RECORDING SECRETARY: | Gerry Lindsay |

1. CALL TO ORDER, APPROVAL OF AGENDA, APPROVAL OF MINUTES

The meeting was called to order at 3:04 p.m. by Co-Chair Van Houten who presided.

The agenda was approved by consensus.

A motion to approve the minutes of the October 15, 2014, meeting was made by Co-Chair Mathews. The motion was seconded by Ms. Derrington and it carried unanimously.

2. PUBLIC COMMENT - None

3. TREE PRESERVATION AND CONTEXT SENSITIVE DESIGN CONTINUED DISCUSSION

Justin Lacson with Sound Transit reminded the Committee members that the tree assessment was conducted by the Ms. Leslie design team during the winter of 2013-2014. All trees with a diameter of four inches and greater at chest height were accounted for within 50 feet on either side of the guideway centerline. The work included an inventory of tree species and health. All trees and stumps will be removed from the safe operations and maintenance area, which is 34 feet on either side of the guideway centerline. Additionally, the trees and vegetation in the 30-foot tree evaluation zone extending out from the outer edge of the safe operations and maintenance area were assessed to assure they will not cause a hazard to the overhead catenary system. Once a contractor is on board, there will be an additional inventory of the trees.

Answering a question asked by Co-Chair Mathews, John Logan with Sound Transit said

within the 30-foot tree evaluation zone non-hazard trees and trees not impacted by construction activity will be retained. Where needed, some limbing may be done.

Mr. Miles asked what the response of Sound Transit will be where a tree in the 30-foot tree evaluation zone is actually located on private property. Mr. Logan said it was his understanding that all of the necessary properties will be acquired by Sound Transit. Mr. Lacson said Sound Transit will use eminent domain only as a last recourse.

Ms. Derrington asked how hazard trees are defined. Ms. Saunders said hazard trees were identified by the arborist as part of the tree assessment survey. The trees were all assessed as being excellent, good, fair or hazard. Some additional trees may be classified as hazards if construction will impact a significant portion of their root system. Mr. Lacson added that the determination of whether a tree is a hazard or not is done following the guidelines established by the ISE. Ms. Saunders said no trees will be retained within 34 feet on either side of the centerline of the guideway, but trees removed from the tree evaluation zone will be replanted and located to make sure their mature canopy will not interfere with the train. Shrubs will be planted in the evaluation as well.

John Walser with Sound Transit said Sound Transit does have eminent domain authority, except for over other state agencies, such as Washington State Department of Transportation. He said he was not aware of any scenario along the rail line where a tree on private property may need to be removed. Mr. Miles said the Committee believes there may be some. Mr. Walser said he was aware of discussions concerning properties at the northern end of 112th Avenue NE and the city-created 30-foot buffer zone beyond the guideway. There are slivers of properties that have gone back and forth relative to Sound Transit's obligation to acquire them. In some cases agreements may be reached with the private property owners to maintain their trees in a way that will not interfere with the train.

Ms. Jones highlighted the need to clearly understand if there are trees on private property along 112th Avenue NE that may need to be removed. She pointed out that long ago the City Council made it clear that there will be no partial property takes. Mr. Logan said he did not believe that there are any private property parcels that would be acquired specifically to allow for tree removal.

Co-Chair Van Houten asked if there will be monitoring of the trees in the evaluation zone as construction proceeds. Ms. Saunders said the contractor will install the protection fencing and there will be tree monitoring over the years of construction. Mr. Jackson added that part of the City's review and approval of the clearing and grading permit will include the tree protection plan. City inspectors will make sure everything is in place prior to any work being done and will continue providing oversight.

Mr. Logan noted that after the project is done there will continue to be a level of monitoring for all of the landscaping installed. Mr. Lacson added that there will be field ecologists on site during construction.

Mr. Jackson reminded the Committee that the number of trees involved is very large. He noted that some of the trees listed by Sound Transit as mitigation for deciduous trees are not what the city considers trees for that purpose, such as vine maple. He said the Committee also had questions about what things will look like currently, what things will look like when cleared, and what things will look like when first planted and then 10 and 20 years out.

Mr. Lacson commented that along the E-320 corridor between I-90 and about 500 feet south of the proposed East Main station the inventory counted 2196 trees within the 100-foot swath centered on the guideway centerline. Of those, 1279 trees will need to be removed to construct the project. The number of trees proposed to be replanted along the corridor and at the South Bellevue station totals 595. At the mitigation site, 722 coniferous trees and 8262 deciduous trees will be planted.

Ms. Saunders said the tree assessment survey included all trees within the site area with a diameter of four inches and above, including vine maples and hawthorns. The proposed replacement trees were identified based on existing conditions and include live stake willows which grow robustly. The design team feels strongly that the mature canopy of the willows will contribute to the forested condition at the Sweyolocken mitigation site. Mr. Logan added that live stake willows have a very high success rate.

Ms. Saunders informed the Committee that there has been some movement relative to tree sizing since the last update. The design team working with city staff agreed to upsize from two-gallon to the five-gallon size 25 percent of the trees that will be planted at the mitigation site. It has been proven that smaller plantings are more successful; they have a higher survival rate, grow more quickly and reach maturity faster. The decision to use smaller plant materials at the mitigation site was primarily made with an eye on meeting the performance standard.

Mr. Glass asked if he was correct in understanding that of the 9579 trees to be planted, 595 will be outside of the Sweyolocken mitigation site. Ms. Saunders said that is right. She noted that in addition to Sweyolocken there are mitigation landscapes along much of the E-320 corridor. Mr. Jackson said there is a lot of mitigation on the west side of 112th Avenue SE and along Bellevue Way in the Mercer Slough Park. He said there is a level of mitigation required for the critical area impacts and the city has planting templates applicants must adhere to as a minimum standard. The proposal by Sound Transit meets that standard. There is also mitigation for neighborhood impacts along the alignment that do not follow specific templates and may have different goals. While smaller plants might grow faster, particularly in the mitigation sites, they may not meet the goals to be achieved for the neighborhood context piece.

Ms. Saunders shared with the Committee the pallet of trees developed for the South Bellevue station. She noted that while not exactly the same as the mitigation pallet, many of the same trees are on the mitigation pallet.

Mr. Glass asked for a breakdown of what will be planted in the Sweyolocken mitigation

site and what will be planted generally along the corridor, and how many will follow the South Bellevue station pallet. Ms. Saunders explained that there is a difference in the size of trees that will be planted in the mitigation landscapes and the corridor landscapes. Of the overall pallet of trees, many will overlap, but the corridor landscape trees will all go in at a larger size with calipers between one and a half and three inches, which will translate into trees between seven and twelve feet tall. Mr. Logan said he did not have a breakdown of the quantity of mitigation plants but did have a breakdown for the corridor plantings in relation to the mitigation plants. He said the corridor plantings will mostly be on the eastern side of the alignment between Bellevue Way and 112th Avenue SE and the actual alignment of the light rail. On the west side of that is where the mitigation planting will occur. From 112th Avenue SE the view will be through the taller trees to the alignment and the mitigation plantings beyond.

Mr. Glass said on its face the planting plan looks good, but he said he still did not have a good feel for the numbers. Mr. Lacson said he would work to develop a more accurate count of the trees to be planted along the corridor.

Ms. Saunders noted that for the stations and the corridor landscapes the expectation is that in the first year after planting the conifer and deciduous tree heights will average between five and fifteen feet, though there will be some variance. Within five years, streetscape trees should be relatively established and should have grown by two to five feet in height. After 20 years streetscape trees are expected to be between 70 percent and 80 percent of maturity. At the mitigation site, the plant material will vary but will be approximately one to three feet in height at the time of planting, though for the 25 percent of plantings that will be larger at the time of planting the heights will be greater. A high survival rate over time is one of the performance standards for the mitigation sites.

Co-Chair Mathews reminded the Committee that outside the corridor there will be mature trees that will not be removed to accommodate the project. With regard to the types of trees, he asked why firs are not included. Ms. Saunders said the pallet graphic was not intended to portray the only types of trees that will be included. Both the corridor and mitigation landscapes will include large numbers of native plants. Mr. Logan pointed out that Douglas Fir will be one of the most common plants used in the mitigation areas.

Mr. Glass pointed out that on Vicinity Map 3 it appears that there are some trees marked for removal that lie on the rear line of the properties to the south of Surrey Downs Park. He asked if the properties are going to be taken as part of the project. Mr. Lacson said it was his understanding that the properties in question will be acquired by Sound Transit. Mr. Logan added that a new facility to cross over the tracks will be constructed there and that is why the trees are being removed. Ms. Saunders said some trees will be removed to accommodate the new entrance to the park.

Answering a question asked by Ms. Derrington, Mr. Logan said the Sweyolocken mitigation site is mostly wet, though there is a small upland component. Along the corridor there are mitigation sites associated with wetland buffers, and they are upland.

## 4. SOUTH BELLEVUE STATION UPDATED RENDERINGS

John Walser, senior architect with Sound Transit, shared with the Committee the alignment features of the South Bellevue area superimposed over an aerial map. He identified the construction disturbance zone around the perimeter and clarified which of the existing trees will be disturbed by construction activities and which will not. The completed guideway will preclude the opportunity for trees. He said it should be kept in mind because that the travel lanes of Bellevue Way will not be used for construction access, some existing trees on the site not in the way of the guideway will be in the way of construction activities.

The Committee was shown photos taken from various locations in and around the South Bellevue station site. Mr. Walser pointed out the existing trees and indicated that while some will be removed others will be retained. Some of the photos had the guideway and parking garage superimposed on them to give a better idea of how much will be seen and what will not be seen based on the existing trees.

Mr. Walser reminded the Committee that the landscape architect team has drawn inspiration from the boardwalks in the Slough. Based on that, the site paving within the station will include a boardwalk-type pattern, not stamped but tooled to replicate 12-inch wide by eight-foot long planks. Outside the boardwalk pattern will be a more typical three-by-three checkerboard grid. Additionally, consideration will be given to integral coloring of the boardwalk concrete that would be darker and warmer than the standard gray concrete.

Having identified the disturbance zone on the map, Mr. Walser explained that conifers will be located around the perimeter and the detention pond. Coniferous trees will be planted along the 15-foot buffer zone between Bellevue Way and the station site per city standards, and those trees will be limbed up to seven feet to make sure they do not form a visual barrier for security purposes. A mixture of deciduous tree types and shrubs will go into that zone.

Within the large air wells that bring natural ventilation to the lower floors of the garage some Mountain Hemlocks will be planted along with vine maples, azaleas and other shrubs. Trees will flank the sidewalks coming down into the site to give both pedestrians and drivers a sense of entry when coming into the site. Around the perimeter there will be a mixture of Shore Pines, Western Hemlocks, Western Red Cedar, and Mountain Hemlocks. Along the street there will be a mixture of Pyramidal European Hornbeam, vine maple and ginkgo. The landscape architects were also able to identify some areas in front of the guideway in the plaza areas where a smaller tree can be used, and Crape Myrtle will be planted there as well as in the kiss and ride area and in the paratransit drop-off zone.

Mr. Walser said there are two sets of criteria for the tree clear zone for the guideways. Where a tree will grow taller than the guideway, the tree must be located 34 feet or more from the centerline to avoid having branches within four feet of the face of the guideway.

If the guideway is high enough and the species of tree is short enough, it is possible for the trees to be planted closer to the guideway. Crape Myrtle was selected for the location in front of the station in front of the guideway because it fits into the latter category. There also is a fairly standard set of shrubs common to the area that are used, including Mugo Pine, salal, cranberry bush and azalea. The landscape architect in acknowledging the Slough and the blueberry farm has indicated a desire to incorporate some blueberry shrubs in the mix. Sedges will be included in the bio-retention areas where rainwater will be taken from the canopy roofs and used to create planter areas that normally would be high and dry underneath the guideway and the station.

The Committee was reminded that the site elevation drops continuously from Bellevue Way. Some fill will be used to keep the grade no more than roughly two feet lower near the garage entry. The garage has five levels, two of which are below grade, and what will be seen from the station is only three levels.

Mr. Walser shared with the Committee updated renderings of the station and views of it from various locations, including from residences up on the hill. He said the architects heard the comments of the Committee and the public about the station looking gray and industrial, and they have proposed the use of autumn colors that are found in the Slough for the metal ceiling panels on the underside of the guideway. They have proposed using two shades of yellow alternating in the panels, some of which will be perforated and therefore look darker than others. The same approach would be used on the ceiling panels of the lobbies in the parking garage near the elevators and stairs.

Mr. Walser said there also was a sense of place lacking from the north and south entries, so the architects were directed to address that issue. They came up with the concept of taking the ceiling plane and dropping it vertically with metal banners, some perforated and some solid, hanging at different heights, to add color and a sense of place. At the north entrance the yellow ceiling turns down on the underside of the stairs and escalators, and the architects are dropping the ceiling down just a little bit in the entry areas to add emphasis.

Mr. Walser said artist Katy Stone has zeroed in on her inspiration on cattails for her work along the top of the garage. She is still working on the colors and other details. For the perforated screens on the garage she will be taking cues from willow trees, which will translate to patterning on the concrete walls at the south and north ends of the parking garage where there are sheer walls. The architects are working to meld Ms. Stone's willow concepts into an abstract tree patterning for the concrete wall.

With regard to the work of artist Vicki Scuri in addressing the acoustic panels and the guideway columns, Mr. Walser said discussions are continuing as to whether or not the frit should be expanded to the acoustic panel patterning up above. He explained that frit is a dot pattern embedded in glass that can be used to create patterns. Drawings depicting Ms. Scuri's patterning for the acoustic panels and the columns were shown.

Ms. Derrington asked how Sound Transit guards against graffiti. Mr. Walser said Sound

Transit has a graffiti contractor on call. In many cases a wax coating is applied over the surfaces so that graffiti can be removed by removing and replacing the wax coating. He said Sound Transit's experience relative to the downtown transit tunnel in Seattle has been that where there is artwork and extra attention paid to detail and materials, there has been far less tagging.

Mr. Miles commented that the colors shown go well with the landscaping. Mr. Walser said he has been pleased with the progress made in working with the architects to move away from the aluminum, steel and concrete aesthetic.

Co-Chair Van Houten said the new renderings represent a great improvement. She said it was exciting to see the preliminary artwork shown as well.

Mr. Glass agreed that improvements have been made but said he continued to have mixed feelings as to whether or not all of the Committee's concerns have been addressed. He suggested it would be helpful to conduct a review of the earlier comments. Mr. Walser allowed that not all of the comments have been addressed but said the hope is that the product will in totality be pleasing to the Committee. Things are still at the big picture stage for the most part but at some point it will be a good idea to review the comments checklist.

Mr. Glass said the experience of the users will be greatly enhanced by all of the improvements. For those living across Bellevue Way, however, the artwork may not be as evident and may appear to be only part of the structure, and one comment made by the Committee was in regard to camouflaging the structure to the degree possible.

Co-Chair Mathews said he was counting on those attending the upcoming open house to provide input along those lines after seeing the new renderings.

Co-Chair Van Houten suggested it would be helpful to have some photographs taken from the houses on the adjacent hills looking toward the site. Mr. Walser said he would look into that.

Ms. Jones said she also felt much better about the project after seeing the new renderings. She agreed, however, that a review of the comments made to date should be made to make sure everything has been satisfactorily addressed. She also commented that Ms. Scuri talked about addressing 600 feet or more of the sound wall, which would be a lot of color, and asked if it would be possible to represent the seasons by coloring four portions differently. Mr. Walser said the suggestion may have some merit. He noted that the renderings actually toned down the brightness of the colors used by Ms. Scuri in her drawings. He stressed that the art work and color combinations are continuing conversations.

Mr. Walser said conversations are yet to be had relative to what should be done with the guideway to the south and north of the station. The Committee previously expressed a desire to see the guideway painted. Hopefully with treatment of the columns and using

some locations around the columns for treatment on the panels will make it unnecessary to paint the guideway itself.

With regard to the Committee's meeting scheduled for November 5, the day before the open house, Mr. Jackson pointed out that many of the items set for discussion had already been discussed, and that some other items would not be ready for discussion by that date. He put to the Committee the question of whether or not the meeting should be canceled.

Answering a question asked by Mr. Glass, Mr. Jackson said copies of the noise study will be supplied to the members along with copies of the consultant's report, the city's response to the consultant's report, and Sound Transit's response to the city's response. The Committee will then discuss the details and make recommendations as to what is needed in order to comply with city code. Mr. Glass said it would be good to receive input as early in the process as possible. Mr. Jackson said the Committee will be afforded the opportunity to comment before any final decision is made by the design team.

There was consensus to cancel the November 5 meeting.

5. PUBLIC COMMENT

Ms. Betsy Blackstock, a Surrey Downs resident, said she was impressed with the comments, questions and observations of the Committee members. She said it is clear the Committee has found a footing and a voice. The best practices report talks excessively about the use of saplings in plantings. She said by definition a sapling is four inches in diameter. Sound Transit staff, however, has made reference to tree caliper and gallon size. She suggested common references should be used. It has been said smaller trees have better survival rates and grow faster, and the Committee and the public should be provided with links to that data. With regard to the trees in the northern part of Surrey Downs, she said the homeowners who live above the condominiums where the East Mains station will be received letters indicating their properties will be needed for the light rail project. At the subsequent Sound Transit board meeting, however, it was clarified that what was needed was a five-foot permanent easement and a ten-foot temporary easement. A Surrey Downs resident has on his property six 60-foot trees that will be taken down in order to build the sound wall. The irony is that the trees themselves serve as an incredible sound wall. It was disturbing that neither the mayor nor deputy mayor knew anything about the Sound Transit letter that went out in May. The Committee is doing a great job, but it is troubling to hear Sound Transit staff say money is the limiting factor. The Sound Transit staff serves as conduits only; they are not the decision makers. The Committee is charged with making the recommendations.

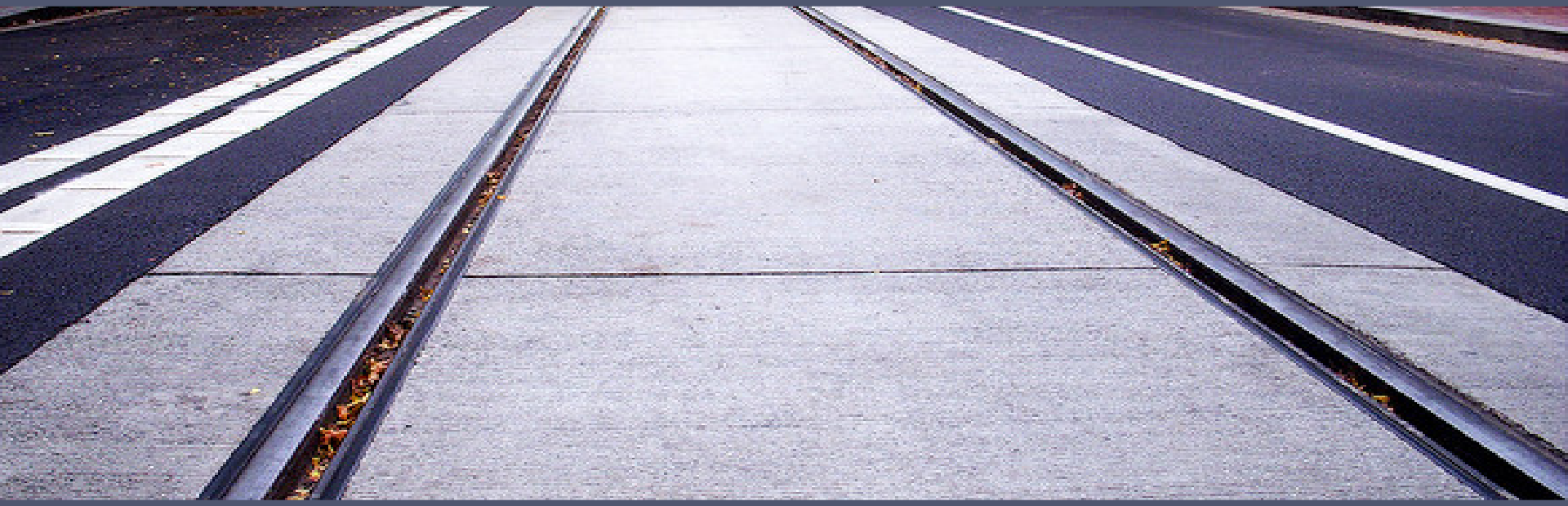
Ms. Pam Unger, also a Surrey Downs resident, thanked the Committee members for the work they are doing. She voiced support for the colors the Committee asked Sound Transit to add to the station design; consideration should be given to adding more. She said the trees lining 112th Avenue SE are beautiful the way they change with the seasons and it is really sad that so many will be removed. If there is a way to save them, they

should be saved. The replacement trees should include those that change color by season.

6. ADJOURN

Co-Chair Van Houten adjourned the meeting at 5:08 p.m.

# LIGHT RAIL PERMITTING ADVISORY COMMITTEE



## COMMITTEE MEETING

October 29, 2014|3:00PM -5:00PM | ROOM 1E-113

# Agenda

- **3:00**
  - Call to Order, Approval of Agenda, Approval of October 15th Meeting Minutes – Co-Chairs Van Houten and Mathews
  - Public Comment
- **3:20**
  - Tree Preservation and Context Sensitive Design - Sound Transit and Matthews Jackson
- **4:00**
  - South Bellevue Station Updated Renderings – Sound Transit
- **4:50**
  - Public Comment
- **5:00**
  - Adjourn

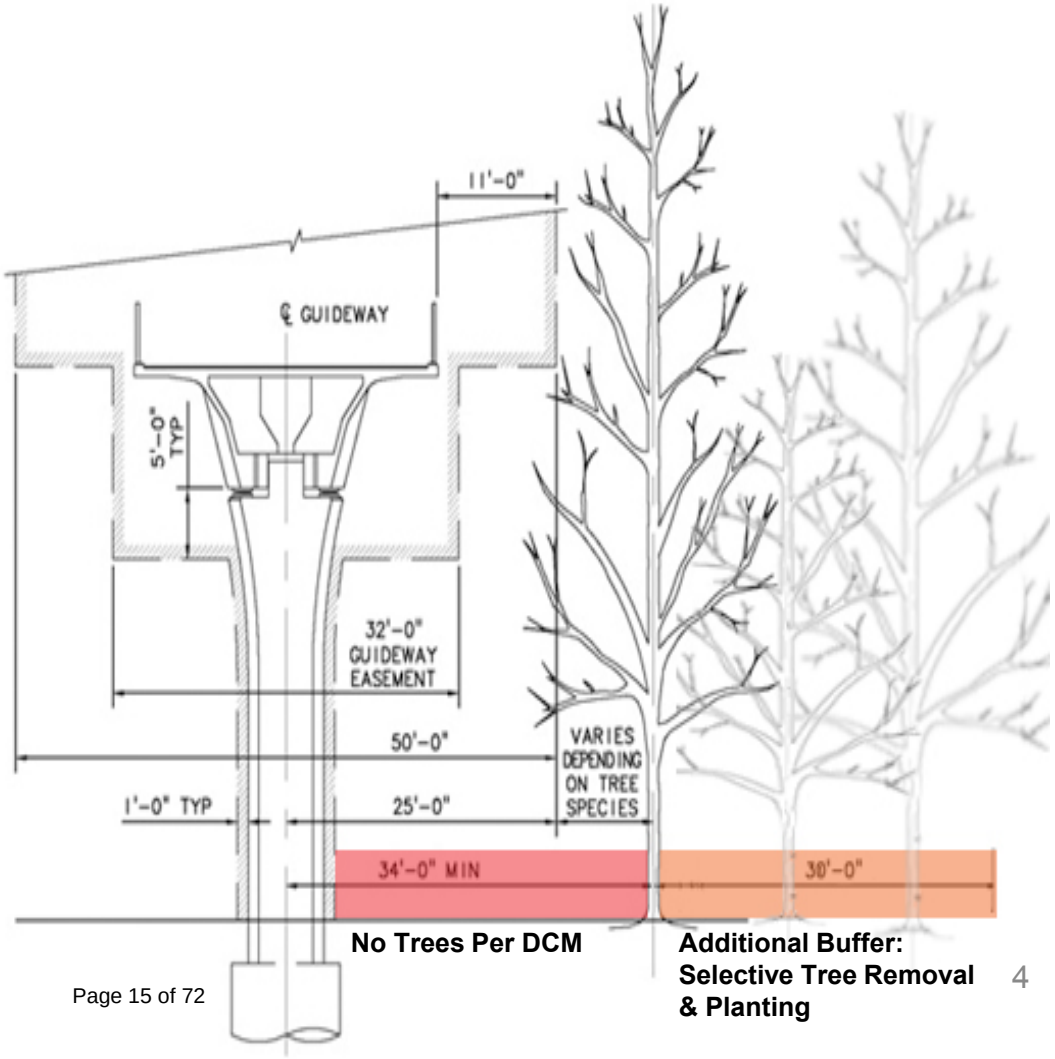
# Methodology & Removal Overview

- Tree Assessment
  - Tree location survey – all trees 4 in diameter breast height (dbh) and larger
  - Tree identification classification
    - Species
    - Category
    - Significant
    - Health

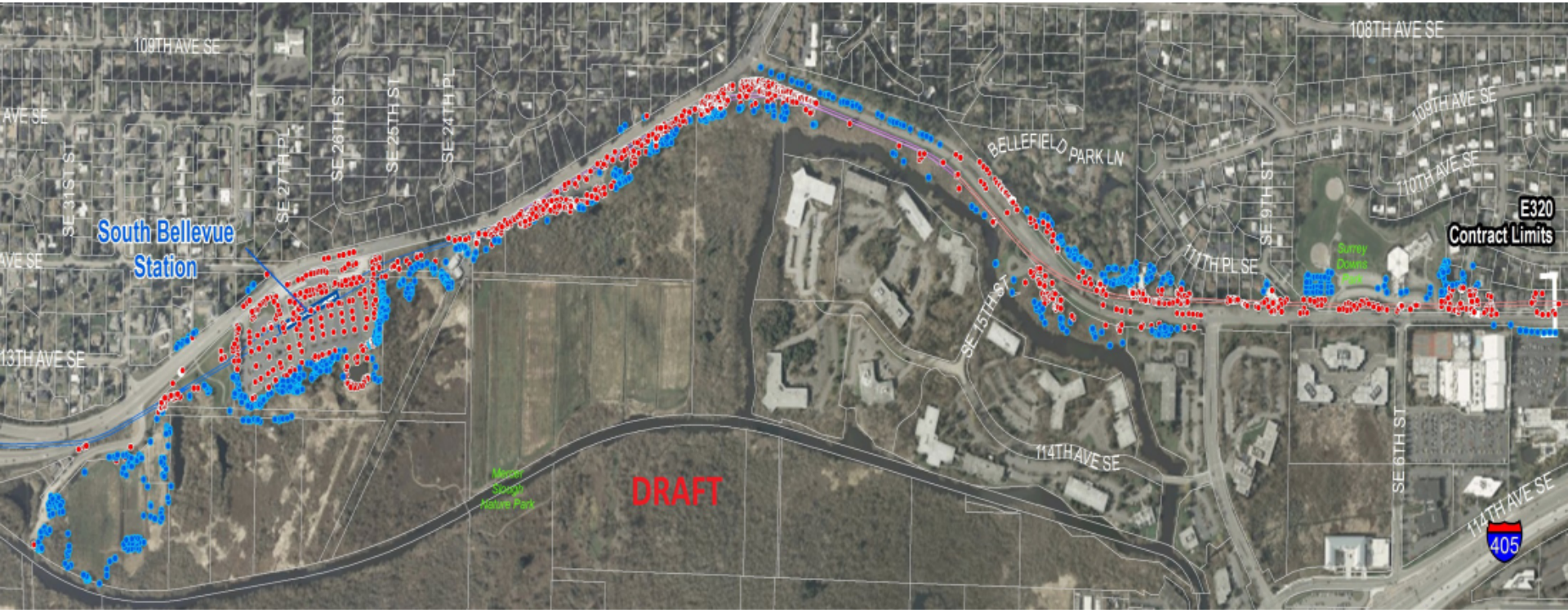
- Tree Removal Overview
  - Trees within the Project foot print
  - Safe Operations & Maintenance Area
    - 34’ from centerline of guideway, per ST’s Design Criteria Manual
    - Additional 30’ buffer zone

# Safe Operations and Maintenance Area

- No trees/stumps within 34 ft of the guideway centerline
- Scrub-shrub & groundcover planting allowed
- Additional Buffer: 30ft for selective planting and removal
- Prevent mature tree canopy from blowing onto the guideway



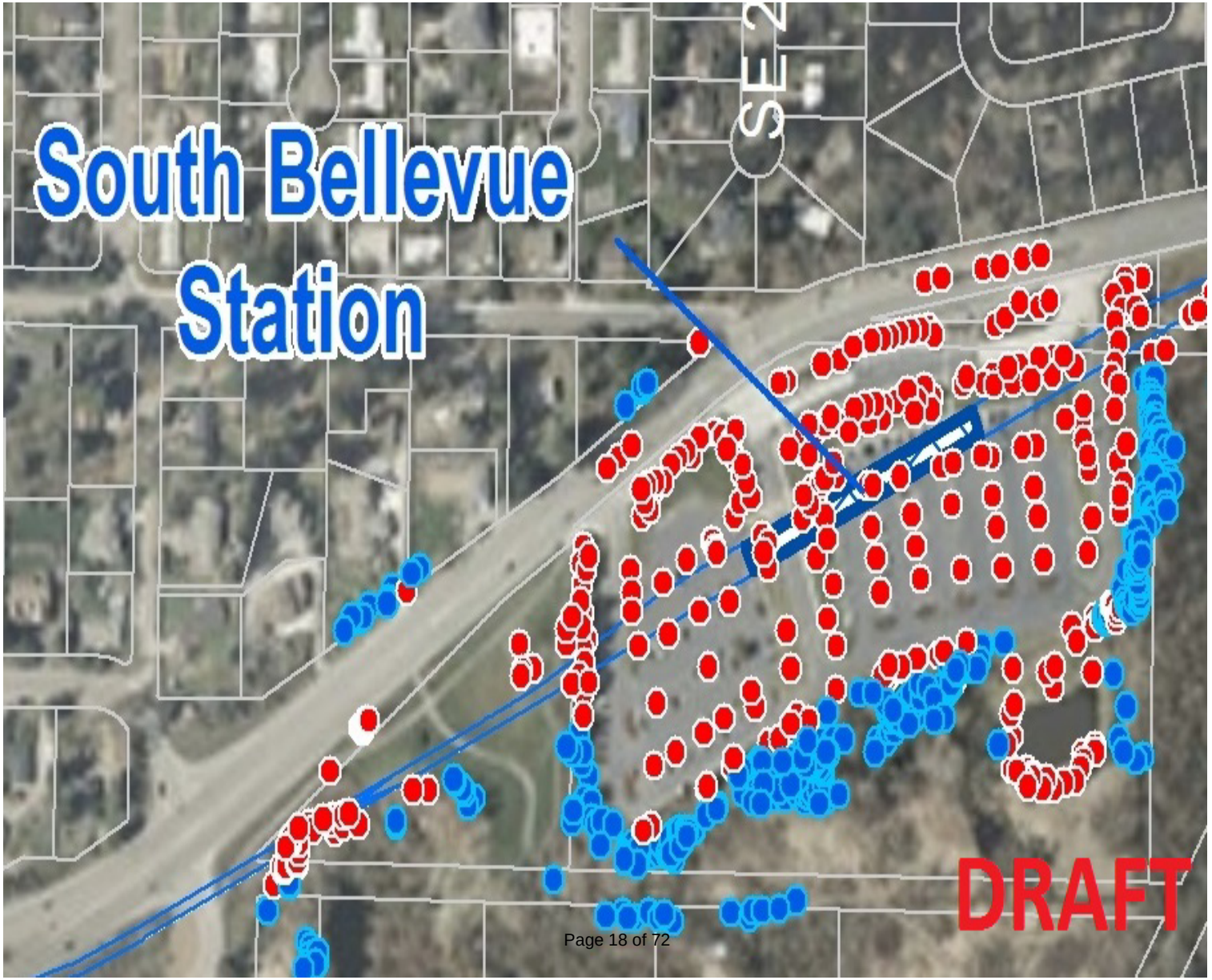
# Tree Preservation & Removal Overview



# Tree Survey, Removal & Replanting- Summary

| E320 Design Package Tree Removal | |
|---|---|
| Total Trees Inventoried (≥4”DBH) | **2,196** |
| Total Trees Removed | **1,279** |

| E320 Design Package Tree Replacement | Corridor and Station Plantings | Mitigation/Restoration Area Plantings | |
|---|---|---|---|
| | | Coniferous | Deciduous |
| Proposed Trees to be Planted | 595 | 722 | 8,262 |
| Total Trees to be Planted | **9,579** | | |


South Bellevue
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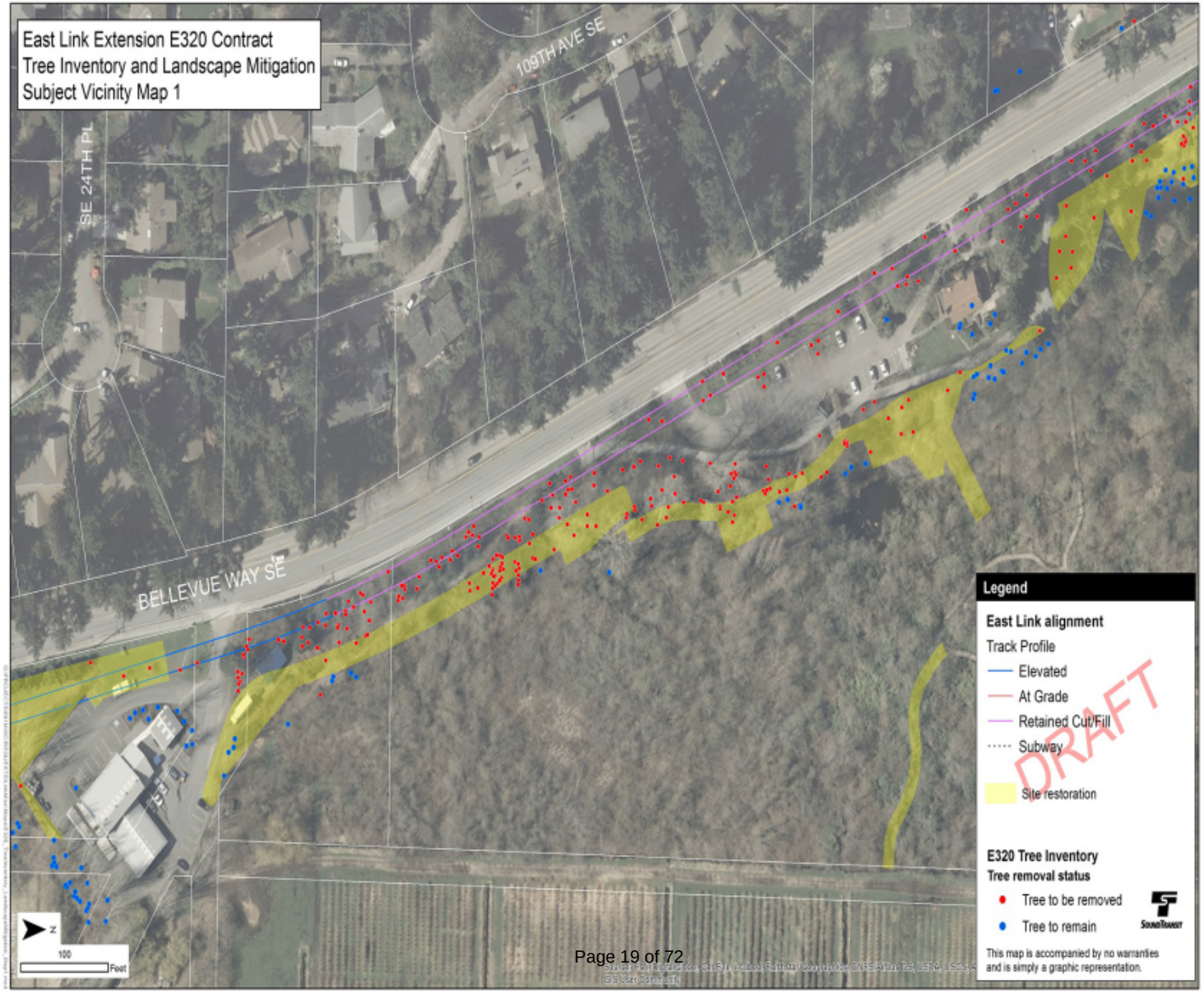
East Link Extension E320 Contract
Tree Inventory and Landscape Mitigation
Subject Vicinity Map 1
109TH AVE SE
SE 24TH PL
BELLEVUE WAY SE
Legend
East Link alignment
Track Profile
Elevated
At Grade
Retained Cut/Fill
Subway
Site restoration
DRAFT
E320 Tree Inventory
Tree removal status
Tree to be removed
Tree to remain
This map is accompanied by no warranties and is simply a graphic representation.
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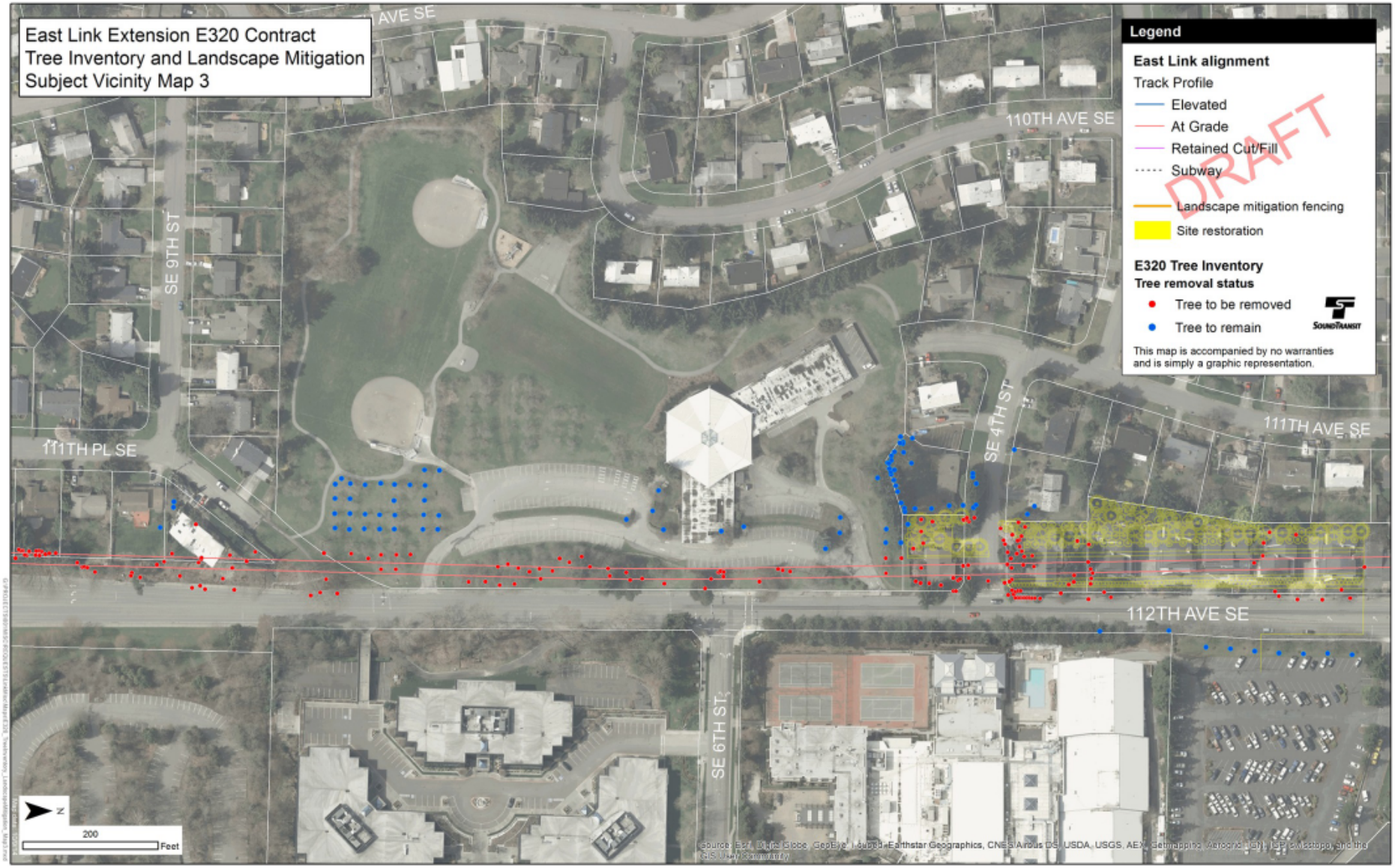
East Link Extension E320 Contract
Tree Inventory and Landscape Mitigation
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Legend
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Landscape mitigation fencing
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E320 Tree Inventory
Tree removal status
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110TH AVE SE
111TH AVE SE
112TH AVE SE
111TH PL SE
SE 9TH ST
SE 4TH ST
SE 6TH ST
N
200
Feet

# Tree Specifications

- Trees within Station / Corridor Landscapes
  - Size Range: 1½” – 3” caliper / 7’-12’ tall (Proposed)
  - Incorporates additional native species when close to Mercer Slough

- Trees within Environmental Mitigation Landscapes
  - Size Range: 2-gal. / ~1.5’-3’ tall (Proposed)
  - Northwest native plants

# Station Planting Areas – South Bellevue Trees

## TREES - EVERGREEN


**Shore Pine**
*Pinus contorta var. contorta*

Screening evergreen tree proposed for around the station perimeter.


**Western Hemlock**
*Tsuga hereophylla*

Screening evergreen tree proposed for the station perimeter.


**Western Red Cedar**
*Thuja plicata*

Screening evergreen tree proposed for around the station perimeter.


**Mountain Hemlock**
*Tsuga mertensiana*

Evergreen tree proposed for screening the station perimeter and the west side of the parking garage.

## TREES - DECIDUOUS


**Pyramidal European Hornbeam**
*Carpinus betulus 'Fastigiata'*

Proposed street tree for along Bellevue Way SE in front of the station.


**Vine Maple**
*Acer circinatum*

Small, native, understory tree proposed for around the parking garage.


**Maidenhair Tree**
*Ginkgo biloba 'fastigiata'*

Deciduous tree proposed for along entryways to the station.


**Jade Butterfly Ginkgo**
*Ginkgo biloba 'Jade Butterfly'*

Small, multi-stem, deciduous tree proposed for under the guideway and around the station plazas.

# Tree Retention

**City Initial Comments**

- Profile #1: Existing Condition – what is looks like today
- Profile #2: Cleared Condition – what it looks like after clearing
- Profile #3: Planted Condition – what it looks like after planting has occurred
- Profile #4: Planted Condition at year 5 – what is looks like at five years
- Profile #5: Planted Condition at year 10 – what is looks like at 10 years
- Profile #6: Planted Condition at year 20 – the target condition.

Different profile sections will allow us to see how the trees/vegetation will be in 20 years time. This will allow us to address the interim condition and identify what/how we can make some targeted adjustments to add some taller trees or faster growing trees that we can phase out over time as we approach the target condition.

# South Bellevue Station Updated Renderings

## Sound Transit Presentation

# Next Meeting

**November 5th**

- **Continued discussion of tree preservation, art, and revised renderings as needed/requested by CAC**

**November 6th**

- **Sound Transit Open House at Enatai Elementary School**

# WELCOME TO SOUTH BELLEVUE FINAL DESIGN

## EAST LINK EXTENSION

## The purpose of tonight's meeting is to:

- Present the final South Bellevue station, parking garage and corridor design plans
- Introduce the community to the artists selected for the South Bellevue station
- Provide an overview of traffic impact plans, share planning details, and review typical construction sequencing

## Agenda

### 5-7 p.m. Open house

- Meet with project staff and view display boards and graphics featuring information about the final design plans for the South Bellevue segment of East Link

**5:30 p.m. Overview presentation**

**7 p.m. Meeting adjourns**

Nov 2014

SOUNDTRANSIT
RIDE THE WAVE

# LIGHT RAIL ALIGNMENT

## EAST LINK EXTENSION


Length: 14 miles

Ride times:

- Mercer Island to University of Washington: 20 minutes
- South Bellevue to Sea-Tac Airport: 50 minutes
- Overlake Transit Center to Bellevue Transit Center: 10 minutes

Rider projection: About 50,000 riders will use East Link every day by 2030

Budget: $2.8 billion (2010 $)

Start of service: Targeted 2023

| 2006-2011 | 2011-2015 | 2015-2022 | Targeted 2022 | Targeted 2023 |
|---|---|---|---|---|
| Planning and environmental review | Final design (we are here) | Construction | Testing & pre-operations | East Link in service |

Nov 2014

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RIDE THE WAVE

# THE COLLABORATIVE FINAL DESIGN PROCESS

## EAST LINK EXTENSION

### Final design has been a collaborative effort between Sound Transit and project stakeholders including:

- Community members and neighborhood groups
- City of Bellevue
- City of Bellevue Light Rail Permitting Citizens Advisory Committee
- Other jurisdictional authorities, such as, Washington State Department of Transportation, emergency service providers, King County, and transit providers


### Your input helped influence the station design elements, including:

- Station art reflective of the Mercer Slough natural environment
- Locating the northbound bus stop on Bellevue Way SE
- Preserving existing Cottonwood trees surrounding the park & ride
- Additional trees planted west of the station for screening
- Platform windscreens oriented to protect waiting passengers

Nov 2014

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# SOUTH BELLEVUE SEGMENT OVERVIEW

## EAST LINK EXTENSION


## Benefits:

- Provides access to high quality, frequent transit service that operates 20 hours per day
- Approximately 4,500 daily boardings (2030)
- Increases travel options for South Bellevue residents and employees, consistent with City of Bellevue transportation goals
- Expands the South Bellevue Park-and-Ride to approximately 1,500 stalls
- Bus transfer and layover areas

### Travel times (from South Bellevue Station)

- International District/Chinatown = 14 minutes
- University of Washington = 24 minutes
- Sea-Tac Airport = 50 minutes (with transfer at International District Station)
- Overlake Transit Center = 16 minutes

Nov 2014

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RIDE THE WAVE

# SUSTAINABILITY

## EAST LINK EXTENSION

**Sound Transit's regional public transit system creates easy connections to more places for more people. We are committed to leaving the planet a better place.**

### Our framework for sustainability:

- People — Help people move freely by increasing the availability and use of regional transit
- Planet — Promote environmental stewardship and conserve natural resources
- Prosperity — Maximize agency efficiency and enable people and businesses to save time and money

**Sound Transit is always looking for ways to apply sustainable principles to our projects, including using renewable construction materials, natural drainage solutions and maximizing natural light at stations.**

### Sustainability measures in South Bellevue:

Stream enhancements near Coal Creek.

Reuse, salvage and recycle construction materials and debris.

Keep water clean by using bio-retention and infiltration drainage solutions.

Inventory migratory bird nests to minimize disruption during construction.

Nov 2014

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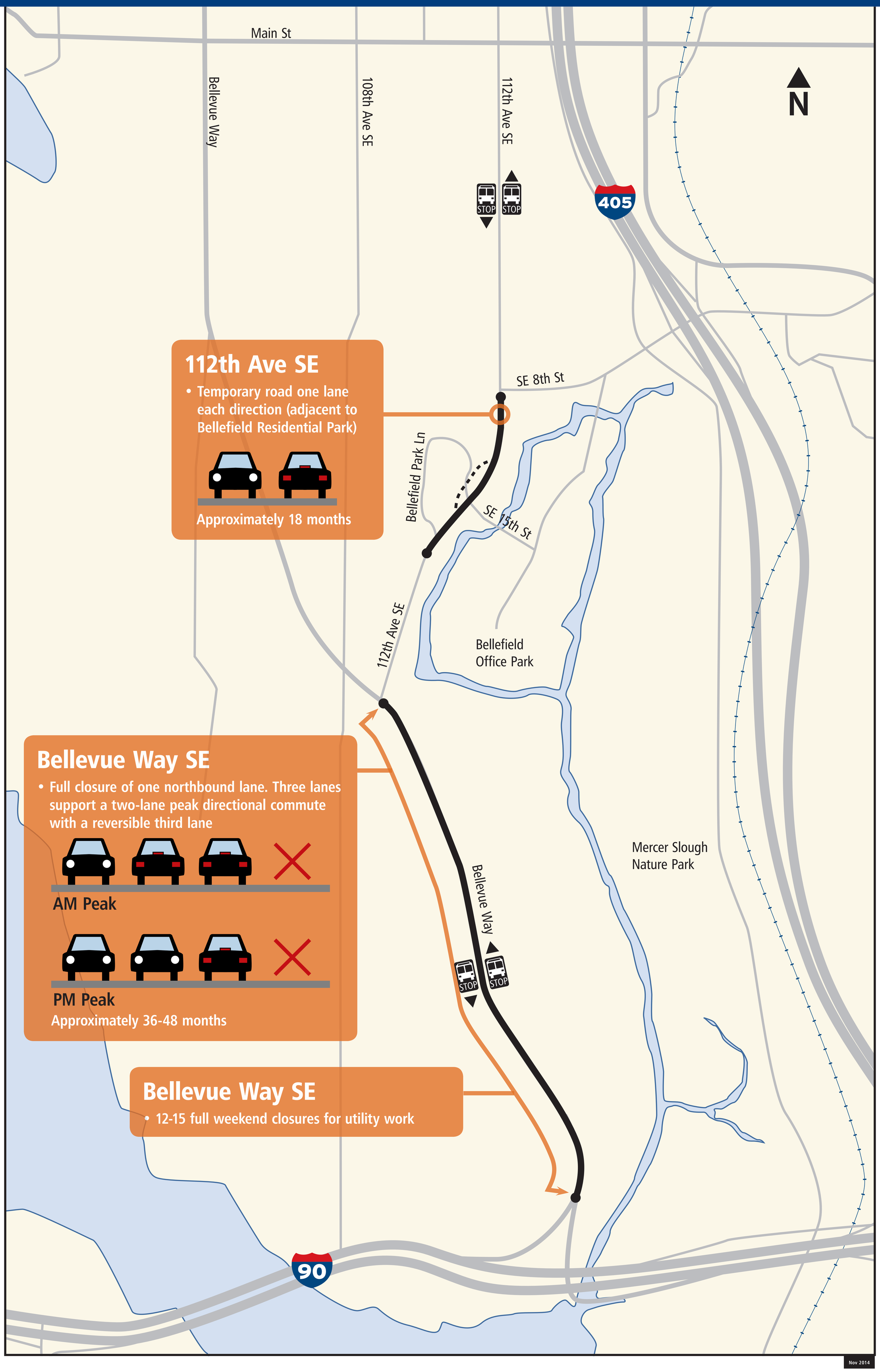
RIDE THE WAVE

# KEEPING YOU MOVING

## EAST LINK EXTENSION

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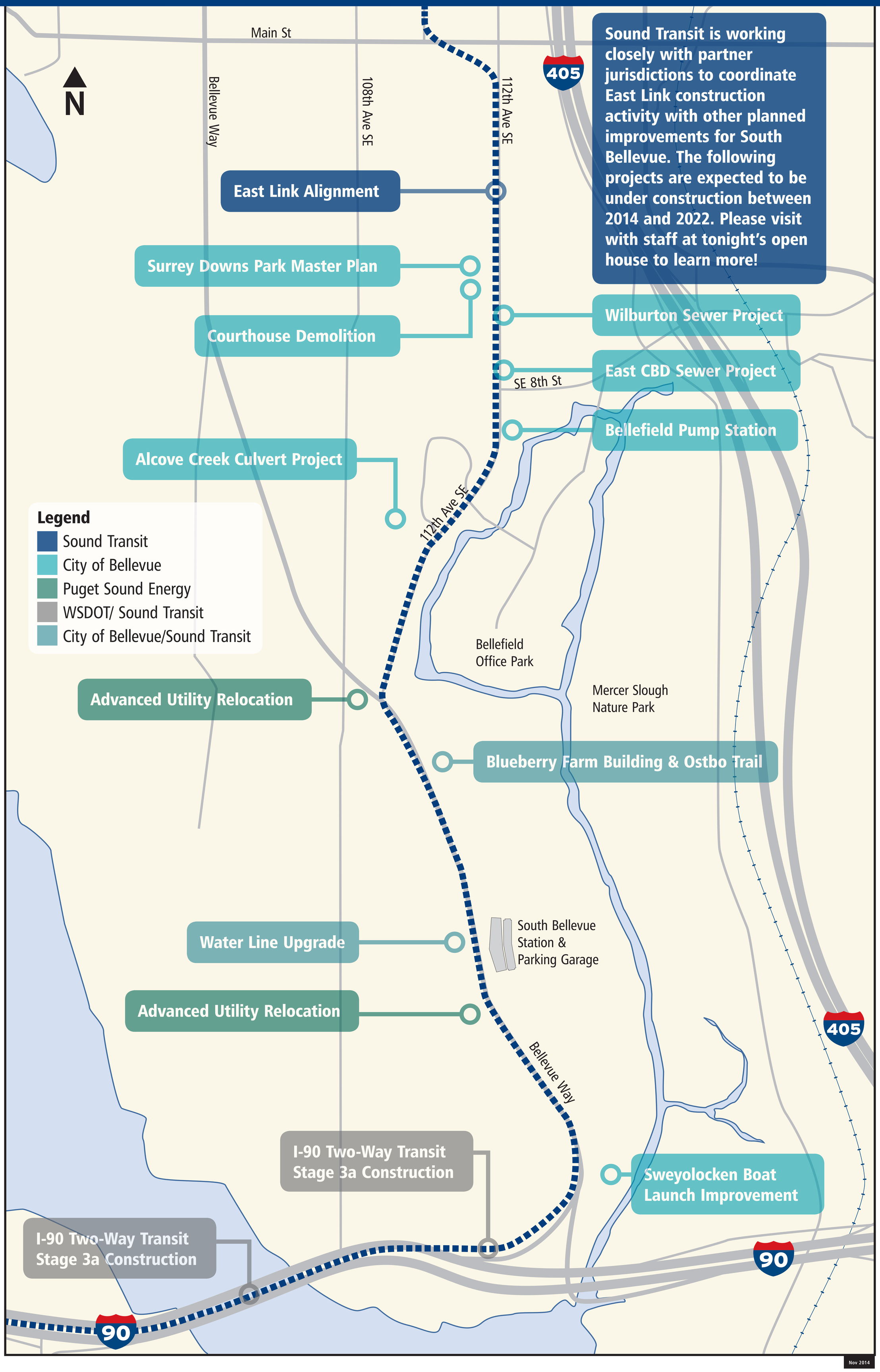
# CONCURRENT PROJECTS 2014-2022

## EAST LINK EXTENSION




Nov 2014

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# CONSTRUCTING THE SOUTH BELLEVUE STATION

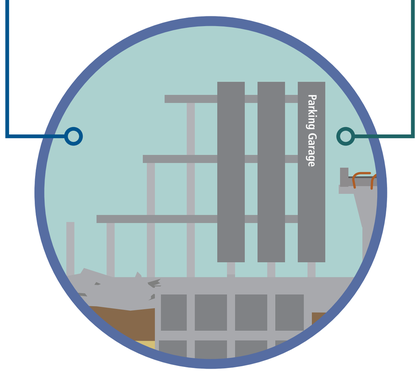
## EAST LINK EXTENSION

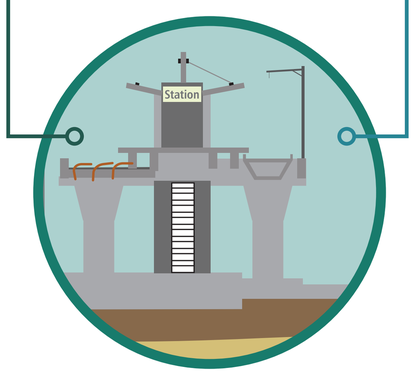
**Starting in 2016, the South Bellevue park-and-ride will become an active construction zone and no longer accessible to the public. The new 1,500 stall South Bellevue park-and-ride garage will open after approximately 5 years of construction.**

- The South Bellevue park-and-ride will serve as the construction hub for building the light rail station, track, and 1,500-stall parking garage and staging equipment.
- Sound Transit is working to identify alternate options for park-and-ride users, including directing riders to underused park-and-rides, leasing parking space from community churches, and potentially constructing a new off-site parking facility.

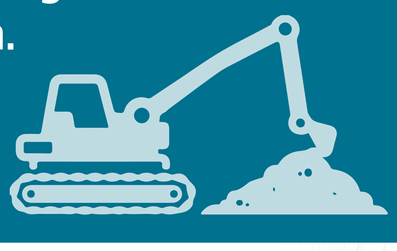
2016 — Approximately 5 years of construction — 2023

| Site Preparation | Garage Construction | Garage Finishes | Station Construction | Station Finishes | Site Finishes | Systems Testing | Station Opens |
|---|---|---|---|---|---|---|---|
| | | | | | | | Garage & Bus platform open to public |




**Crews will only access the site from the west to avoid impacting the Mercer Slough.**



**22,000 cubic yards of concrete poured to build the garage and station – enough to fill seven Olympic size swimming pools.**


**The park-and-ride will be closed for 5 years, reduced from the original estimate of 7 years.**

| Excavate | Fill |
|---|---|
| 100,000 cubic yards | 110,000 cubic yards |

**The unique soil conditions of the Mercer Slough require excavating 100,000 cubic yards of earth from the site and hauling in 110,00 cubic yards of new fill dirt.**

**210 drilled shafts that average 50-90’ deep or approximately 3 miles in total combined length.**

Nov 2014

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RIDE THE WAVE

East Link | South Bellevue to Overlake Transit Center
Contract No. RTA/AE 0143-11

# Contract E320
# Noise Impact Assessment Using Bellevue City Code-Operations

June 17, 2014

Prepared for:

SOUNDTRANSIT

Prepared by:

H J H

FINAL DESIGN PARTNERS.

# Contract E320
# Noise Impact Assessment Using Bellevue City Code - Operations

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# Table of Contents

1.0 Introduction ..... 1
2.0 Bellevue City Code Noise Limits ..... 2
2.1 Exemptions Applicable to Train Noise ..... 2
2.2 Maximum Permissible Noise Levels ..... 3
2.3 Duration of Train Event ..... 4
2.4 Prediction Location ..... 5
3.0 Noise Impact Assessment Methodology ..... 6
4.0 Noise Impact Assessment ..... 10
4.1 Predicted Nighttime Noise from LRVs ..... 10
4.2 Summary of Predicted Impacts and Mitigation Measures ..... 17
5.0 Appendix A: Background on Noise ..... 18
6.0 Appendix B: Parcel Table and Parcel Figures ..... 20

# Tables

Table 2-1: Maximum Permissible Sound Levels for Light Rail Vehicles ..... 3
Table 2-2: Duration of Train Events for Different Train Speeds ..... 5
Table 2-3: Effect of Sound Barrier Location on Noise Reduction ..... 6
Table 3-1: Measured SEL Reference Levels ..... 7
Table 3-2: East Link Operating Plan ..... 8
Table 3-3: Recommended Sound Wall Lengths and Heights from FTA Noise Impact Analysis ..... 9
Table 4-1: Predicted Nighttime Noise Levels ..... 11
Table 4-2: Summary of Predicted Impacts and Mitigation Measures ..... 17
Table 6-1: List of Parcel Numbers and Corresponding Addresses ..... 20

# Figures

Figure 1-1: Site Map Showing Report Limits ..... 2
Figure 2-1: Noise Event Illustrating 10 dB Down Points ..... 4
Figure 5-1: Typical Noise Levels ..... 18
Figure 6-1: Recommended Sound Walls for Parcels EL100a-EL100i and EL101a-EL101h ..... 23
Figure 6-2: Recommended Sound Walls for Parcels EL100h-EL100p, EL101g-EL101o ..... 24
Figure 6-3: Recommended Sound Walls for Parcels EL101p-EL101s ..... 25
Figure 6-4: Recommended Sound Walls for Parcels EL101t-EL103 ..... 26
Figure 6-5: Recommended Sound Walls for EL104-EL114 ..... 27
Figure 6-6: Recommended Sound Walls for Parcels EL115-EL132 ..... 28

Figure 6-7: Recommended Sound Walls for Parcels EL132-EL144 ..... 29
Figure 6-8: Recommended Sound Walls for Parcels EL144-EL149e ..... 30
Figure 6-9: Recommended Sound Walls for Parcels EL149f-EL151d ..... 31
Figure 6-10: Recommended Sound Walls for Parcels EL151e-EL163 ..... 32
Figure 6-11: Recommended Sound Walls for Parcels EL164-EL169 ..... 33
Figure 6-12: Recommended Sound Walls for Parcels EL174-EL189 ..... 34

## Acronyms and Abbreviations

| | |
|---|---|
| BCC | Bellevue City Code |
| dBA | A-weighted decibel |
| DCM | Design Criteria Manual |
| DF | Direct Fixation |
| EDNA | Environmental designation for noise abatement |
| EIS | Environmental Impact Statement |
| FHWA | Federal Highway Administration |
| FTA | Federal Transit Administration |
| Ldn | 24-hr day-night sound level |
| Leq | Equivalent sound level |
| LRT | Light Rail Transit |
| LRV | Light Rail Vehicle |
| ROD | Record of Decision |
| SEL | Sound Exposure Level |
| ST | Sound Transit |
| TNM | Traffic Noise Model |

# 1.0 Introduction

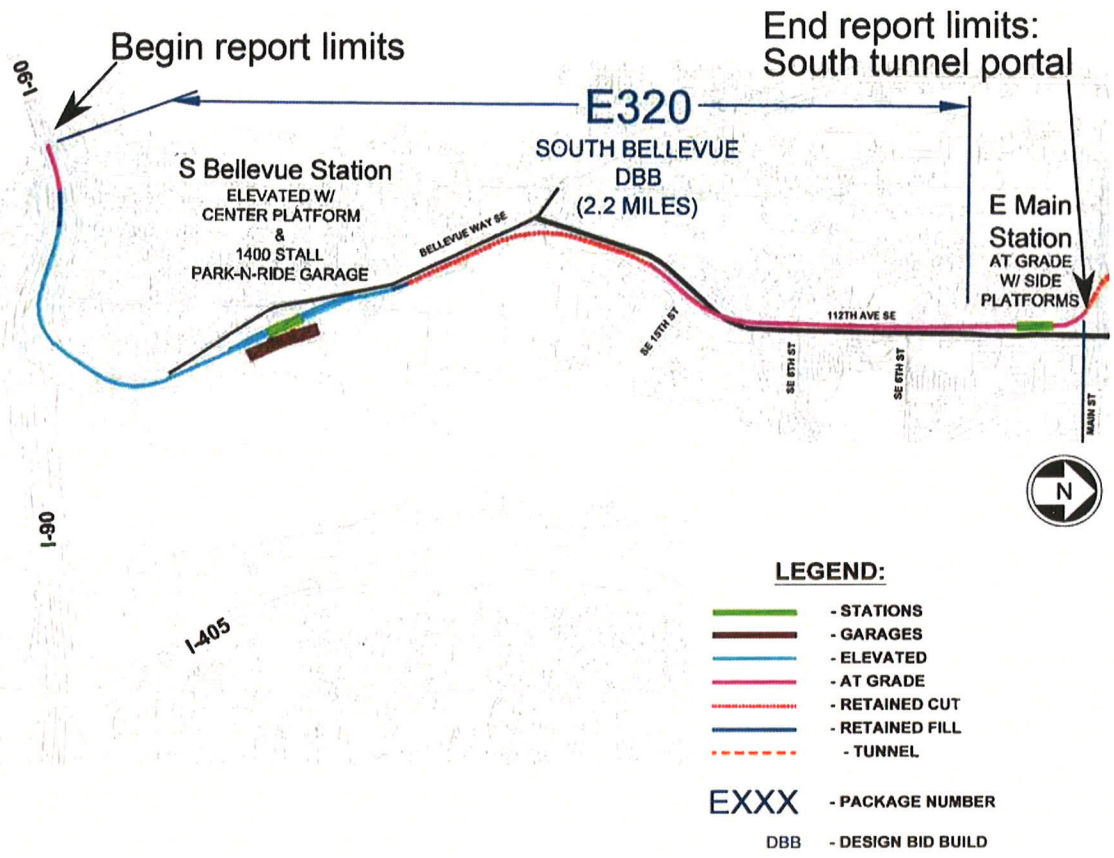
This report presents the results of the noise impact assessment of light-rail operations using the Bellevue City Code (BCC) noise limits. Included in the analysis are parcels from the beginning of the E320 Contract to the Downtown Bellevue Tunnel south portal. Figure 1-1 shows a site map illustrating the limits of the analysis presented in this report.

The noise predictions and impact assessment presented in this report are consistent with the guidelines and methodology presented in the following documents:

- Federal Transit Administration's (FTA) Transit Noise and Vibration Impact Assessment guidance manual (referred to in this report as the FTA guidance manual);
- Sound Transit's Link Noise Mitigation Policy, February 2004; and
- The East Link Final Environmental Impact Statement, July 2011.

The noise impact thresholds used in this report are the maximum permissible sound levels set by BCC 9.18.030. The predicted light-rail operations noise levels are compared to those thresholds. The modeling for this report initially predicted that, after installation of the mitigation required by the FTA Record of Decision, noise from train operations would comply with Chapter 9.18 of the BCC at all properties except two: El 133 and EL148, as stated in Table 4-1. In response, Sound Transit proposes to extend the noise wall to the west near parcel EL 148, as depicted on Figure 6-8, and add sound absorptive treatment to the trench walls near parcel EL 133, as depicted on Figure 6-7. With this additional mitigation, which is explained in section 4.2, this report predicts compliance with Chapter 9.18 BCC at all properties within the E320 study area.

**Figure 1-1: Site Map Showing Report Limits**




# 2.0 Bellevue City Code Noise Limits

## 2.1 Exemptions Applicable to Train Noise

Chapter 9.18 of the Bellevue City Code states maximum permissible sound levels within the City, and exempts noise from most vehicles from these limits. BCC 9.18.020.A.7 exempts "Sounds created by motor vehicles when regulated by Chapter 173-62 of the WAC" (Washington Administrative Code. This chapter of the WAC defines motor vehicles as being "used primarily for transporting persons or property upon public highways and required to be licensed under RCW 46.16.010 . . ."

Since this WAC does not apply to light rail vehicles, BCC 9.18.020.A.7 does not exempt sounds from such vehicles. Instead, sounds from light rail transit vehicles are partially exempted from Chapter 9.18 by BCC 9.18.020.B.5, which exempts sounds created by the operation of all motor vehicles at all times when the receiving property is in a commercial or industrial zone (Class B or C EDNA), but only during certain hours when the receiving property is in a residential zone (Class A EDNA). In residential zones, sounds from the operation of light rail transit vehicles are exempted during the defined hours of 7 a.m. to 10 p.m. weekdays and 9 a.m. to 10 p.m. on weekends.

This noise report presents predicted noise levels from train operations at Class A EDNA properties during the defined nighttime hours of 10 p.m. to 7 a.m. when a 10 dBA maximum permissible sound level reduction is in effect per BCC 9.18.030.C. This report does not predict noise levels from 7 a.m. to 9 a.m.

on weekends because the 10 dBA maximum permissible sound level reduction for nighttime noise does not apply after 7 a.m. and the noise from train operations is predicted to comply with the maximum permissible sound levels defined by BCC 9.18.030.[1]

## 2.2 Maximum Permissible Sound Levels

The maximum permissible sound levels for residentially zoned properties are presented in BCC 9.18.030.B. The maximum permissible sound levels are reduced by 10 dBA during nighttime hours, from 10 p.m. to 7 a.m. (BCC 9.18.030.C.1) and are increased for short duration noise events (BCC 9.18.030.C.3). The duration of the train events is between 90 seconds and 5 minutes in one hour for peak hour train headways, which is considered a short duration noise event, so the maximum permissible noise levels increase by 10 dBA. The definition of the duration of a train event is presented in the following section for various train speeds.

The maximum permissible noise levels used in this analysis are presented in Table 2-1. The levels in the table include the 10 dB reduction for nighttime noise and a 10 dB increase for short duration events. The maximum permissible sound level is only presented for Class A EDNA receiving properties because LRT noise is exempt from the BCC noise limits for Class B and Class C EDNA receiving properties per BCC 9.18.020.B.5.

**Table 2-1: Maximum Permissible Sound Levels for Light Rail Vehicles**

| EDNA of Source | Maximum Permissible Sound Level for Class A EDNA Receiving Property, Leq(10pm to 7am), dBA |
|---|---|
| Class A | 55 dBA |
| Class B | 57 dBA |
| Class C | 60 dBA |
| Source: Bellevue City Code Chapter 9.18 | |

BCC 9.18.030 does not specify which noise metric applies to the maximum permissible sound levels. A noise metric is a descriptor of what the reported sound level represents, such as a maximum level or an average level over a given period of time. Two different noise metrics are defined in the noise code, Leq and Ldn. Ldn cannot be used for nighttime sound levels because it is, by definition, a 24-hour noise metric. This report therefore uses Leq as the noise metric.

Chapter 9.18 BCC also does not identify what time period should be used to model noise from train operations, and does not identify how the duration of train events should be defined. As explained below, this report uses a one-hour Leq and defines the duration of train events in a manner that is consistent with the FTA's guidance manual, in order to apply the code in a conservative manner that does not understate the noise from nighttime train operations.

[1] Even though the WAC and BCC do not discuss light rail vehicle noise nor specifically identify light rail vehicles as exempt, the light rail system is a linear transportation facility that provides public transportation in a public transportation right-of-way. Light rail is similar in character to the other transportation noise sources that are exempted by the WAC and BCC, and light rail meets the intent of the transportation exemption in these codes. In addition, the authors of this assessment are unaware of any other city or county that attempts to regulate noise from the operation of light rail transit vehicles using their local code. All other jurisdictions have relied on the FTA criteria as defined in the FTA Guidance Manual as the most appropriate method of analysis.

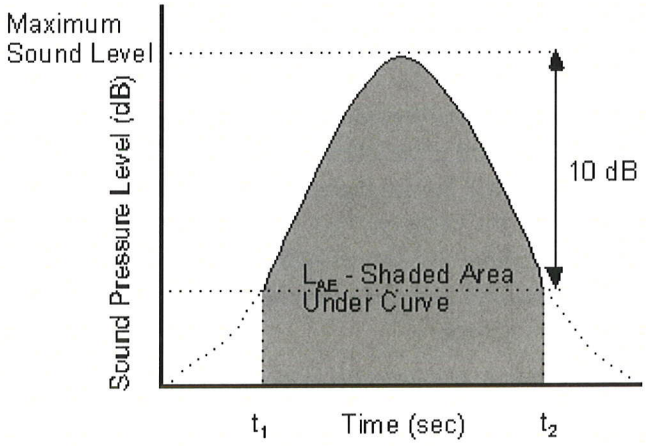
Leq is an energy average of the noise levels over a defined period of time. The noise code does not specify the period of time for the Leq. Since the noise code defines a maximum permissible noise level for nighttime hours and defines nighttime as the period between 10 p.m. to 7 a.m., it would be consistent with the code to use a 9-hour Leq corresponding to the nighttime period. However, light rail trains will not run throughout the night, and ambient noise will also be less during the middle of the night. This report therefore uses a 1-hour Leq to predict the noise from the train events during the two nighttime hours when the noise from trains will be most perceptible. For comparison purposes this report also models ambient noise during those two nighttime hours.

Using 1-hour Leq, this report predicts train noise for the 12 a.m. to 1 a.m. hour and the 6 a.m. to 7 a.m. hour. The 12 a.m. to 1 a.m. hour is the hour with the lowest ambient noise levels during which trains will be running. There will be 15 minute train headways during this hour. The 6 a.m. to 7 a.m. hour is the nighttime hour with the highest number of trains and therefore highest train noise 1-hour Leq. There will be eight-minute train headways during this hour. This report also presents the existing ambient 1-hr Leq during these same hours for reference.

## 2.3 Duration of Train Event

It is difficult to define train duration because it is not a fixed noise source, therefore the duration of the event will depend on train speed and train length. A possible definition for duration of a train event is to use the duration applied when calculating the sound exposure level (SEL). The SEL is a noise metric used in the FTA noise analysis and is defined in the FTA guidance manual as the level of sound accumulated over a given time interval or event. The FTA manual does not specifically state the duration of the time interval or event; however it is common practice to use the 10 dB down points to define the duration of the train event when determining the SEL. The 10 dB down points are the points before and after the maximum level that are 10 dB below the maximum. The Federal Highway Administration's Traffic Noise Model User's Guide states that as a minimum the SEL should encompass the 10 dB down points. In Figure 2-1, the 10 dB down points are at $t_1$ and $t_2$, and the duration of the event would be the time elapsed between $t_1$ and $t_2$. The time between the 10 dB down points could be interpreted as the acoustical duration of a train event.

**Figure 2-1: Noise Event Illustrating 10 dB Down Points**




Source: FHWA Traffic Noise Model Users Guide,

Table 2-2 shows the duration of train events using the 10 dB down point definition for a receiver at 50 feet and a 4-car train. The duration of the event using this definition does depend on the distance of the receiver from the tracks. The distance of 50 feet is commonly used as a reference distance for train noise events because the sound level at 50 feet generally exceeds the ambient noise level by at least 10 dB.

Table 2-2 shows the duration of a single train event and the duration of all train events for the hour with the most train events. The nighttime hour with the most train events is 6 a.m. to 7 a.m. During this hour the operating plan (see Table 3-2 below) shows 7.5 events in each direction, for this analysis this is rounded up to be 8 events in each direction resulting in a conservative total of 16 events in the hour. . The duration of train events in 1 hour for train speeds from 25 mph to 55 mph is between 1.5 minutes and 3.5 minutes. This duration corresponds to a 10 dBA increase to the maximum permissible sound levels for any receiving property per BCC 9.18.030.C.3.c. The 10 dBA increase is applied to the maximum permissible sound level for nighttime hours (10 p.m. to 7 a.m.).

**Table 2-2: Duration of Train Events for Different Train Speeds**

| Train Speed: | 55 mph | 50 mph | 45 mph | 40 mph | 25 mph |
|---|---|---|---|---|---|
| Train Length: | 380 ft. | 380 ft. | 380 ft. | 380 ft. | 380 ft. |
| Duration of 1 event (seconds): | 6.0 sec | 6.6 sec | 7.2 sec | 8.2 sec | 13.0 sec |
| Max events per hour[1]: | 16 | 16 | 16 | 16 | 16 |
| Duration of train events in 1-hour: | 1.6 min | 1.8 min | 1.9 min | 2.2 min | 3.5 min |
| [1]There are 15 scheduled events per hour, but the calculation assumes 16 events in order to be conservative... | | | | | |

The BCC does not define the duration of a train noise event and the definition presented in this section is not the only possible interpretation. An alternative interpretation is defining the time it takes the train to travel past a point. The duration of a train event using this alternative interpretation is the train length divided by the train speed, which would result in a shorter duration and therefore a higher permissible noise level (an increase of 15 dBA instead of 10 dBA per 9.18.030.C.3.c) for some train speeds than the definition of train duration adopted in this report.

## 2.4 Prediction Location

BCC 9.18.030.A states "the point of measurement shall be at the property boundary of the receiving property or anywhere within." Therefore, predicted noise levels should be presented at the location within the property where the noise will be the highest. In general, noise levels decrease with distance so the highest noise levels will be at the property line closest to the LRT tracks. However, when a sound wall is located close to the property line, the sound wall will provide the highest noise reduction at the property line and the noise level may be higher somewhere between the property line and the building facade where the sound wall is less effective.

To illustrate this point, Table 2-3 shows the difference in noise reduction for a sound barrier placed 20 feet from the LRT tracks and a barrier placed close to the property line (55 feet from the LRT tracks), where the property line is 60 feet from the track. The calculations assume flat topography and an 8 feet barrier height.

As shown in Table 2-3, the predicted noise reduction for the barrier located close to (20 feet from) the tracks has very little variation with distance. Noise levels decrease with distance; therefore, the highest noise level is expected to be at the property line and not at the building facade. However, for the barrier located close to the property line (55 feet from the tracks), noise levels may be higher at 100 feet compared to the 60 feet position, because the sound barrier is about 4 decibels less effective.

**Table 2-3: Effect of Sound Barrier Location on Noise Reduction**

| Distance to Measurement Position | Predicted Noise Reduction for barrier located 20 ft. from tracks, dB | Predicted Noise Reduction for barrier located 55 ft. from tracks, dB |
|---|---|---|
| 60 ft. | 12.6 | 13.3 |
| 70 ft. | 12.6 | 10.5 |
| 80 ft. | 12.5 | 9.6 |
| 90 ft. | 12.5 | 9.1 |
| 100 ft. | 12.5 | 8.9 |
| Note: Predicted noise reduction from barrier assumes 8 ft. barrier height and flat topography. | | |

Any location on a receiving property further away from the LRT track than the building structure will receive noise reduction from acoustical shielding from the structure itself. Therefore, noise predictions are presented at the building facade on the property for parcels where a sound wall is located close to the property line. The prediction location (property line or building facade) is indicated in the footnote in the bottom row of Table 4-1.

# 3.0 Noise Impact Assessment Methodology

The noise from light-rail vehicle (LRV) operations is predicted using the FTA detailed noise analysis procedure presented in the FTA Transit Noise and Vibration Impact Assessment guidance manual[2]. The FTA detailed noise analysis procedure is a spreadsheet model that uses formulas presented in the FTA guidance manual. The formulas take into account the following specific operating characteristics of the Sound Transit system:

- Measured reference sound level of existing Sound Transit LRVs,
- train operating schedule,
- train speed, and
- track structure

ATS Consulting took reference sound level measurements on the existing ST Central Link light-rail system in April 2013[3]. Measurements were taken on at-grade, ballast-and-tie track and on direct-fixation track on an aerial structure. The measurements were made using a 3-car train consist traveling at controlled speeds during non-revenue service hours and measurements of 2-car train consists during regular revenue service hours. The results of the noise measurements showed maximum noise levels from the light rail vehicle of 79 dBA at 50 feet and 40 mph. The noise levels on the Central Link system

[2] FTA-VA-90-1003-06. May 2006.

[3] The sound level measurements of the existing ST Central Link light-rail system are documented in the report: *Noise Measurements of Existing Sound Transit Trains* dated October 16, 2013.

are about 2 decibels higher than the FTA reference noise level for LRVs. The measured maximum noise levels of the existing light rail vehicle was converted to a reference sound exposure level (SEL) which is the train passby compressed into a 1-second period. The SEL used for the predictions in this analysis is 84 dBA at 50 feet for a one-car train traveling at 50 mph for ballast-and-tie track (2 decibels higher than the FTA reference level of 82 dBA). The measured reference levels for ballast-and-tie track and direct fixation track are shown in Table 3-1.

**Table 3-1: Measured SEL Reference Levels**

| Track-type | SEL Reference Level, dBA[1] |
|---|---|
| Ballast-and-Tie | 84 |
| Direct Fixation | 88 |
| [1]SEL reference level is for a one-car train traveling at 50 mph at 50 ft. | |

The train schedule from Sound Transit's Revised 2035 Light Rail Operation Plans, shown in Table 3-2, was used for the noise predictions. Note that the revised 2035 operating schedule is different than the assumptions used in the Final EIS predictions. The revised operating schedule assumes 8 minute peak headways and 4-car train consists, while the Final EIS schedule assumed 7-minute peak headways and 3-car train consists. The operating speeds and track structure type assumed in the predictions are based on the information in the 60% design drawings.

**Table 3-2: East Link Operating Plan**

| Hours | Headway (minutes) | Total Eastbound and Westbound Trains |
|---|---|---|
| 5-6 a.m. | 15 | 4 |
| 6-7 a.m. | 8 | 7.5 |
| 7-8:30 a.m. | 8 | 11.25 |
| 8:30 a.m.-3:00 p.m. | 10 | 39 |
| 3-6:30 p.m. | 8 | 26.25 |
| 6:30-10 p.m. | 10 | 21 |
| 10 p.m.-1:00 a.m. | 15 | 12 |
| 1-5 a.m. | 0 | 0 |
| Total Nighttime (10 p.m. - 7 a.m.) | - | 23.5[1] |
| Notes: Schedule is for trains in one direction.<br>[1]Total number of nighttime trains in one direction is rounded up to 24 when calculating predicted noise levels. | | |

In addition to the operating characteristics of the system, the noise formulas also account for distance from the sensitive receiver to the tracks, ground absorption effects, and noise reduction from barriers recommended in the final design noise mitigation analysis using the FTA noise impact thresholds. The sound barrier lengths and locations recommended in the final design noise mitigation analysis are summarized in Table 3-3. The locations of the barriers are shown in Figure 6-1 through Figure 6-12 in Appendix B.

**Table 3-3: Recommended Sound Wall Lengths and Heights from FTA Noise Impact Analysis**

| Wall | Start Station | End Station | Wall Length | Wall Height | Wall Location | Comments |
|---|---|---|---|---|---|---|
| 1WB | 380+19 (E130)<br>405+32 (E320) | 456+00 | 5,100 ft. | 6 ft. above top of rail | On WB edge of aerial guideway | |
| | 456+00 | 459+26 | 326 ft. | 8 ft. above top of rail | On WB edge of aerial guideway | |
| | 459+26 | 460+29 | 103 ft. | 8 ft. above Bellevue Way Grade | At street level, adjacent to west trench edge | Wall height tapers as trench depth increases |
| | 460+29 | 460+80 | 51 ft. | 6 ft. above Bellevue Way Grade | At street level, adjacent to west trench edge | |
| | 460+80 | 462+24 | 144 ft. | 4 ft. above Bellevue Way Grade | At street level, adjacent to west trench edge | |
| 1EB | 407+00 | 418+00 | 1,100 ft. | 4 ft. above top of rail | On EB edge of aerial guideway | |
| 2 | 476+00 | 479+00 | 300 ft | Varies 6 ft. to 10 ft. above top of rail | At WB edge of guideway | |
| | 479+00 | 491+00 | 1,200 ft. | 10 ft. above top of rail | At WB edge of guideway | |
| | 491+00 | 496+00 | 500 ft. | 6 ft. above top of rail | At WB edge of guideway | |
| 3 | 500+00<br>(north portal of road-over-rail) | 508+00 | 800 ft. | 10 ft. above top of rail | At WB edge of guideway | The wall height is the combined retaining wall and sound wall height. |
| | 508+00 | 509+50 | 150 ft. | 12 ft. above top of rail | At WB edge of guideway | |
| | 509+50 | 511+00 | 150 ft. | 14 ft. above top of rail | At WB edge of guideway | |
| | 511+00 | 512+00 | 100 ft. | 12 ft. above top of rail | At WB edge of guideway | |
| | 512+00 | 514+00 | 200 ft. | 10 ft. above top of rail | At WB edge of guideway | |
| 4 | 520+00 | 522+50 (intersection with SE 4th St) | 250 ft. | 8 ft. above top of rail | At WB edge of guideway | |
| | 522+50 | 522+80 | 30 ft. | 8 ft. above top of rail | Moveable gate a maximum of 10 feet from the WB track | |
| | 522+80 (intersection with SE 4th St) | 523+20 | 40 ft. | 8 ft. above top of rail | At WB edge of guideway | |
| | 523+20 | 523+20 | 70 ft. | 8 ft. above ground level | Wall will run perpendicular to the track until it reaches the ROW line | |
| | 523+20 | 531+55 (E335 stationing) | 835 ft. | 6 ft. above ground level at ROW line | Along WB ROW line | Wall will be located at ROW line |
| | 531+55 (E335 stationing) | 540+15 (south tunnel portal) | 860 ft. | 6 ft. above ground level at ROW line | Along WB ROW line | This section of wall is included in E335 package |

# 4.0 Noise Impact Assessment

This section presents a detailed noise impact analysis of light-rail vehicle operations. Table 4.1 states the predicted nighttime noise levels with the noise mitigation required by the Record of Decision, and compares these noise levels with the maximum permissible noise levels defined in the Bellevue City Code, which is discussed in Section 2.0. Predicted nighttime noise levels exceed the maximum permissible noise level at two parcels, EL133 and EL148. Sound Transit therefore has proposed additional mitigation, as explained in section 4.2, over and above what is required by the Record of Decision, and this additional mitigation will bring the noise levels at these parcels into compliance with the Code.

## 4.1 Predicted Nighttime Noise from LRVs

Table 4-1 presents the predicted nighttime noise levels for Class A EDNA land uses within the E320 contract limits. Each Class A parcel is identified in the first column of the table. Table 6-1 in Appendix B is a list of all parcel labels and corresponding street addresses. Figure 6-1 through Figure 6-12 in Appendix B show the location of all parcels with respect to the light-rail tracks, as well as the sound walls included in the analysis.

The predicted nighttime noise levels, with the mitigation required by the Record of Decision, exceed the impact threshold at two parcels: EL133 and EL148. Mitigation measures for the noise impacts at these two parcels are presented in Section 4.2.

**Table 4-1: Predicted Nighttime Noise Levels, with FTA Mitigation Included**

| Parcel | Distance[1] (ft) | Speed (mph) | 12am to 1 am | | | | 6am to 7am | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Ambient Noise Level, Leq(12am-1am)[2], dBA | Predicted Train Noise, Leq(12am-1am)[3] dBA | Nighttime Impact Threshold, Leq(1-hr)[4], dBA | Amount Exceeds Threshold, dBA | Ambient Noise Level, Leq(6am-7am)[2], dBA | Predicted Train Noise, Leq(6am-7am)[3] dBA | Nighttime Impact Threshold, Leq(1-hr)[4], dBA | Amount Exceeds Threshold, dBA |
| EL100d | 260 | 45 | 52 | 52 | 55 | -3 | 60 | 55 | 55 | 0 |
| EL100e | 281 | 45 | 53 | 52 | 55 | -3 | 61 | 55 | 55 | 0 |
| EL100f | 271 | 45 | 53 | 52 | 55 | -3 | 61 | 55 | 55 | 0 |
| EL100g | 260 | 45 | 53 | 52 | 55 | -3 | 61 | 55 | 55 | 0 |
| EL100h | 253 | 45 | 53 | 52 | 55 | -3 | 61 | 55 | 55 | 0 |
| EL100i | 230 | 45 | 54 | 49 | 55 | -6 | 62 | 52 | 55 | -3 |
| EL100j | 228 | 45 | 54 | 48 | 55 | -7 | 62 | 51 | 55 | -4 |
| EL100k | 260 | 45 | 53 | 49 | 55 | -6 | 61 | 52 | 55 | -3 |
| EL100l | 270 | 45 | 50 | 48 | 55 | -7 | 59 | 51 | 55 | -4 |
| EL100m | 270 | 45 | 52 | 47 | 55 | -8 | 60 | 50 | 55 | -5 |
| EL100n | 300 | 45 | 52 | 46 | 55 | -9 | 60 | 49 | 55 | -6 |
| EL100o | 302 | 45 | 53 | 45 | 55 | -10 | 61 | 48 | 55 | -7 |
| EL100p | 305 | 45 | 53 | 44 | 55 | -11 | 61 | 47 | 55 | -8 |
| EL101f | 240 | 45 | ***62*** | 51 | 55 | -4 | 70 | 54 | 55 | -1 |
| EL101g | 230 | 45 | 62 | 52 | 55 | -3 | 70 | 55 | 55 | 0 |

| Parcel | Distance[1] (ft) | Speed (mph) | 12am to 1 am | | | | 6am to 7am | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Ambient Noise Level, Leq(12am-1am)[2], dBA | Predicted Train Noise, Leq(12am-1am)[3] dBA | Nighttime Impact Threshold, Leq(1-hr)[4], dBA | Amount Exceeds Threshold, dBA | Ambient Noise Level, Leq(6am-7am)[2], dBA | Predicted Train Noise, Leq(6am-7am)[3] dBA | Nighttime Impact Threshold, Leq(1-hr)[4], dBA | Amount Exceeds Threshold, dBA |
| EL101h | 260 | 45 | 61 | 52 | 55 | -3 | 70 | 55 | 55 | 0 |
| EL101i | 263 | 45 | 60 | 52 | 55 | -3 | 68 | 55 | 55 | 0 |
| EL101j | 242 | 45 | 62 | 50 | 55 | -5 | 70 | 53 | 55 | -2 |
| EL101k | 235 | 45 | ***61*** | 49 | 55 | -6 | ***70*** | 52 | 55 | -3 |
| EL101l | 248 | 45 | 62 | 49 | 55 | -6 | 71 | 52 | 55 | -3 |
| EL101m | 263 | 45 | 61 | 49 | 55 | -6 | 70 | 52 | 55 | -3 |
| EL101n | 284 | 45 | 61 | 49 | 55 | -6 | 70 | 52 | 55 | -3 |
| EL101o | 260 | 45 | 61 | 49 | 55 | -6 | 70 | 52 | 55 | -3 |
| EL101p | 195 | 35 | 56 | 46 | 55 | -9 | 68 | 49 | 55 | -6 |
| EL101q | 184 | 35 | 55 | 47 | 55 | -8 | 68 | 50 | 55 | -5 |
| EL101r | 135 | 35 | 55 | 48 | 55 | -7 | 68 | 51 | 55 | -4 |
| EL101s | 120 | 35 | 52 | 48 | 55 | -7 | 65 | 51 | 55 | -4 |
| EL101t | 110 | 35 | 54 | 48 | 55 | -7 | 67 | 51 | 55 | -4 |
| EL101u | 105 | 35 | 54 | 48 | 55 | -7 | 67 | 51 | 55 | -4 |
| EL101v | 115 | 35 | 56 | 48 | 55 | -7 | 69 | 51 | 55 | -4 |
| EL101x | 120 | 35 | 54 | 48 | 55 | -7 | 67 | 51 | 55 | -4 |
| EL101w | 130 | 35 | 54 | 48 | 55 | -7 | 67 | 51 | 55 | -4 |
| EL101y | 105 | 35 | 58 | 49 | 55 | -6 | 71 | 52 | 55 | -3 |

| Parcel | Distance[1] (ft) | Speed (mph) | 12am to 1 am | | | | 6am to 7am | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Ambient Noise Level, Leq(12am-1am)[2], dBA | Predicted Train Noise, Leq(12am-1am)[3] dBA | Nighttime Impact Threshold, Leq(1-hr)[4], dBA | Amount Exceeds Threshold, dBA | Ambient Noise Level, Leq(6am-7am)[2], dBA | Predicted Train Noise, Leq(6am-7am)[3] dBA | Nighttime Impact Threshold, Leq(1-hr)[4], dBA | Amount Exceeds Threshold, dBA |
| EL101z | 170 | 35 | 53 | 47 | 55 | -8 | 66 | 50 | 55 | -5 |
| EL103 | 165 | 35 | 60 | 49 | 55 | -6 | 67 | 52 | 55 | -3 |
| EL104 | 165 | 35 | 55 | 47 | 55 | -8 | 62 | 50 | 55 | -5 |
| EL106 | 160 | 35 | 55 | 47 | 55 | -8 | 62 | 50 | 55 | -5 |
| EL107 | 180 | 35 | 59 | 47 | 55 | -8 | 66 | 50 | 55 | -5 |
| EL108 | 216 | 35 | 56 | 46 | 55 | -9 | 63 | 49 | 55 | -6 |
| EL109 | 233 | 30 | ***53*** | 46 | 55 | -9 | ***60*** | 49 | 55 | -6 |
| EL110 | 285 | 30 | 58 | 47 | 55 | -8 | 65 | 50 | 55 | -5 |
| EL112 | 247 | 30 | 54 | 47 | 55 | -8 | 61 | 50 | 55 | -5 |
| EL114 | 226 | 40 | 57 | 46 | 55 | -9 | 64 | 49 | 55 | -6 |
| EL113 | 287 | 40 | 54 | 45 | 55 | -10 | 61 | 48 | 55 | -7 |
| EL115 | 195 | 40 | ***58*** | 46 | 55 | -9 | ***69*** | 49 | 55 | -6 |
| EL117 | 146 | 40 | 57 | 48 | 55 | -7 | 68 | 51 | 55 | -4 |
| EL118 | 130 | 40 | 56 | 48 | 55 | -7 | 67 | 51 | 55 | -4 |
| EL119 | 120 | 40 | 58 | 48 | 55 | -7 | 69 | 51 | 55 | -4 |
| EL121 | 105 | 40 | 56 | 49 | 55 | -6 | 67 | 52 | 55 | -3 |
| EL122 | 100 | 40 | 49 | 49 | 55 | -6 | 61 | 52 | 55 | -3 |
| EL124 | 92 | 40 | 47 | 49 | 55 | -6 | 59 | 52 | 55 | -3 |

| Parcel | Distance[1] (ft) | Speed (mph) | 12am to 1 am | | | | 6am to 7am | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Ambient Noise Level, Leq(12am-1am)[2], dBA | Predicted Train Noise, Leq(12am-1am)[3] dBA | Nighttime Impact Threshold, Leq(1-hr)[4], dBA | Amount Exceeds Threshold, dBA | Ambient Noise Level, Leq(6am-7am)[2], dBA | Predicted Train Noise, Leq(6am-7am)[3] dBA | Nighttime Impact Threshold, Leq(1-hr)[4], dBA | Amount Exceeds Threshold, dBA |
| EL125 | 85 | 40 | 49 | 50 | 55 | -5 | 60 | 53 | 55 | -2 |
| EL126 | 80 | 40 | ***50*** | 50 | 55 | -5 | ***61*** | 53 | 55 | -2 |
| EL127 | 80 | 40 | 50 | 50 | 55 | -5 | 60 | 53 | 55 | -2 |
| EL129 | 72 | 45 | 51 | 50 | 55 | -5 | 61 | 53 | 55 | -2 |
| EL130 | 63 | 45 | 52 | 50 | 55 | -5 | 63 | 53 | 55 | -2 |
| EL131 | 70 | 45 | 52 | 50 | 55 | -5 | 63 | 53 | 55 | -2 |
| EL132 | 70 | 45 | 49 | 52 | 55 | -3 | 59 | 55 | 55 | 0 |
| EL133 | 70 | 45 | 49 | 53 | 55 | -2 | 60 | 56 | 55 | 1 |
| EL134 | 70 | 45 | 49 | 52 | 55 | -3 | 60 | 55 | 55 | 0 |
| EL135 | 70 | 45 | ***51*** | 52 | 55 | -3 | ***62*** | 55 | 55 | 0 |
| EL137 | 75 | 45 | 50 | 52 | 55 | -3 | 61 | 55 | 55 | 0 |
| EL138 | 75 | 45 | 60 | 52 | 55 | -3 | 68 | 55 | 55 | 0 |
| EL139 | 75 | 45 | 60 | 52 | 55 | -3 | 68 | 55 | 55 | 0 |
| EL140 | 75 | 45 | 61 | 52 | 55 | -3 | 69 | 55 | 55 | 0 |
| EL142 | 85 | 45 | 57 | 51 | 55 | -4 | 64 | 54 | 55 | -1 |
| EL143 | 85 | 45 | ***59*** | 51 | 55 | -4 | ***66*** | 54 | 55 | -1 |
| EL144 | 95 | 45 | 59 | 51 | 55 | -4 | 67 | 54 | 55 | -1 |
| EL145 | 115 | 45 | 59 | 50 | 55 | -5 | 66 | 53 | 55 | -2 |

| Parcel | Distance[1] (ft) | Speed (mph) | 12am to 1 am | | | | 6am to 7am | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Ambient Noise Level, Leq(12am-1am)[2], dBA | Predicted Train Noise, Leq(12am-1am)[3] dBA | Nighttime Impact Threshold, Leq(1-hr)[4], dBA | Amount Exceeds Threshold, dBA | Ambient Noise Level, Leq(6am-7am)[2], dBA | Predicted Train Noise, Leq(6am-7am)[3] dBA | Nighttime Impact Threshold, Leq(1-hr)[4], dBA | Amount Exceeds Threshold, dBA |
| EL148 | 125 | 45 | 59 | 55 | 57[5] | -2 | 66 | 58 | 57 | 1 |
| EL149a | 140 | 45 | 53 | 40 | 57[5] | -17 | 56 | 43 | 57 | -14 |
| EL149b | 147 | 45 | 53 | 40 | 57[5] | -17 | 56 | 43 | 57 | -14 |
| EL149c | 160 | 45 | ***50*** | 40 | 57[5] | -17 | ***54*** | 43 | 57 | -14 |
| 149d | 165 | 45 | 50 | 40 | 57[5] | -17 | 54 | 43 | 57 | -14 |
| EL149e | 170 | 45 | 51 | 40 | 57[5] | -17 | 55 | 43 | 57 | -14 |
| EL149f | 155 | 45 | 50 | 41 | 57[5] | -16 | 54 | 44 | 57 | -13 |
| EL149g | 227 | 45 | 48 | 41 | 57[5] | -16 | 52 | 44 | 57 | -13 |
| EL149h | 263 | 45 | 48 | 39 | 57[5] | -18 | 52 | 42 | 57 | -15 |
| EL151 | 115 | 45 | ***54*** | 49 | 57[5] | -8 | ***62*** | 52 | 57 | -5 |
| EL155 | 38 | 45 | 52 | 50 | 55 | -5 | 61 | 53 | 55 | -2 |
| EL156 | 148 | 45 | 48 | 43 | 55 | -12 | 56 | 46 | 55 | -9 |
| EL158 | 188 | 45 | 47 | 40 | 55 | -15 | 55 | 43 | 55 | -12 |
| EL160 | 85 | 55 | 50 | 45 | 55 | -10 | 58 | 48 | 55 | -7 |
| EL161 | 65 | 55 | 51 | 47 | 55 | -8 | 59 | 50 | 55 | -5 |
| EL163 | 40 | 55 | 52 | 50 | 55 | -5 | 60 | 53 | 55 | -2 |
| EL164 | 56 | 55 | 51 | 50 | 55 | -5 | 59 | 53 | 55 | -2 |
| EL165 | 53 | 55 | 51 | 48 | 55 | -7 | 59 | 51 | 55 | -4 |

| Parcel | Distance[1] (ft) | Speed (mph) | 12am to 1 am | | | | 6am to 7am | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Ambient Noise Level, Leq(12am-1am)[2], dBA | Predicted Train Noise, Leq(12am-1am)[3] dBA | Nighttime Impact Threshold, Leq(1-hr)[4], dBA | Amount Exceeds Threshold, dBA | Ambient Noise Level, Leq(6am-7am)[2], dBA | Predicted Train Noise, Leq(6am-7am)[3] dBA | Nighttime Impact Threshold, Leq(1-hr)[4], dBA | Amount Exceeds Threshold , dBA |
| EL166 | 60 | 55 | 51 | 49 | 55 | -6 | 59 | 52 | 55 | -3 |
| EL167 | 44 | 55 | 51 | 52 | 55 | -3 | 60 | 55 | 55 | 0 |
| EL169 | 116 | 55 | 48 | 49 | 55 | -6 | 57 | 52 | 55 | -3 |
| EL174 | 93 | 55 | 57 | 45 | 55 | -10 | 60 | 48 | 55 | -7 |
| EL179 | 80 | 55 | 58 | 46 | 55 | -9 | 60 | 49 | 55 | -6 |
| EL181 | 150 | 55 | 56 | 42 | 55 | -13 | 58 | 45 | 55 | -10 |
| EL182 | 135 | 55 | 56 | 42 | 55 | -13 | 59 | 45 | 55 | -10 |
| EL183 | 118 | 55 | 56 | 43 | 55 | -12 | 59 | 46 | 55 | -9 |
| EL184 | 110 | 45 | 56 | 42 | 55 | -13 | 59 | 45 | 55 | -10 |

Notes:

[1]The distance in feet. For parcels EL100d to EL151, the distance is to the property line. For parcels EL155 to EL184, the distance is to the building facade, because the predicted noise level is higher at the building facade than at the property line due to the location of the sound wall

[2] Ambient noise levels shown in bold italics are the parcels where the noise level was measured. At all other parcels the ambient noise level was estimated based on the nearest measurement and the relative distances to the roadway.

[3]Predicted train noise for 12am to 1am assumes 15 minute headways. Predicted train noise for 6am to 7am assumes 8 minute headways.

[4]Nighttime impact threshold is from the maximum permissible sound levels from the BCC applicable to train noise received in residential properties.

[5]The EDNA of source for the LRT alignment adjoining these parcels is Category B.

## 4.2 Summary of Predicted Impacts and Mitigation Measures

The predicted noise levels exceed the Bellevue City Code noise limit at two parcels, EL148 and EL133. The predicted noise level can be mitigated to below the BCC noise limit by extending the sound wall at parcel EL148 and providing sound absorptive treatment to the walls of the trench walls at parcel EL133. The sound absorptive treatment shall be 1" thick acoustical vermiculite cement plaster (AVCP) in accordance with E320 Specification Section 09 82 19, Sprayed Acoustic Insulation applied to the walls of the trench. Table 4-2 presents the impacted parcels, the mitigation recommendation, and the predicted mitigated sound level. The predicted mitigated sound level for both parcels is below the BCC noise limit of 55 dBA, Leq(nighttime).

**Table 4-2: Summary of Predicted Impacts and Mitigation Measures**

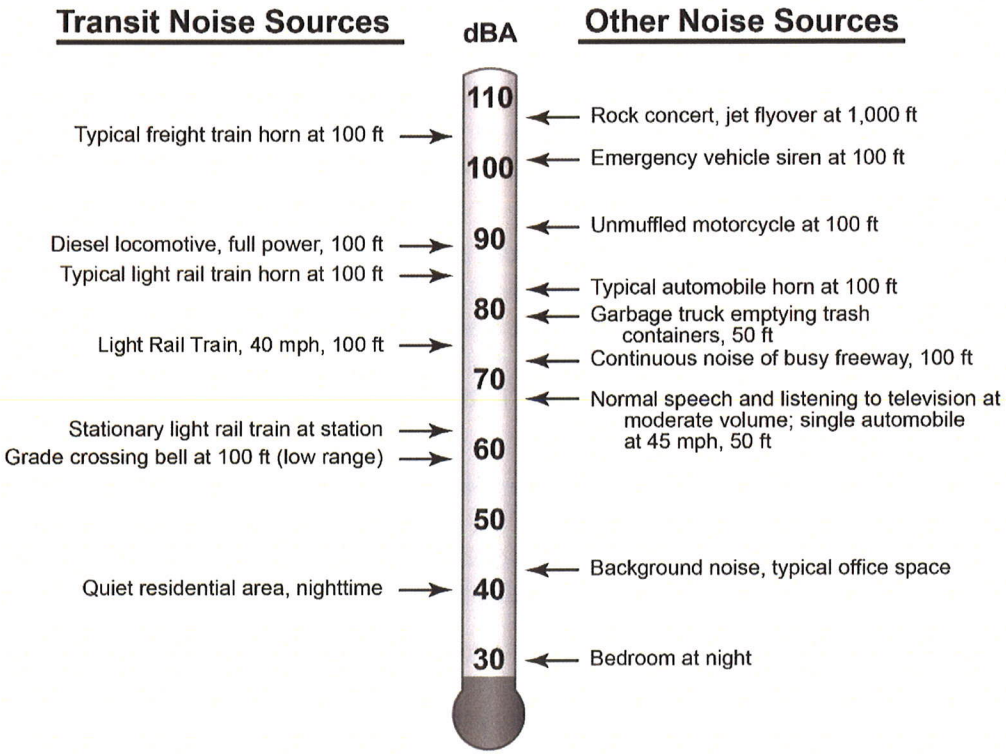
| Parcel | Predicted Level , Leq(nighttime), dBA | Recommended Mitigation | Predicted Mitigated Sound Level, Leq(nighttime), dBA |
|---|---|---|---|
| EL133 | 56 dBA | 1" thick AVCP sprayed on to the walls of the trench from EB Sta. 463+00 to the Parking Entrance Lid of the Trench at EB Sta. 465+91 | 54 dBA |
| EL148 | 58 dBA | Extend Wall 2 from WB 479+00 to WB 476+00 (300 feet). Height above top of rail varies from 6 feet at WB 476+00 to 10 feet at WB 479+00 | 48 dBA |

# 5.0 Appendix A: Background on Noise

Sound is mechanical energy transmitted by pressure waves in a compressible medium such as air. Noise is generally defined as unwanted or excessive sound. Sound can vary in intensity by over one million times within the range of human hearing. Therefore, a logarithmic scale, known as the decibel scale (dB), is used to quantify sound intensity and compress the scale to a more convenient range.

Sound is characterized by both its amplitude and frequency (or pitch). The human ear does not hear all frequencies equally. In particular, the ear deemphasizes low and very high frequencies. To better approximate the sensitivity of human hearing, the A-weighted decibel scale has been developed. A-weighted decibels are abbreviated as "dBA." On this scale, the human range of hearing extends from approximately 3 dBA to around 140 dBA. As a point of reference, Figure A-1includes examples of A-weighted sound levels from common indoor and outdoor sounds.

**Figure 5-1: Typical Noise Levels**




Using the decibel scale, sound levels from two or more sources cannot be directly added together to determine the overall sound level. Rather, the combination of two sounds at the same level yields an increase of 3 dB. The smallest recognizable change in sound level is approximately 1 dB. A 3-dB increase in the A-Weighted sound level is generally considered perceptible, whereas a 5-dB increase is readily perceptible. A 10-dB increase is judged by most people as an approximate doubling of the perceived loudness.

The two primary factors that reduce levels of environmental sounds are increasing the distance between the sound source and the receiver and having intervening obstacles such as walls, buildings, or terrain features that block the direct path between the sound source and the receiver. Factors that act to make environmental sounds louder include moving the sound source closer to the receiver, sound enhancements caused by reflections, and focusing caused by various meteorological conditions.

Following are brief definitions of the measures of environmental noise used in this study:

- *Maximum Sound Level ($L_{max}$):* $L_{max}$ is the maximum sound level that occurs during an event such as a train passing. For this analysis $L_{max}$ is defined as the maximum sound level using the slow setting on a standard sound level meter.
- *Equivalent Sound Level ($L_{eq}$):* Environmental sound fluctuates constantly. The equivalent sound level ($L_{eq}$) is the most common means of characterizing community noise. $L_{eq}$ represents a constant sound that, over a specified period of time, has the same sound energy as the time-varying sound. $L_{eq}$ is used by the FTA to evaluate noise effects at institutional land uses, such as schools, churches, and libraries, from proposed transit projects.
- *Day-Night Sound Level ($L_{dn}$):* $L_{dn}$ is basically a 24-hour $L_{eq}$ with an adjustment to reflect the greater sensitivity of most people to nighttime noise. The adjustment is a 10 dB penalty for all sound that occurs between the hours of 10:00 p.m. to 7:00 a.m. The effect of the penalty is that, when calculating $L_{dn}$, any event that occurs during the nighttime is equivalent to ten occurrences of the same event during the daytime. $L_{dn}$ is the most common measure of total community noise over a 24-hour period and is used by the FTA to evaluate residential noise effects from proposed transit projects.
- *$L_{XX}$:* This is the percent of time a sound level is exceeded during the measurement period. For example, the $L_{99}$ is the sound level exceeded during 99 percent of the measurement period. For a 1-hour period, $L_{99}$ is the sound level exceeded for all except 36 seconds of the hour. $L_1$ represents typical maximum sound levels, $L_{33}$ is approximately equal to $L_{eq}$ when free-flowing traffic is the dominant noise source, $L_{50}$ is the median sound level, and $L_{99}$ is close to the minimum sound level.
- *Sound Exposure Level (SEL):* SEL is a measure of the acoustic energy of an event such as a train passing. In essence, the acoustic energy of the event is compressed into a 1-second period. SEL increases as the sound level of the event increases and as the duration of the event increases. It is often used as an intermediate value in calculating overall metrics such as $L_{eq}$ and $L_{dn}$.
- *Sound Transmission Class (STC):* STC ratings are used to compare the sound insulating effectiveness of different types of noise barriers, including windows, walls, etc. Although the amount of attenuation varies with frequency, the STC rating provides a rough estimate of the transmission loss from a particular window or wall.

# 6.0 Appendix B: Parcel Table and Parcel Figures

Table 6-1 lists the addresses of the parcels that are referenced in this report. Figures 6-1 through 6-12 identify the proposed sound walls and the additions to the walls that this report recommends to achieve compliance with the Bellevue Noise Code. For convenience, these figures also identify "Noise Sensitive Receivers" as defined by the Federal Transit Authority by parcel number.

**Table 6-1: List of Parcel Numbers and Corresponding Addresses**

| Parcel | Address |
|---|---|
| EL100a | unknown |
| EL100b | 10811 SE Lake |
| EL100c | 10815 SE Lake Rd |
| EL100d | 10825 SE Lake Rd |
| EL100e | 10831 SE Lake Rd |
| EL100f | 10835 SE Lake Rd |
| EL100g | 10843 SE Lake Rd |
| EL100h | 10845 SE Lake Rd |
| EL100i | 10925 SE Lake Rd |
| EL100j | 11003 SE Lake Rd |
| EL100k | 11011 SE Lake Rd |
| EL100l | 11015 SE Lake Rd |
| EL100m | 11041 SE Lake Rd |
| EL100n | 11055 SE Lake Rd |
| EL100o | unknown |
| EL100p | 11205 SE Lake Rd |
| EL101a | 3265 106th Ave SE |
| EL101b | 3273 106th Ave SE |
| EL101c | 3461 108th Ave SE |
| EL101d | 3230 108th Ave SE |
| EL101e | 3247 109th Ave SE |
| EL101f | 3246 109th Ave SE |
| EL101g | 3245 110th Ave SE |
| EL101h | 3242 110th Ave SE |
| EL101i | 11026 SE 34th St |
| EL101j | 3255 111th Ave SE |
| EL101k | 3264 111th Ave SE |
| EL101l | 3265 112th Ave SE |
| EL101m | 3264 112th Ave SE |
| EL101n | 1162 SE 35TH ST |
| EL101o | 3263 113th Ave SE |
| EL101p | 3244 113th Ave SE |

| Parcel | Address |
|---|---|
| EL101q | 3236 113th Ave SE |
| EL101r | unknown |
| EL101s | 3218 113th Ave SE |
| EL101t | 3214 113th Ave SE |
| EL101u | 3108 113th Ave SE |
| EL101v | 3110 113th Ave SE |
| EL101x | 3018 113th Ave SE |
| EL101w | 3014 113th Ave SE |
| EL101y | 3005 Bellevue Way SE |
| EL101z | 11234 SE 30th St |
| EL103 | 11230 SE 30TH STREET |
| EL104 | 2831 BELLEVUE WAY SE |
| EL106 | 2811 BELLEVUE WAY SE |
| EL107 | 2821 BELLEVUE WAY SE |
| EL108 | 2809 BELLEVUE WAY SE |
| EL109 | 2705 BELLEVUE WAY SE |
| EL110 | 11047 SE 27TH PL |
| EL112 | 11048 SE 27TH PL |
| EL113 | 11044 SE 27TH PL |
| EL114 | unknown |
| EL115 | 2548 111TH AVE SE |
| EL117 | 2532 111TH AVE SE |
| EL118 | 2522 111TH AVE SE |
| EL119 | 2508 111TH AVE SE |
| EL121 | 11038 SE 25TH ST |
| EL122 | 11024 SE 25TH ST |
| EL124 | 11017 SE 24TH PL |
| EL125 | 11023 SE 24TH PL |
| EL126 | 11022 SE 24TH PL |
| EL127 | 11016 SE 24TH PL |
| EL129 | 10923 SE 23rd Street |
| EL130 | 10929 SE 23rd Street |
| EL131 | 10935 SE 23rd Street |
| EL132 | 2234 109th Avenue SE |
| EL133 | 2228 109th Avenue SE |
| EL134 | 2222 109th Avenue SE |
| EL135 | 2216 109th Avenue SE |
| EL137 | 2128 109th Avenue SE |
| EL138 | 2113 Bellevue Way SE |
| EL139 | 2105 Bellevue Way SE |
| EL140 | 1997 Bellevue Way SE |

| Parcel | Address |
|---|---|
| EL142 | 1928 109TH AVE SE |
| EL143 | 1922 109th Avenue SE |
| EL144 | 1914 109TH AVE SE |
| EL145 | 1906 109TH AVE SE |
| EL148 | 1800 108th Avenue SE |
| EL149a | 1650 109TH AVE SE |
| EL149b | 1638 109th Ave SE |
| EL149c | 1632 109th Ave SE |
| 149d | 1624 109th Ave SE |
| EL149e | 1612 109th Ave SE |
| EL149f | 1600 109th Ave SE |
| EL149g | 10839 SE 14th St |
| EL149h | 1432 109th Ave SE |
| EL151 | 1101 BELLEFIELD PARK LN |
| EL155 | 1018 111TH PL SE |
| EL156 | 1020 112TH AVE SE |
| EL158 | 1022 111TH PL SE |
| EL160 | 1012 11TH PL SE |
| EL161 | 1006 111TH PL SE |
| EL163 | 932 111TH PL SE |
| EL164 | 924 111TH PL SE |
| EL165 | 918 111TH PL SE |
| EL166 | 912 111TH PL SE |
| EL167 | 906 111TH PL SE |
| EL169 | 807 111TH PL SE |
| EL174 | 11121 SE 4TH ST |
| EL179 | 11116 SE 4TH ST |
| EL181 | 322 111TH AVE SE |
| EL182 | 314 111TH AVE SE |
| EL183 | 308 111TH AVE SE |
| EL184 | 300 111TH AVE SE |
| EL186 | 248 111TH AVE SE |
| EL187 | 240 111TH AVE SE |
| EL189 | 236 111TH AVE SE |
| EL190 | 226 111TH AVE SE |
| EL191 | 220 111TH AVE SE |
| EL192 | 212 111TH AVE SE |
| EL194 | 204 111TH AVE SE |
| EL195 | 200 111TH AVE SE |
| EL196 | 112 111TH AVE SE |
| EL206 | 11102 SE 1TH PL |

**Figure 6-1: Recommended Sound Walls for Parcels EL100a-EL100i and EL101a-EL101h**

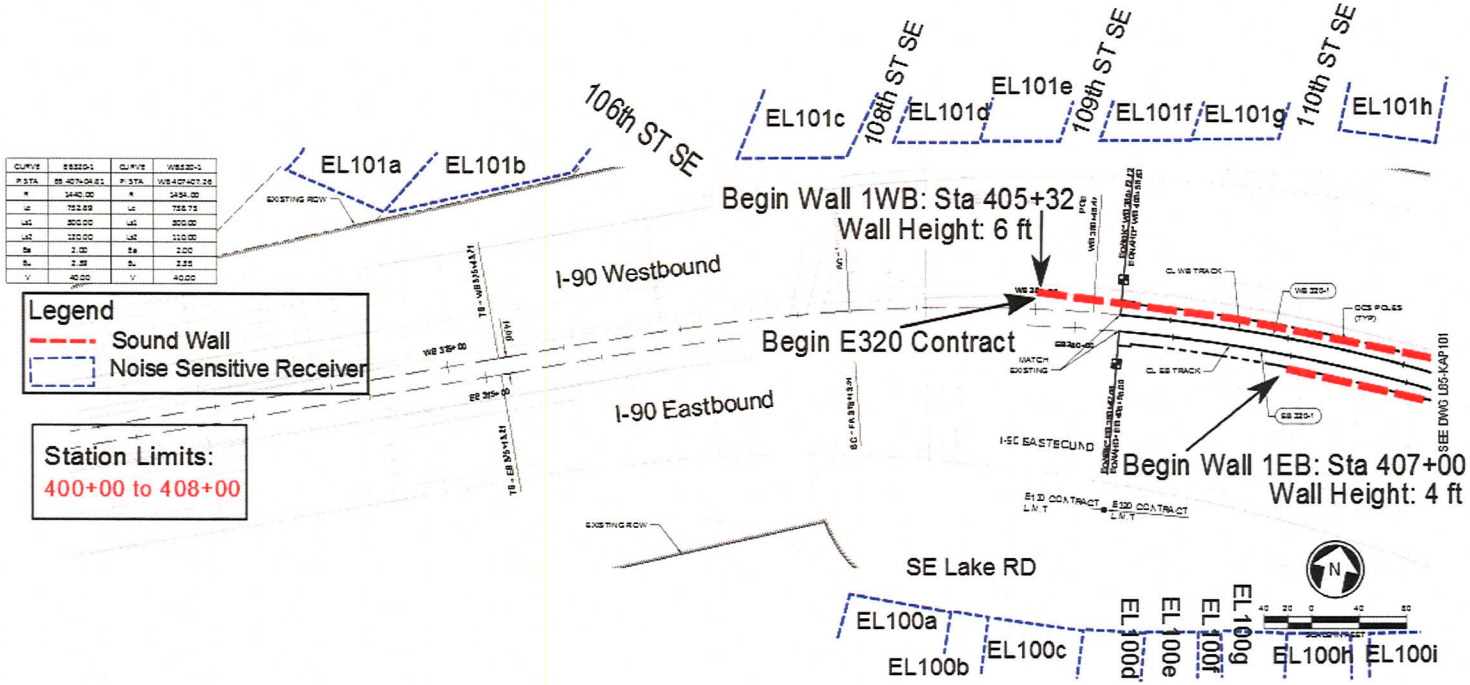


**Figure 6-2: Recommended Sound Walls for Parcels EL100h-EL100p, EL101g-EL101o**

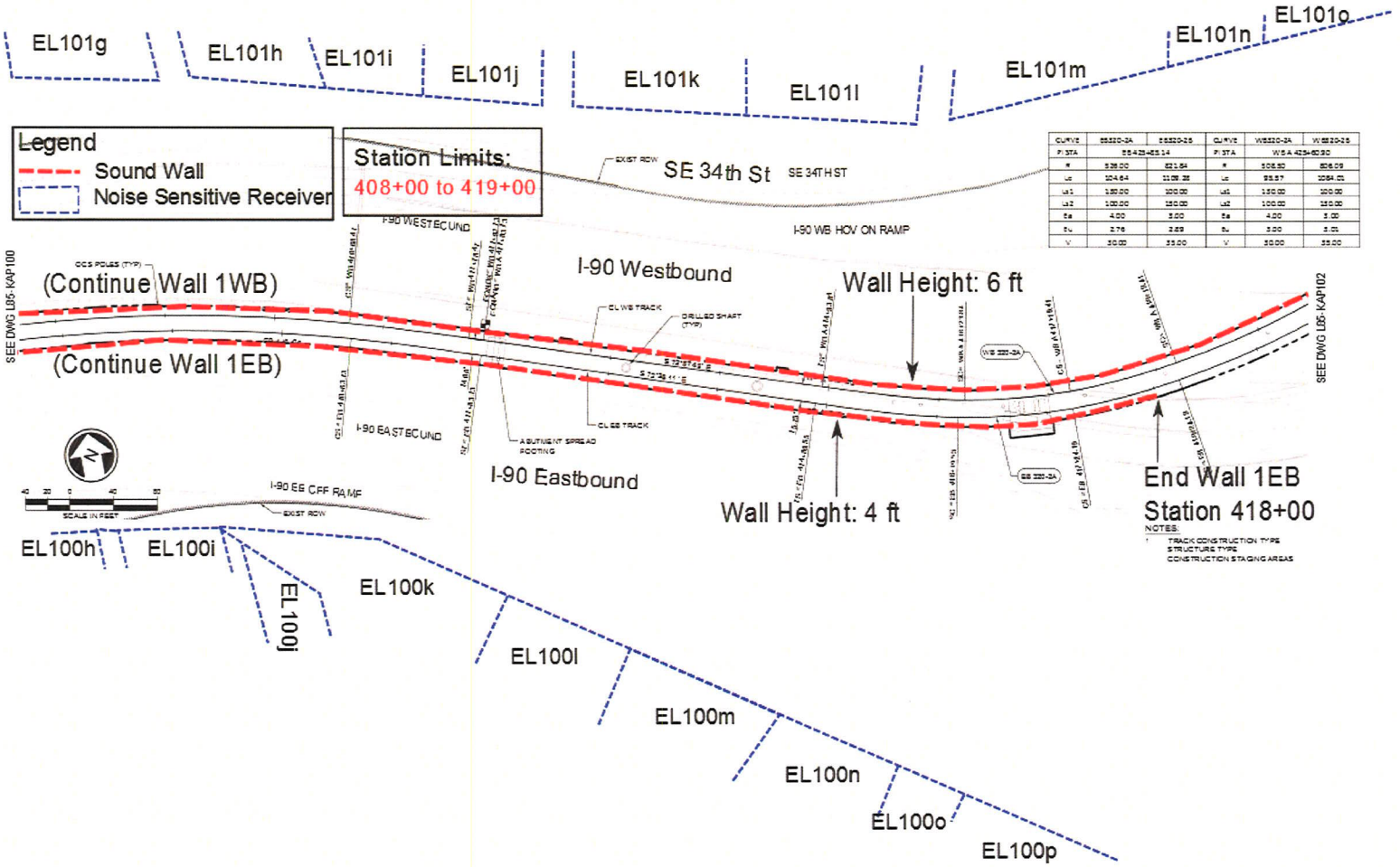


**Figure 6-3: Recommended Sound Walls for Parcels EL101p-EL101s**

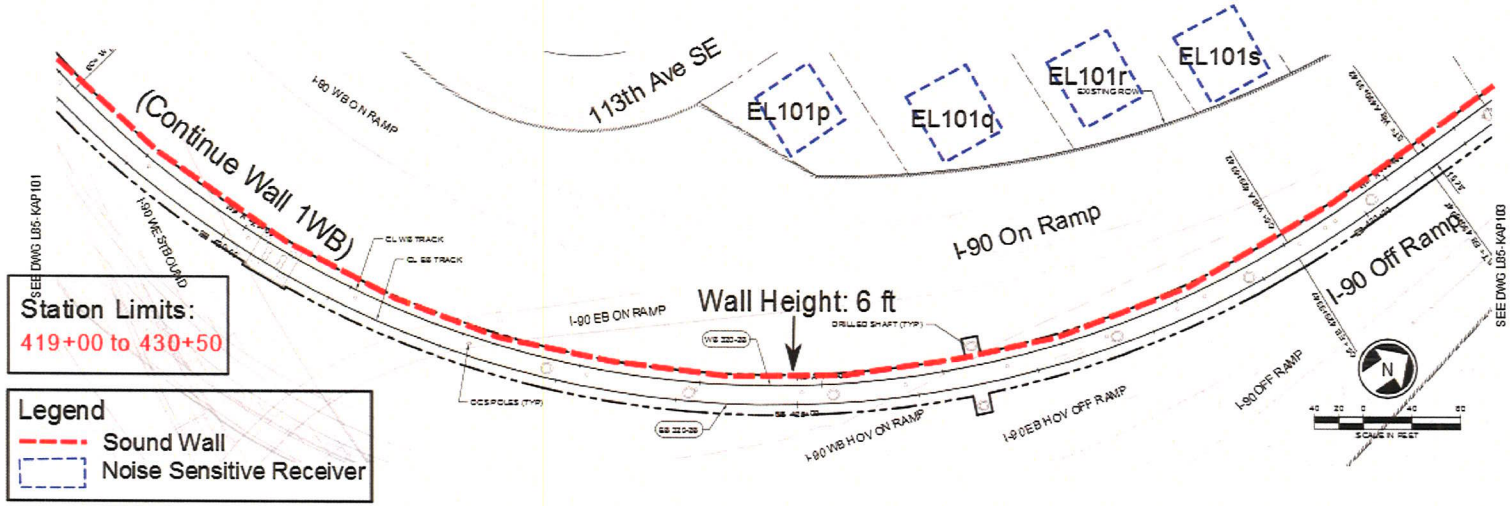


**Figure 6-4: Recommended Sound Walls for Parcels EL101t-EL103**

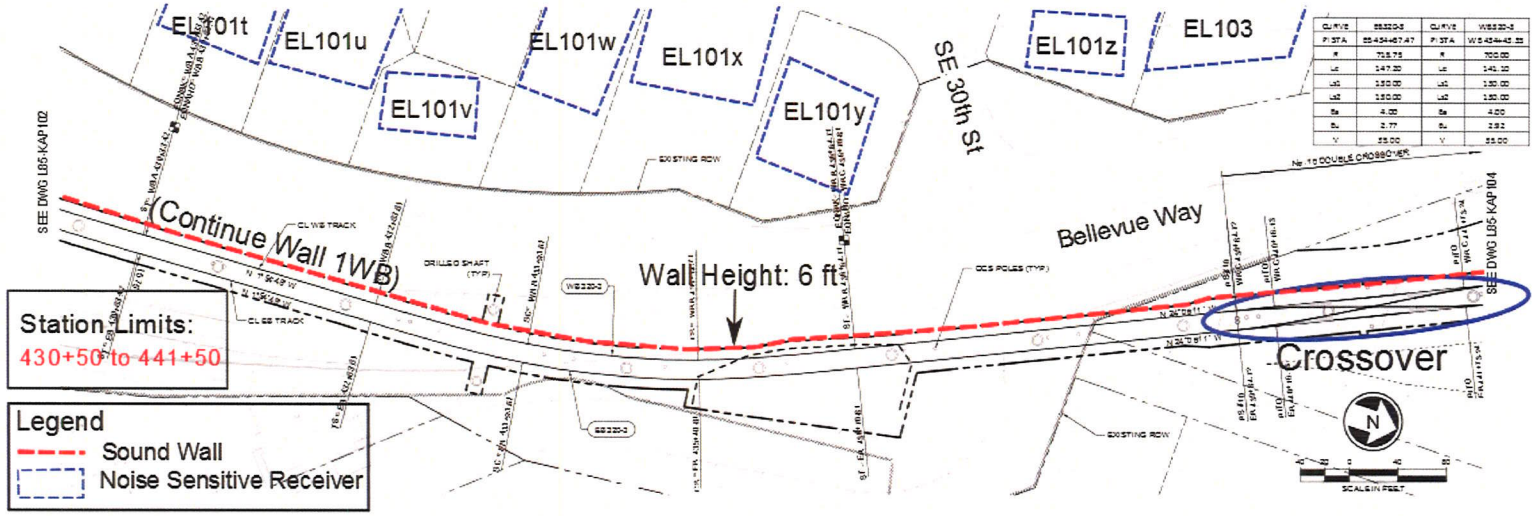


**Figure 6-5: Recommended Sound Walls for EL104-EL114**

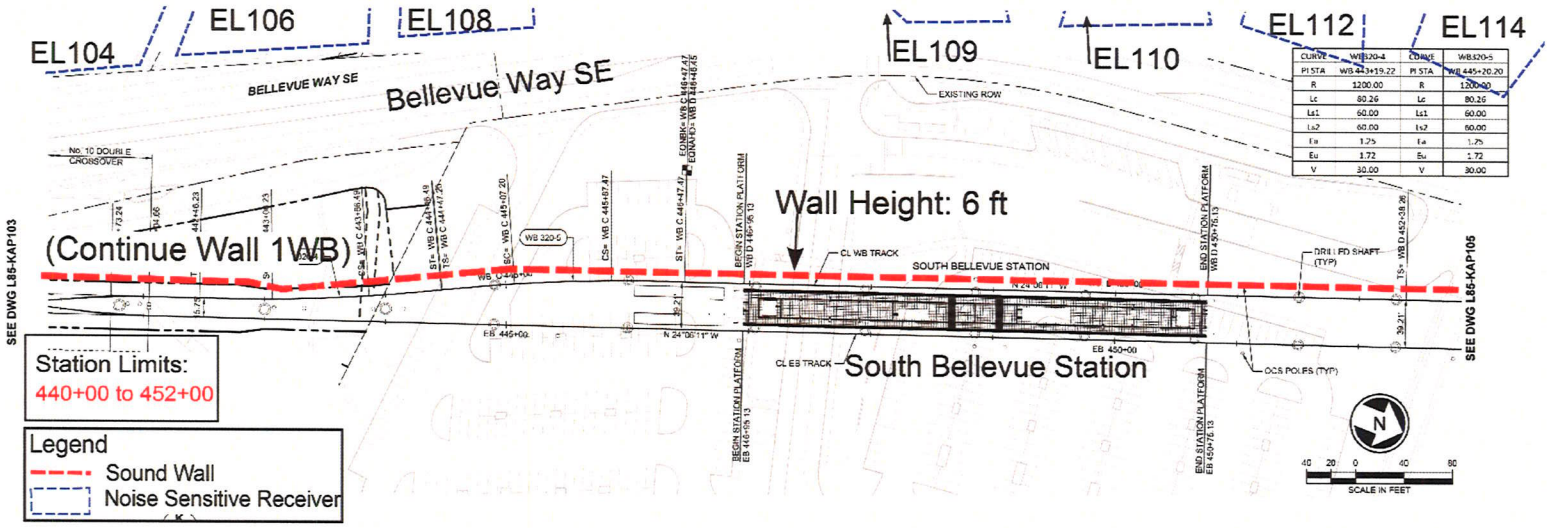


**Figure 6-6: Recommended Sound Walls for Parcels EL115-EL132**

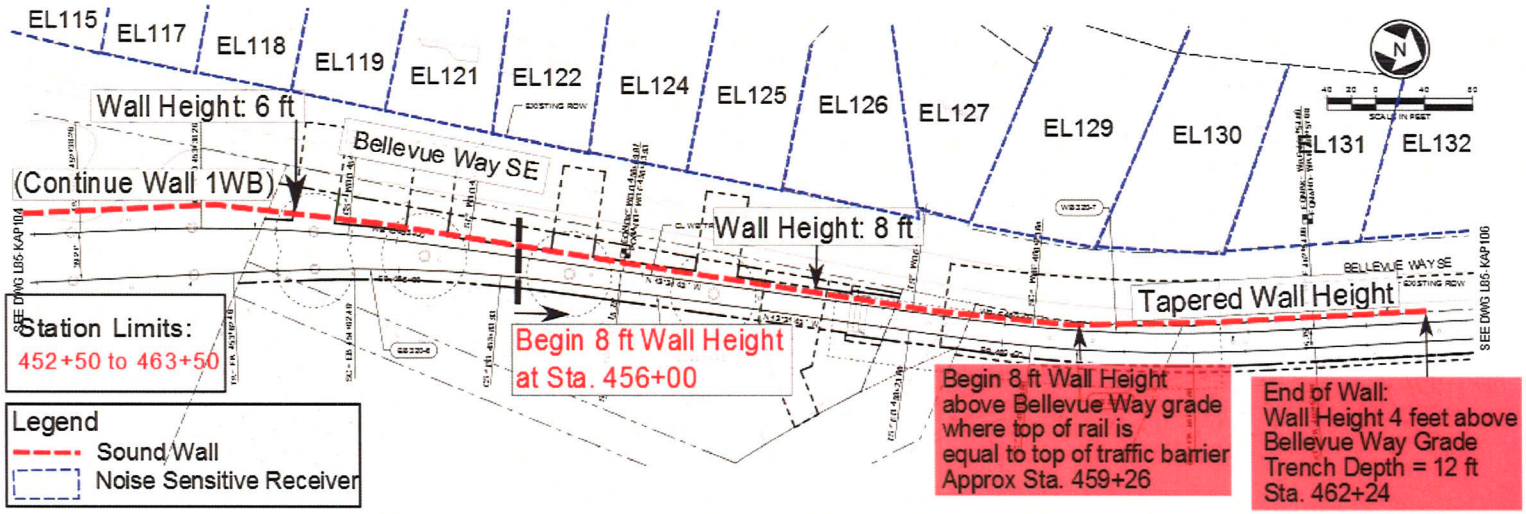


**Figure 6-7: Recommended Sound Walls for Parcels EL132-EL144**

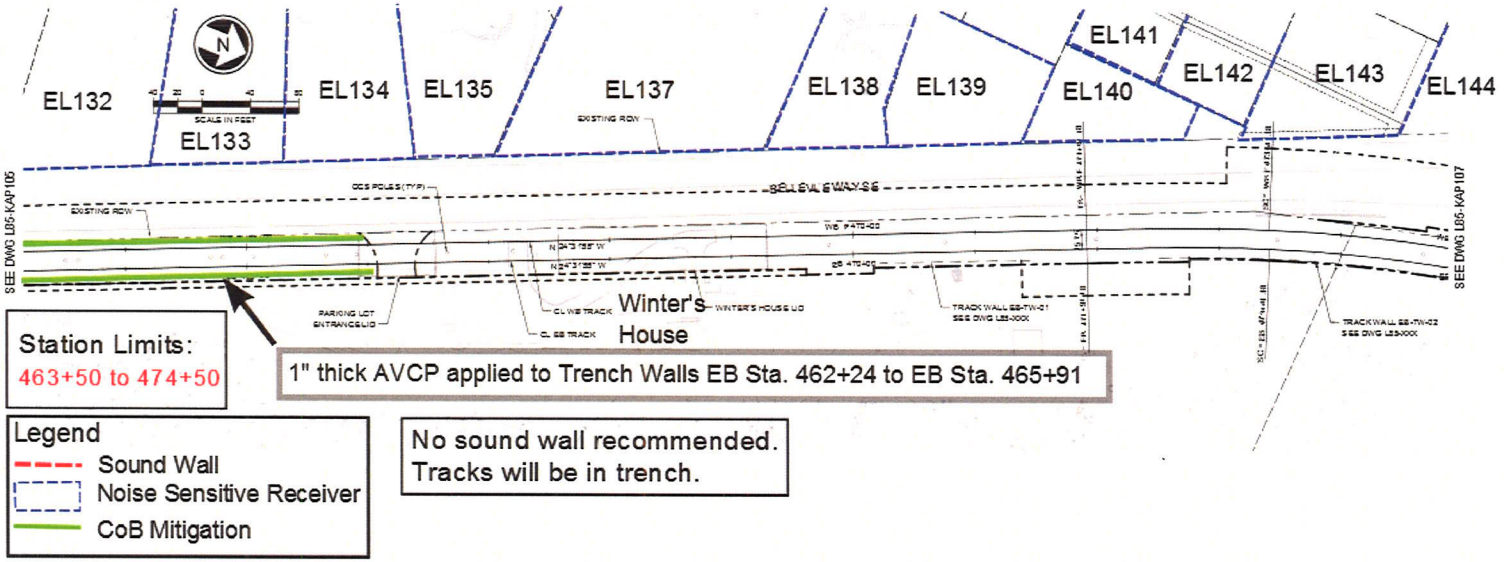


**Figure 6-8: Recommended Sound Walls for Parcels EL144-EL149e**

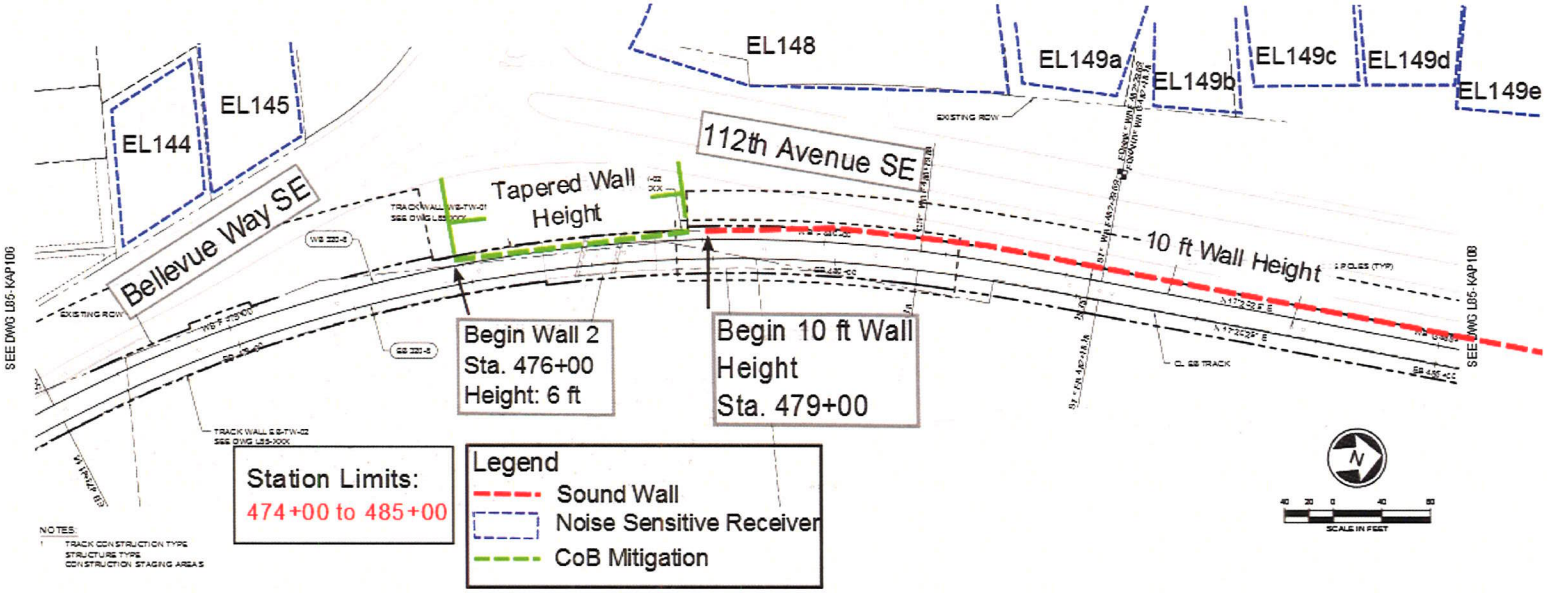


**Figure 6-9: Recommended Sound Walls for Parcels EL149f-EL151d**

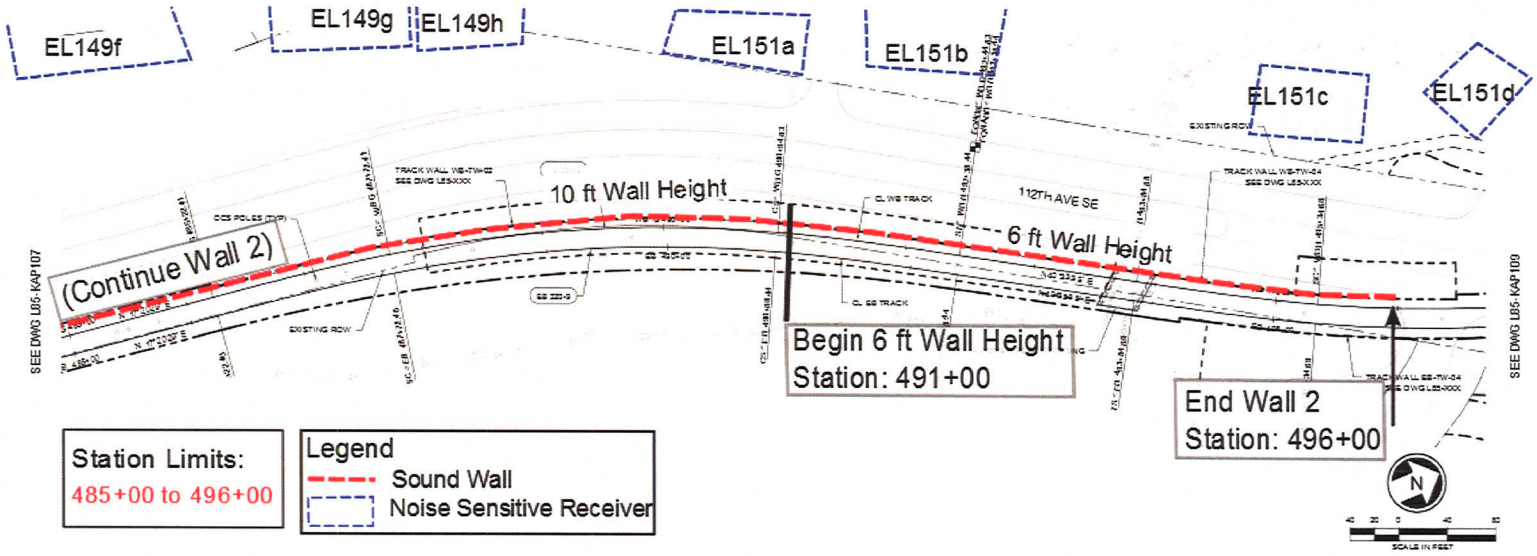


**Figure 6-10: Recommended Sound Walls for Parcels EL151e-EL163**

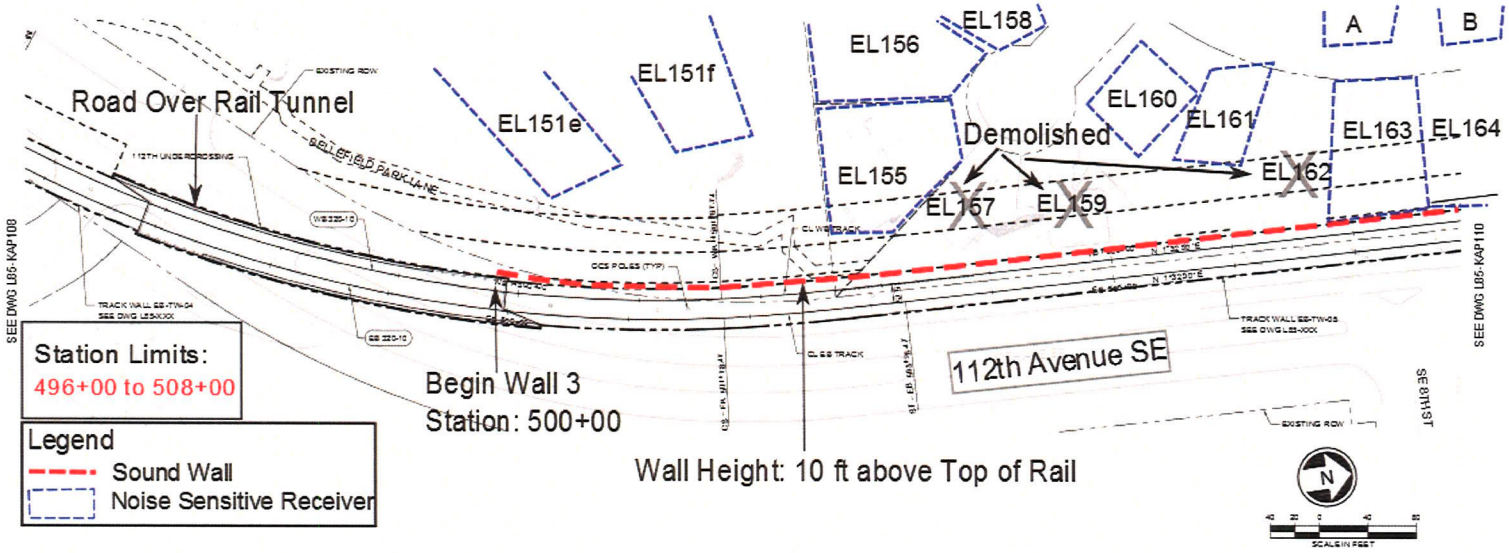


**Figure 6-11: Recommended Sound Walls for Parcels EL164-EL169**

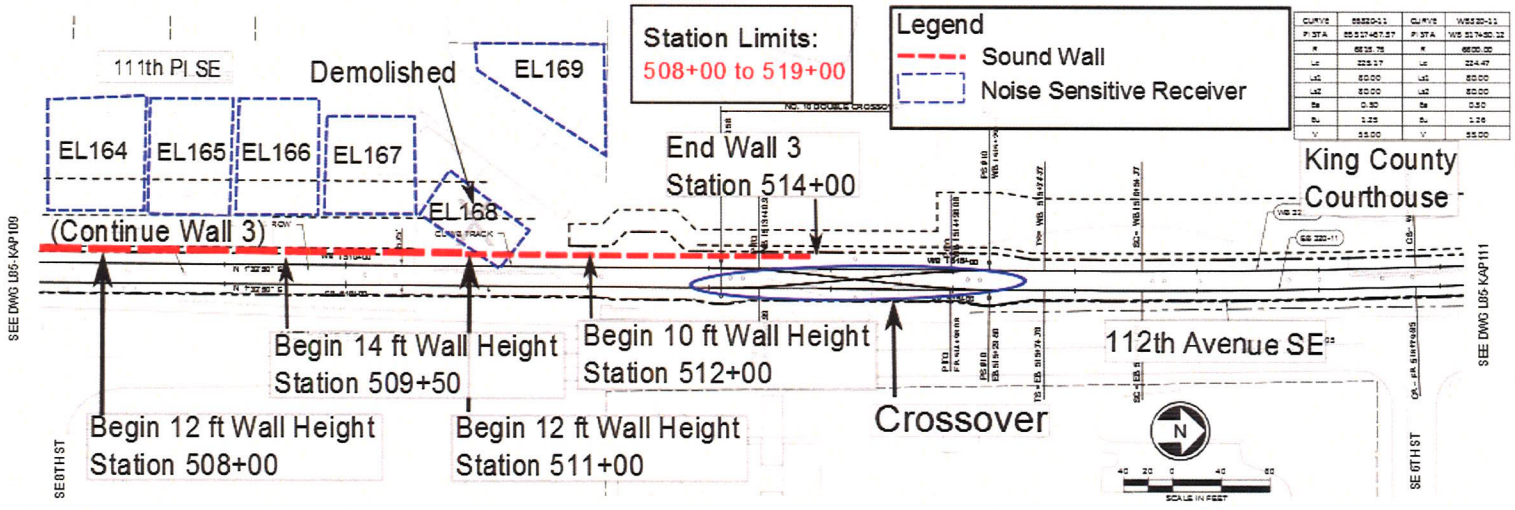


**Figure 6-12: Recommended Sound Walls for Parcels EL174-EL189**