

East Link Extension

Cost Savings Work Plan Findings

(Within City of Bellevue)

Advancement of Options

September 27, 2012

Prepared for:



Prepared by:



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Appendices

Appendix A – Cost Savings Ideas Advanced For Further Engineering Review

Appendix B - Sound Transit and City of Bellevue Cost Savings Work Plan - Motion M2012-41 (June 28, 2012)

Acronyms and Abbreviations

City	City of Bellevue
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
LRT	Light Rail Transit
LRV	Light Rail Vehicle
MOU	Memorandum of Understanding
NEPA	National Environmental Policy Act
PE	Preliminary Engineering
Project	East Link Light Rail
ROM	Rough Order of Magnitude
SEPA	State Environmental Policy Act
ST	Sound Transit
WSDOT	Washington Department of Transportation

1.0 Cost Savings Work Plan - Introduction

The East Link Extension is Sound Transit's voter-approved project to build approximately 14 miles of light rail that will extend Sound Transit's current Light Rail Transit (LRT) system from Seattle, across Lake Washington via I-90, serving Mercer Island, Bellevue and Redmond's Overlake area. The East Link Extension will connect the Eastside's biggest population and employment centers, serving 50,000 daily riders by 2030. After a five-year environmental review process, Sound Transit published the Final Environmental Impact Statement (EIS) for the East Link Extension in July 2011. Subsequently, the Sound Transit Board selected the project to be built, which included a tunnel in downtown Bellevue. In November 2011, FTA and FHWA issued their respective Records of Decision that allowed the project to move forward into final design.

On November 15, 2011, the City of Bellevue (City) and Sound Transit (ST) executed a Memorandum of Understanding (MOU) for funding and construction of the downtown Bellevue tunnel and directed staff to review City of Bellevue recommended modifications to the 112th Avenue SE corridor. The MOU establishes a collaborative framework for Sound Transit and the City to share the additional cost of a tunnel in downtown Bellevue. The MOU also establishes the City's funding commitment of \$160 million (2010 \$) for the tunnel with an initial contribution of \$100 million and a City contingent contribution of \$60 million. The MOU specifies that Project cost reductions from value engineering, design advancement, scope modifications and for any other reason within the City of Bellevue shall count towards the reduction of City contingent contribution (provided that such reductions do not result in deferral of stations or Park-and-Rides or deferral or complete elimination of other Project elements that have a direct negative Project impact on ridership or operations and maintenance).

It is within this framework that over the course of the last nine months, the City of Bellevue and Sound Transit analyzed cost savings concepts and value engineering ideas that have the potential to result in material Project cost savings of at least \$60 million, while supporting the light rail system's performance with respect to stated Project and City objectives. Sound Transit and the City co-hosted two public open houses - one on April 26, 2012 and another on June 5, 2012 to provide an opportunity for public review and comment. Sound Transit and City staff also provided numerous stakeholder briefings throughout April, May and June. Through the public involvement process, over 350 comments were received. As a result of public involvement, an additional cost savings concept was developed for 112th Avenue SE.

A Cost Savings Report was issued on June 5, 2012, by Sound Transit and the City of Bellevue that documented the work effort and findings on the cost savings concepts and value engineering ideas that have the potential to realize at least \$60 million in savings on the East Link Extension within the City of Bellevue. The entire Cost Savings Report can be found at www.soundtransit.org/eastlink. Appendix A to this report lists the Cost Savings Ideas Advanced for Further Engineering.

Following the consideration of the Cost Savings Report and public comments, Sound Transit and the City of Bellevue, developed a *Cost Savings Work Plan* to advance Cost Savings Ideas that May Affect the MOU Project Description. On June 28, 2012, the Sound Transit Board endorsed the *Cost Savings Work Plan* for the East Link Extension (See Appendix B).

Through the Collaborative Design Process, Sound Transit and City staff worked to develop these Cost Savings Ideas and to analyze different configuration options. Cost Savings Ideas that were included in the *Cost Savings Work Plan* and their configuration options are shown in Table 1-1:

**Table 1-1
Cost Savings Ideas – Advanced for Further Development**

Description
1. Bellevue Way Alignment at Winters House
1a. Shift Bellevue Way West to allow space for at-grade light rail in front of Winters House and a proposed City of Bellevue HOV Lane. The City of Bellevue HOV Lane continues the HOV lane north from the main entrance of the South Bellevue Station to the Bellevue Way and 112 th Ave “Y” intersection.
2. 112th Ave. SE Alignment
2b. Raise 112 th Ave Roadway over an at-grade alignment of light rail at SE 15 th . Options include: <ul style="list-style-type: none"> • 2.b.1- SE 4th Closed except for emergency access. This option includes a design alternative to connect Bellefield Residential Park to Surrey Downs. • 2.b.2 - General Traffic Access with SE 4th over at-grade light rail. • 2.b.3 – LRT in a trench under SE 4th (This is the same configuration in the MOU Recommendation for the north end of 112th Ave. SE)
3. Downtown Station Design
3e. Optimize the Adopted Project
3b. Construct A Stacked Tunnel Configuration (Allows tunnel to be narrower).
3c. Relocate Station to NE 6 th

1.1 Next Steps

Sound Transit and the City of Bellevue will conduct public outreach to gather comments and public opinion on the five Cost Savings Ideas in this report, from mid-September to mid-October 2012. The Sound Transit Board and City Council will be asked in October to endorse moving forward for further feasibility analysis only those cost savings ideas that the agencies believe could be incorporated into East Link Extension and support the agencies’ commitment to deliver a high-quality, well-integrated project that serves the region. Moving projects forward for further analysis is not a final decision, and in no way alters the East Link Extension project as approved by the Sound Transit Board and reflected in the Record of Decision issued by the Federal Transit Administration and the Federal Highway Administration. Instead it is an indication that the ideas have sufficient merit to continue to spend resources to review. The next phase of review, including additional engineering design and impact and mitigation analysis consistent with requirements under NEPA and SEPA, will occur in late 2012 and into 2013. A decision to incorporate any one or more of these Cost Savings Ideas into East Link Extension would not occur until this additional review is complete in 2013.

2.0 Cost Savings Work Plan- Advancement of Options

The following map, Figure 2.0.0, identifies the locations of the Cost Savings Ideas advanced for further development and described in this report:

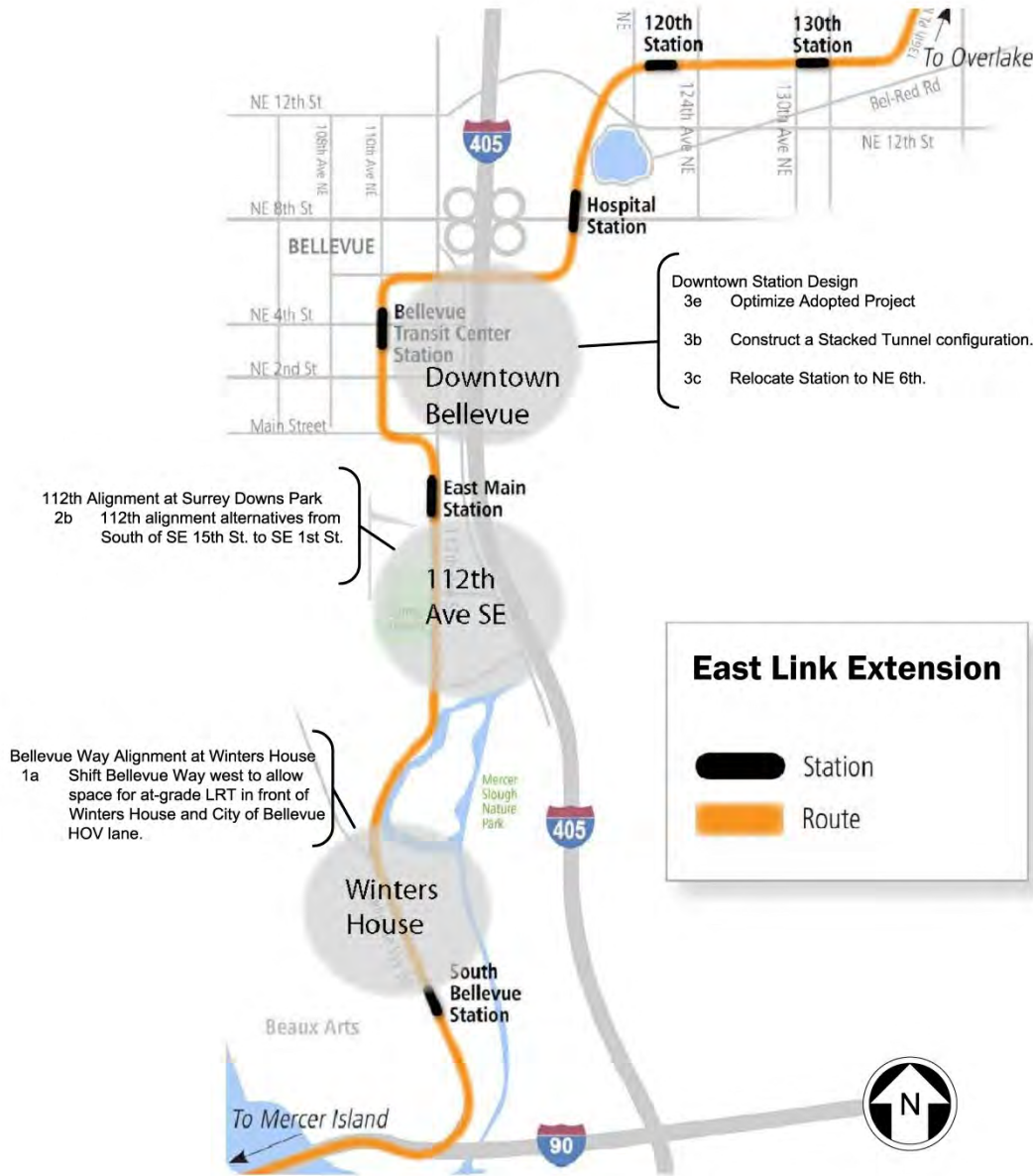


Figure 2.0.0:
Cost Savings Ideas – Advancement of Options

2.1 Cost Savings Ideas – Work Plan to Further Develop and Refine Options

Engineering Design Advancement

The purpose of this effort was to advance the conceptual level design and determine the change in costs for each of the five concepts in comparison to the MOU alignment. Advancement of design focused on identification of potential impacts, constraints, opportunities and cost impacts associated with each individual concept with the purpose of resolving uncertainties. General elements assessed included:

- Alignment changes – to both LRT and Roadway
- LRT Operations
- Structural and bridge considerations
- Station and tunnel configuration (tunnel concepts)
- Pedestrian and vehicle access
- Right-of-way impacts; including City Hall Garage (tunnel concepts)
- Utility considerations
- Fire/Life Safety and Ventilation requirements
- Cost Changes

Preliminary Environmental Information

The preliminary environmental information prepared for this report is based on both a qualitative and quantitative review of the conceptual designs for the Cost Savings Ideas. This report presents early findings of potential noise and vibration impacts consistent with FTA and FHWA Noise and Vibration criteria and associated mitigation measures. Also, potential impacts to properties, parklands, historic resources and wetlands are presented. The potential impacts to visual resources are captured in a series of illustrations. Similar to the June 2012 Cost Savings Report, transportation metrics of light rail access and ridership, traffic impacts, vehicle and pedestrian access are presented.

This preliminary environmental information is intended to help the Sound Transit Board and Bellevue City Council to further narrow the Cost Savings Ideas. The Cost Savings Ideas that are advanced further will undergo a formal environmental review consistent with NEPA and SEPA requirements to support a decision on whether to modify the East Link Extension.

Cost Refinement

The Cost Savings Ideas presented in this report are conceptual. Consequently, there is still uncertainty regarding the estimated cost savings. Therefore, for ideas that affect the MOU or Adopted project, an accuracy range of minus 30 percent (-30%) to plus 20 percent (+20%) was applied to the estimated cost savings (MOU/Adopted Project Estimate minus Cost Savings Idea Estimate) to determine the cost savings range. This approach is consistent with construction industry practices and standards, such as *ASTM E2516 – 11 – Standard Classification for Cost Estimate Classification System* and it takes into consideration the conceptual nature of the Cost Savings Ideas.

In addition, the cost estimate methodology for this *Cost Savings Work Plan* utilized the full detailed preliminary engineering cost estimate developed for the East Link Extension to compare the cost savings between the adopted/MOU project and the Cost Savings Idea. Also, more definitive quantity take offs

(i.e., reduction of structural steel by 300 tons, instead of “approximately 30% reduction in structural steel”) have been included.

All estimated costs are in 2010 dollars.

3.0 Cost Savings Ideas Advanced for Further Development

This section of the report provides detailed information regarding the five Cost Savings Ideas advanced for further development including more engineering definition, preliminary environmental information, and a cost refinement of each idea.

In summary, the range of cost savings expected to be realized from each of the Cost Savings Ideas advanced for further development is summarized in Table 3-1 as follows:

**Table 3-1
Cost Savings Ideas - Design Options**

Description	Range of Savings (2010 \$ M)
1. Bellevue Way Alignment at Winters House	
<p>1a. Shift Bellevue Way West to allow space for at-grade light rail in front of Winters House and a proposed City of Bellevue HOV Lane. The City of Bellevue HOV Lane continues the HOV lane north from the main entrance of the South Bellevue Station to the Bellevue Way and 112th Ave “Y” intersection.</p> <p>This Cost Savings Range is based upon a City of Bellevue contribution of \$ 11 million for the City of Bellevue HOV Lane. The City’s estimate for building the HOV lane separately is approximately \$ 18 million.</p>	\$ 7 to \$ 11
2. 112th Ave. SE Alignment	
<p>2b. Raise 112th Ave Roadway over an at-grade alignment of light rail at SE 15th. Options include:</p> <ul style="list-style-type: none"> • 2.b.1 - SE 4th Closed Except for Emergency Access. This option may include a design alternative to connect Bellefield Rd to Surrey Downs (*See Note below for cost impact) • 2.b.2 - General Traffic Access with SE 4th over at-grade light rail. • 2.b.3 – LRT in Trench under SE 4th (This is the same configuration in the MOU Project for the North End of 112th Ave. SE) 	<p style="text-align: center; vertical-align: middle;">\$ 9 to \$ 16</p> <p style="text-align: center; vertical-align: middle;">\$ 7 to \$ 12</p> <p style="text-align: center; vertical-align: middle;">Same Approximate Cost as MOU Project</p>
3. Downtown Station Design	
<ul style="list-style-type: none"> • 3e. Optimize the Adopted Project • 3b. Construct a stacked tunnel configuration (Allows tunnel to be narrower) • 3c. Relocate Station to NE 6th 	<p style="text-align: center; vertical-align: middle;">\$ 6 to \$ 10</p> <p style="text-align: center; vertical-align: middle;">\$ 8 to \$ 13</p> <p style="text-align: center; vertical-align: middle;">\$ 23 to \$ 39</p>

* Note: If the Bellefield Rd to Surrey Downs Option is included, then the Cost Savings Range is \$ 7 to \$ 13 million.

Additional information for each of the five Cost Savings Ideas is provided in Sections 3.1 through 3.3 of this report. The information on the Downtown Station Design Options is grouped together for comparison purposes. Included for each Cost Savings Idea are:

- A Cost Savings Evaluation Worksheet – containing a narrative description, cost analysis and preliminary environmental information; and
- An overall map showing the location of the Cost Savings Idea within the East Link Extension alignment;
- A series of graphics including plan views and cross sections as well as visual simulations depicting the Cost Savings Idea.

3.1 Bellevue Way Alignment at Winters House

3.1.1 Cost Savings Idea 1a - Shift Bellevue Way West to Allow Space for At-Grade LRT in Front of Winters House and a Proposed City of Bellevue HOV Lane

**Table 3-2
Cost Savings Evaluation: Shift Bellevue Way West – Cost Savings Idea - 1a**

Cost Savings Evaluation Worksheet	
Description: Shift Bellevue Way West to Allow Space for At-Grade LRT in Front of Winters House with Proposed City of Bellevue HOV Lane	Proposal: 1a
<p>MOU Project: The Adopted Project for the Bellevue Way alignment includes an aerial structure coming out of the I-90 corridor on the east side of Bellevue Way, continuing on aerial structure through the South Bellevue Way Park-and-Ride with an aerial station platform. The alignment continues north also on aerial structure and then transitions to a trench in front of Winters House, gradually climbing out of the trench as the alignment heads north to the “Y” intersection of 112th Ave. SE and Bellevue Way.</p>	
<p>Cost Savings Idea: Shift Bellevue Way West to Allow Space for At-Grade LRT in Front of Winters House with Proposed City of Bellevue HOV Lane - This Cost Savings Idea moves Bellevue Way to the west so the LRT can be constructed at-grade at the existing east curb line along the Winters House and continues the City of Bellevue proposed HOV lane north from the main entrance of the South Bellevue Station to the Bellevue Way and 112th Ave “Y” intersection. This modified layout eliminates two major elements from the adopted project – the lidded trench at the Winters House and the open trench south and north of this area. Cost savings come from eliminating the trench and replacing it with at-grade track in this section, although there are additional costs associated with moving the roadway west, additional property impacts and additional infrastructure associated with the HOV lane. Access to the Winters House and Blueberry Farm is maintained and vehicle and pedestrian access is provided via low speed driveway/multi-use path. In addition, this idea includes:</p> <ul style="list-style-type: none"> • A City of Bellevue southbound HOV lane that would increase southbound traffic capacity. It requires more property acquisition and increases the height of the retaining wall structures to the west. 	
<p>Why Consider this Configuration:</p> <ul style="list-style-type: none"> • As compared with the Cost Savings Idea shown in the June <i>Cost Savings Report</i>, the access to the Winters House and Blueberry Farm has been moved south and the LRT alignment lowered to minimize the visual impact of the aerial structure. • Provides additional separation between LRT and the Winters House. LRT is planned in the present location of the northbound traffic lanes of Bellevue Way and off the Winters House property. • Better profile for LRT operations (fewer vertical changes). • City’s proposed HOV Lane is included with LRT, which enables both projects to be built at a lower cost than if both projects were built separately. • A multi-use path is proposed east of Bellevue Way from the South Bellevue Station to 112th Ave. SE. in lieu of a sidewalk. 	
<p>Design Considerations Addressed (From Sound Transit and City of Bellevue Cost Savings Work Plan - Motion M2012 -41 dated June 28, 2012):</p> <ul style="list-style-type: none"> • <u>Noise and visual mitigation for increased length of above grade guideway</u> – Preliminary noise and visual impacts are discussed in this report and will be addressed in the upcoming environmental review if this cost savings idea is endorsed for further feasibility analysis. Preliminary noise mitigation is described below. In addition, landscaping types that may contribute to screening have been identified for areas where sufficient space exists. LRT alignment lowered to minimize the visual impact of the aerial structure. 	

Shift Bellevue Way West to Allow Space for At-Grade LRT in Front of Winters House with Proposed City of Bellevue HOV Lane		Proposal: 1a
<ul style="list-style-type: none"> • <u>Reduce the added length of elevated guideway from the previous cost savings idea</u> - As compared with the Move Bellevue Way West option included in the June Cost Savings Report, the portion of the guideway that will appear elevated has been reduced by approximately 600 feet in length. • <u>Optimize the access location for the Blueberry Farm and Winters House</u> - The access location for the Blueberry Farm and Winters House has been located south of the Blueberry Farm. This has allowed the elevated guideway to come down to at-grade sooner than the alignment shown in the June Cost Savings Report. • <u>If alternative 1a advances, it should include a HOV lane</u>– The Move Bellevue Way West Option 1a now includes the City’s Bellevue Way HOV lane project. 		
		Range of Savings (2010 \$ M)
Cost Analysis	\$ 7 to \$ 11	
	This Cost Savings Range is based upon a City of Bellevue contribution of \$ 11 million for the City of Bellevue HOV Lane. The City’s estimate for building the HOV lane separately is approximately \$ 18 million.	
Resource	MOU Project LRT in Trench in front Of Winters House	Proposal 1a: Light Rail at-grade, shift Bellevue Way West with HOV Lane
LRT Operations	Vertical alignment geometry near maximum allowable design criteria.	Improves LRT operations due to fewer vertical changes in the alignment thereby increasing rider comfort.
LRT Access and Ridership	N/A	N/A
Traffic Impacts	HOV Lane from main entrance of South Bellevue Station/park-and-ride to I-90.	City of Bellevue proposed HOV lane added, north from the main entrance of the South Bellevue park-and-ride to the Bellevue Way and 112 th Ave “Y” intersection. The southbound HOV lane reduces traffic congestion along Bellevue Way SE. Intersection LOS meets City of Bellevue and WSDOT standards.
Vehicle Access	Blueberry Farm access is rerouted and combined with access to the Winters House.	Creates a new combined roadway connection between the Blueberry Farm and Winters House - south of the existing Blueberry Farm entrance. Blueberry Farm parking is modified to allow for the new combined in and out access, with the number of parking spots maintained.
Pedestrian Access	Blueberry Farm public functions combined at the Winters House with one access off Bellevue Way.	Blueberry Farm public functions remain at the existing location. Sidewalk is replaced with a multi-use path to access Blueberry Farm and Winters House.

Resource	MOU Project LRT in Trench in front Of Winters House	Proposal 1a: Light Rail at-grade, shift Bellevue Way West with HOV Lane
Approximate Noise Impacts Light Rail and Traffic	<p>Light rail noise impacts to 13 residences on west side of Bellevue Way SE south of Winters House, mitigated with sound walls and/or building sound insulation.</p> <p>The adopted project would not affect the alignment of Bellevue Way SE and therefore would not have any traffic noise impacts.</p>	<p>Light rail noise impacts to 15 residences on the west side of Bellevue Way SE. The increase is from bringing the light rail to at-grade and moving it closer to residences.</p> <p>No LRT noise impacts to the Winters House.</p> <p>Shifting Bellevue Way SE west with LRT and with the addition of a southbound HOV lane results in 20 traffic noise impacts. All of the residences impacted by traffic noise already experience noise levels from Bellevue Way in excess of the traffic noise criteria. Of these, 13 residences are affected by both traffic and light rail noise.</p> <p>The light rail and traffic noise impacts could be mitigated with, a noise wall on top of the retaining wall and building sound insulation. Sound insulation could also be considered instead of the wall.</p>
Approximate Vibration Impacts	<p>There would be potential groundborne noise impact at the Winters House due to the proximity of the proposed lidded trench to the building. There would be no vibration impact at the Winters House. Impact can be mitigated with ballast mats, resilient rail fasteners or floating slab track.</p>	<p>There would be no groundborne noise or vibration impact at the Winters House with the at-grade track alignment and the increased distance of the proposed alignment to the building.</p>
Visual Appearance	<p>Lidded trench in front of Winters House. No changes west of Bellevue Way SE.</p>	<p>Light rail more visible from at-grade profile in front of Winters House. Visual change due to loss of vegetation and a retaining wall on west side of Bellevue Way SE.</p>

Resource	MOU Project LRT in Trench in front Of Winters House	Proposal 1a: Light Rail at-grade, shift Bellevue Way West with HOV Lane
Approximate Property Impacts	<p>Full Acquisitions:1 Partial Acquisitions:4 Residential Displacements: 1</p> <p>All acquisitions and the one displacement would occur on the east side of Bellevue Way SE (caretaker’s house).</p>	<p>Full Acquisitions: 4 Partial Acquisitions: 26 Residential Displacements: 4</p> <p>For the west side of Bellevue Way SE, the realignment would require three full acquisitions and 24 partial acquisitions, resulting in three residential displacements in addition to the caretaker’s house or on the east side of Bellevue Way SE.</p>
Approximate Wetland Impacts	Wetlands in the Mercer Slough Park impacted.	Less wetlands impacted.
Approximate Parkland Impacts	<p>Light rail located within west edge of Mercer Slough Nature Park.</p> <p>Access to the Blueberry Farm retail facility is relocated near the Winters House with a combined driveway.</p>	<p>Similar impacts south of Winters House, slightly less impacts north of house.</p> <p>New combined parking access to the Blueberry Farm and Winters House - south of the existing Blueberry Farm entrance.</p> <p>This configuration keeps the retail area in its current location.</p>
Historic Properties	Lidded trench under front yard of Winters House, potential for construction damage.	Light rail located at-grade in front of Winters House but avoids the property.

3.1.2 Cost Savings Ideas 1a – Shift Bellevue Way West to Allow Space for At-Grade LRT in Front of Winters House and a Proposed City of Bellevue HOV Lane

The following map identifies the location of the Cost Savings Idea and shows the location of the following graphics/figures.

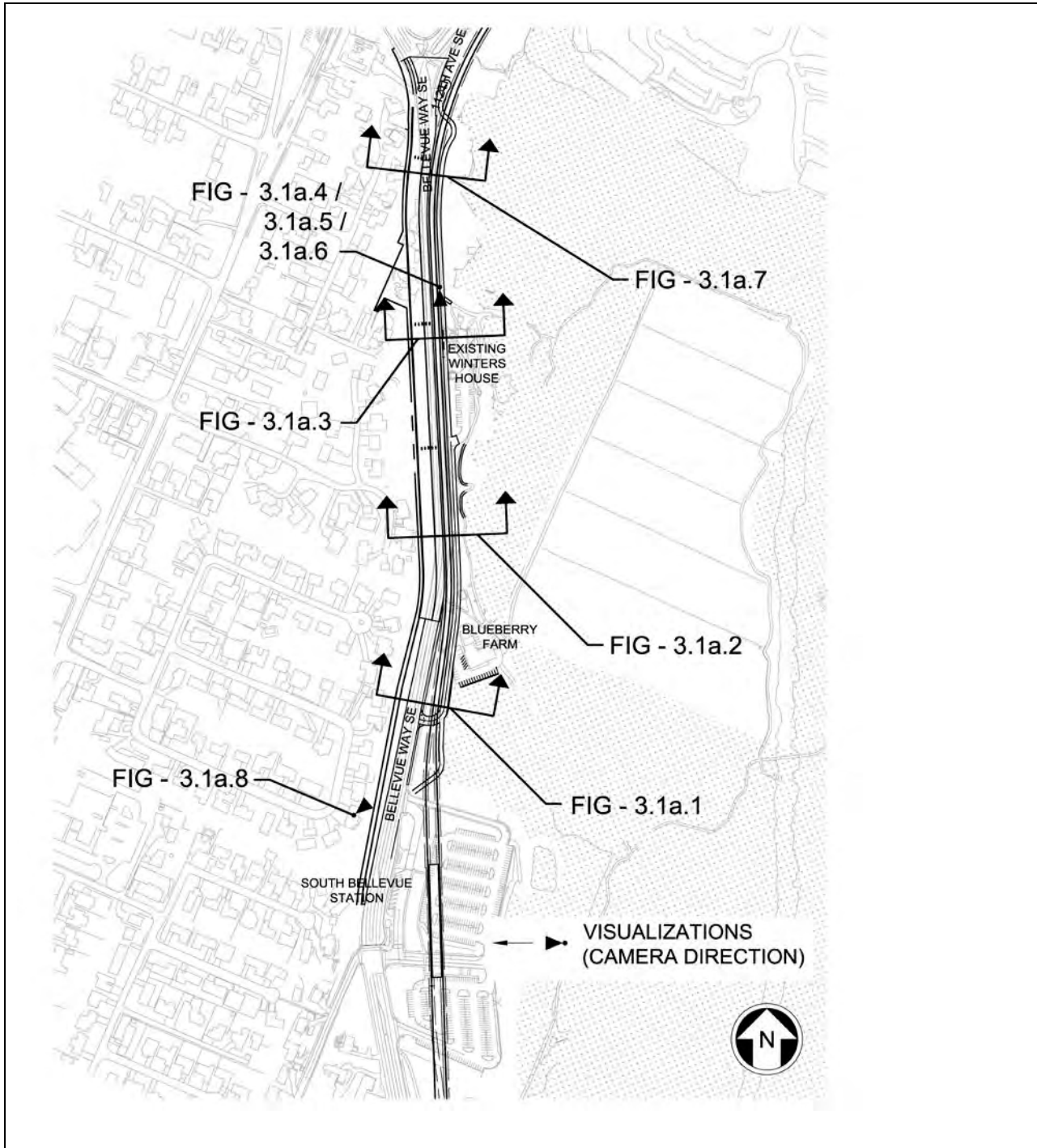


Figure 3.1a.1: Bellevue Way Alignment at Winters House - Shift Bellevue Way West with City of Bellevue HOV Lane —1a



Figure 3.1a.4: Bellevue Way Alignment at Winters House - MOU Project Looking South at Winters House



Figure 3.1a.5: Bellevue Way Alignment at Winters House - Shift Bellevue Way West with City Of Bellevue HOV Lane –Looking South at Winters House–Cost Savings Idea 1a

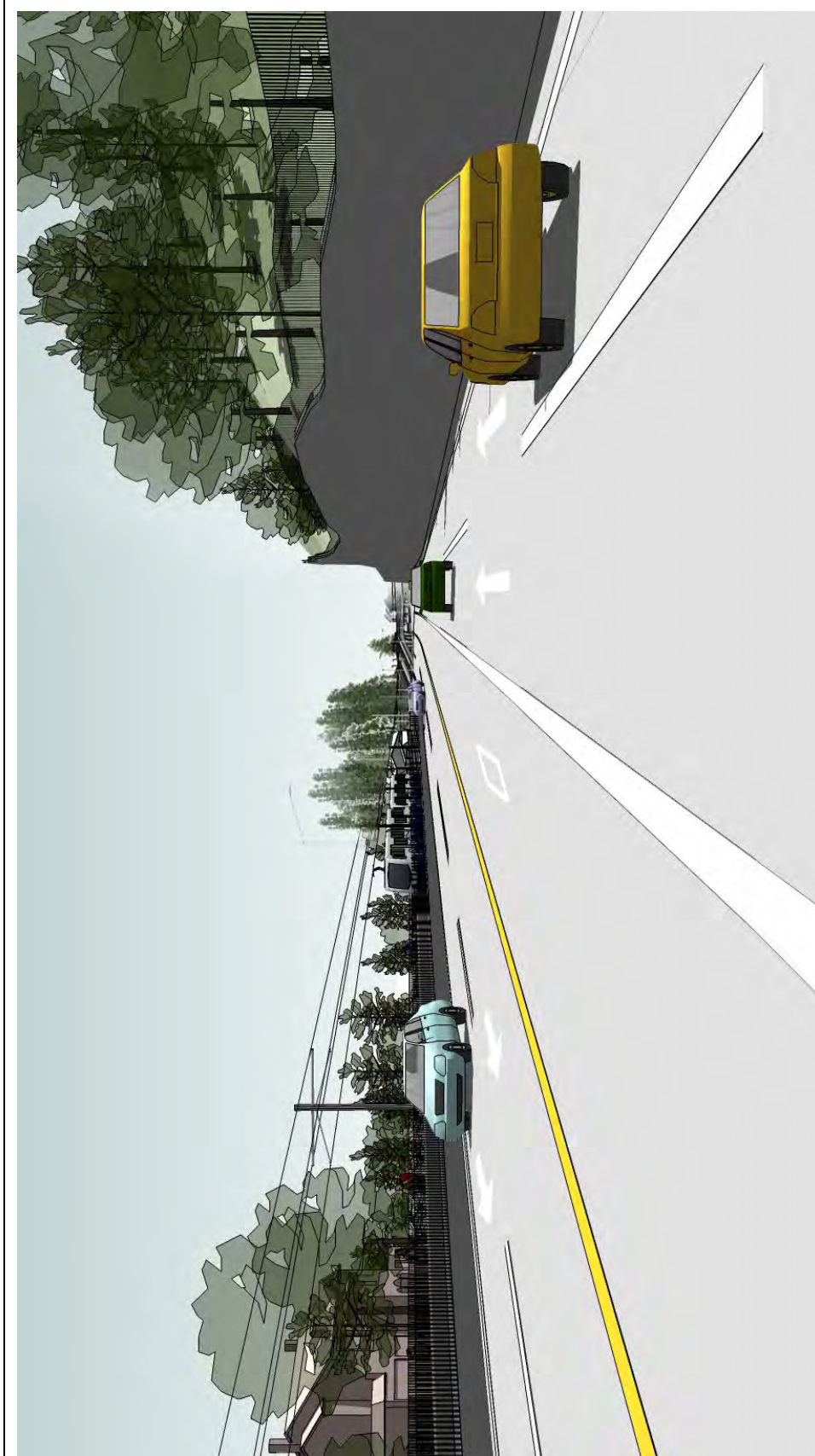


Figure 3.1a.6: Bellevue Way Alignment at Winters House - Shift Bellevue Way West with City of Bellevue HOV Lane – Looking South (Street view) at Winters House – Cost Savings Idea 1a

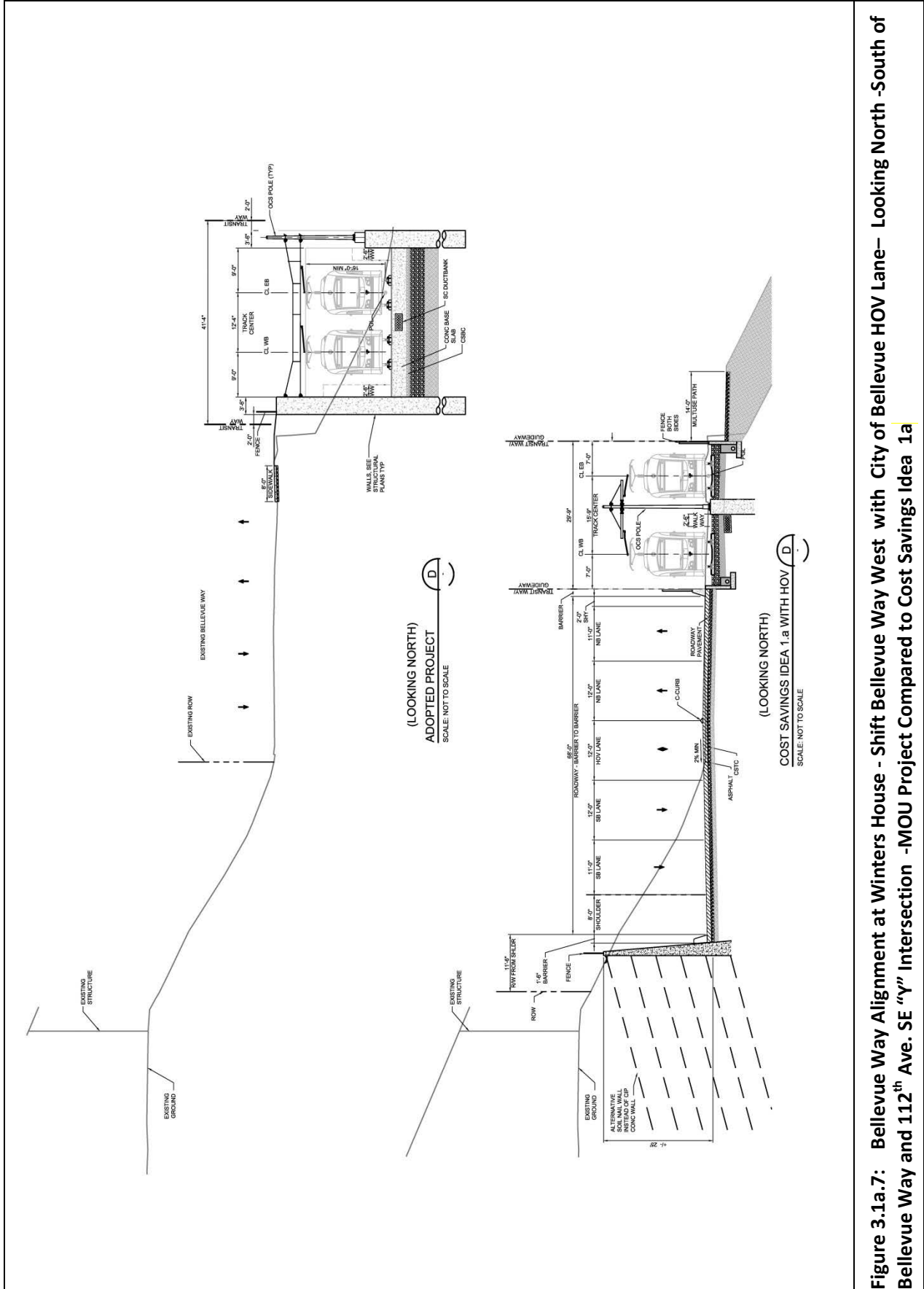


Figure 3.1a.7: Bellevue Way Alignment at Winters House - Shift Bellevue Way West with City of Bellevue HOV Lane— Looking North -South of Bellevue Way and 112th Ave. SE “Y” Intersection -MOU Project Compared to Cost Savings Idea 1a

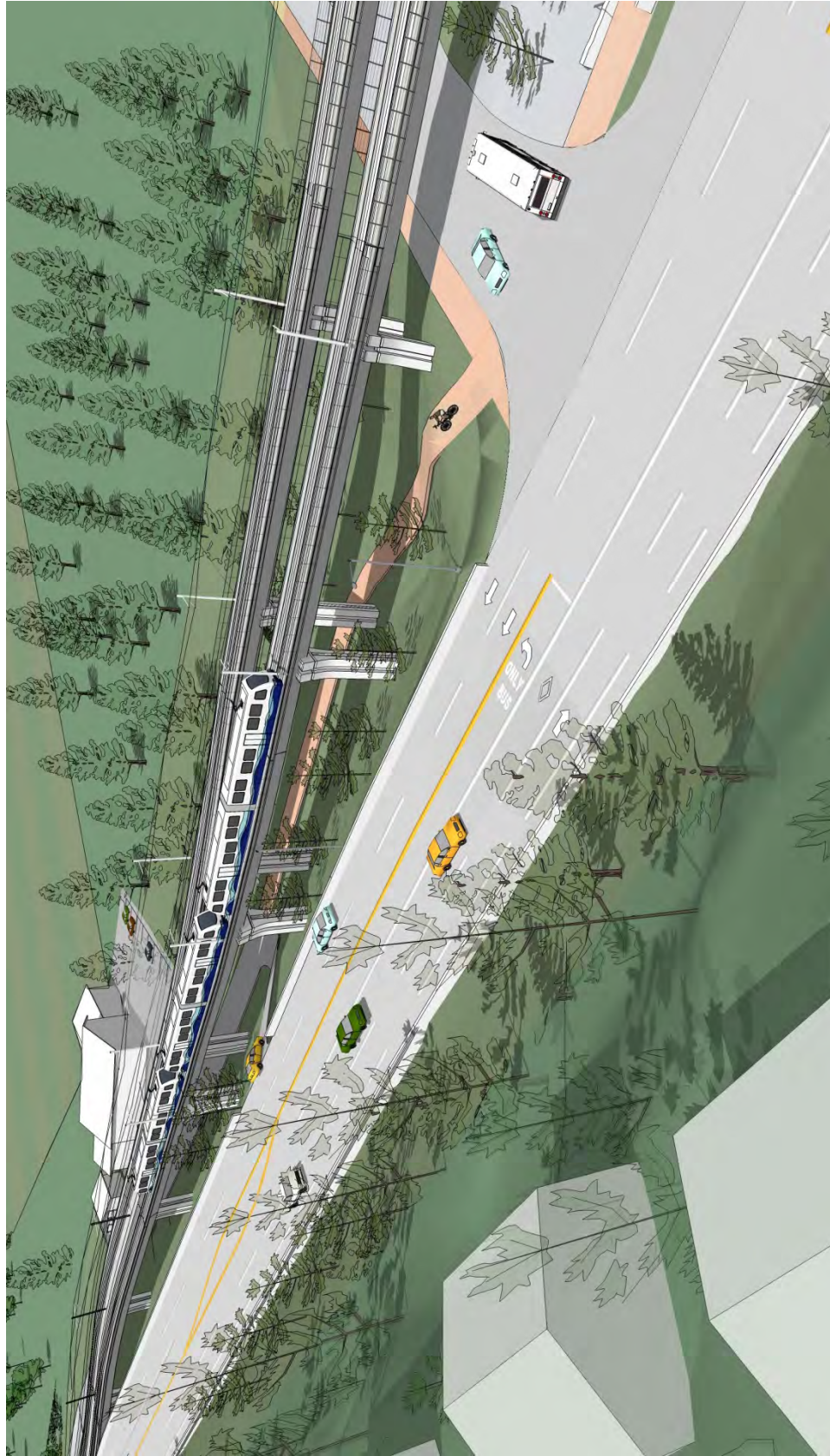


Figure 3.1a.8: Bellevue Way Alignment at Winters House - Shift Bellevue Way West with City of Bellevue HOV Lane— Looking North at Blueberry Farm Access – Cost Savings Idea 1a

3.2 112th Ave. SE Alignment

3.2.1 Cost Savings Idea 2b –Raise 112th Ave. SE Alignment over At-Grade Light Rail

**Table 3-3
Cost Savings Evaluation: 112th Alignment – Cost Savings Idea – 2b**

Cost Savings Evaluation Worksheet	
Description: 112th Ave. SE Alignment	Proposal: 2b
<p>MOU Project: With the MOU Concept, the LRT guideway configuration crosses 112th Ave. SE on an elevated guideway at approximately SE 15th St. The LRT transitions to a trench north of SE 8th Street. North of SE 8th St., the alignment continues in a trench, sufficiently deep to cross below a reconstructed SE 4th St., after which the alignment transitions close to at-grade into the East Main Station. The MOU concept closes all access between Surrey Downs Park and 112th Ave. SE and between SE 1st St. and 112th Ave. SE. This concept maintains Surrey Downs neighborhood access at SE 4th St.</p>	
<p>Cost Savings Idea: Raise 112th Ave. SE Over At-Grade Light Rail: This idea follows a similar horizontal alignment along 112th Ave. SE but raises the 112th Ave. SE roadway in the vicinity of SE 15th St. so vehicle and pedestrian traffic passes over the at-grade LRT. This concept does not change the East Main Station and adds kiss-and-rides on both the east and west sides of 112th Ave. SE. Three alternative options were developed between Surrey Downs Park and the East Main Station along 112th Ave. SE. All alternatives address different configurations to connect the Surrey Downs neighborhood with 112th Ave SE.</p>	
<p>Common to all Options:</p> <ul style="list-style-type: none"> • The LRT travels on the east side of 112th Ave SE from the intersection of 112th and Bellevue Way until SE 15th St. • The LRT crosses to the west side at-grade (the existing roadway level) below the raised 112th Ave. SE roadway in a lidded structure through a new roadway embankment. The crossing is in the vicinity of the intersection between 112th Ave. SE and SE 15th St. The connection with SE 15th St. and Bellefield Residential and Office Park is moved north from its current location and changed to right-in, right-out. • These ideas close all direct access between Surrey Downs Park and 112th Ave SE and between SE 1st St. and 112th Ave SE. All options provide access to Surrey Downs Park via SE 4th St. 	
<p>Specific to each of the Options:</p> <ul style="list-style-type: none"> • <u>Option 2.b.1 –SE 4th Closed (Except for Emergency Access) with Bellefield Residential Park to Surrey Downs Connection (design option):</u> Once on the west side of 112th Ave. SE , the LRT travels primarily at-grade to SE 4th St. There is an at-grade controlled LRT crossing at SE 4th St. to be used only for emergency vehicles. After SE 4th St., the LRT travels at-grade along 112th Ave. SE to the East Main Station (similar to 2.b.2). Unique to this idea, it includes an optional connection between Surrey Downs neighborhood from 111th Pl. SE and the Bellefield Residential Park providing access to Southbound 112th Ave. SE. • <u>Option 2.b.2 General Access at SE 4th St. -</u> Once on the west side of 112th Ave. SE, the LRT travels primarily at-grade until SE 4th St. SE 4th St. crosses elevated over the at-grade LRT to provide general traffic access to/from 112th Ave. SE. Ramps on retained embankments connect to and from southbound 112th Ave SE to SE 4th St. with right-in, right-out access. North of SE 4th St., the LRT travels primarily at-grade along 112th Ave SE to the East Main Station (same as 2.b.1). An optional “U” turn could be provided at the proximity of Main Street to provide northbound vehicles access to the neighborhood. Vehicle access at SE 4th St. is provided by right-in/right-out movement providing pedestrian access as well. 	

Description: 112th Ave. SE Alignment	Proposal: 2b
<ul style="list-style-type: none"> Option 2.b.3 LRT in Trench Section at SE 4th St. - Once on the west side of 112th Ave. SE, the LRT transitions down into a trench (same as the MOU Project) along the west side of 112th Ave. SE. The trench section is lidded at SE 4th St. SE 4th St. crosses over the LRT on the trench section lid to maintain the present connection to 112th Ave SE and then the LRT transitions up in an open trench section until it meets grade at the East Main Station (common with the MOU project). Maintains vehicle and pedestrian traffic. 	
<p>Why Consider these Configurations:</p> <ul style="list-style-type: none"> All options provide grade separation between LRT and 112th Ave, SE. Options 2.b.1 and 2.b.2 eliminate the trench section and thereby lower project cost and risk. Options 2.b.2 and 2.b.3 provide access to Surrey Downs neighborhood via the SE 4th St. connection. Option 2.b.2 provides an optional “U” turn is provided in the vicinity of Main Street to provide northbound vehicles access to the neighborhood. Vehicle access at SE 4th St. by right-in/right-out movement providing pedestrian access as well. 	
<p>Design Considerations Addressed (From Sound Transit and City of Bellevue Cost Savings Work Plan - Motion M2012 -41 dated June 28, 2012):</p>	
<ul style="list-style-type: none"> <u>Work with the community on a package of changes in park use, neighborhood traffic control, other measures to mitigate change in access</u> - The Collaborative Design Process team developed three options for access to the Surrey Downs neighborhood and one design sub-option (optional connection to Bellefield Residential Park—see description above). Also, initial conversations were held with representatives of the neighborhood regarding likely changes in park use as a result of the light rail alignment options. Once a final alignment is established, the City will work with the community to revise the current park master plan to reflect the changed conditions. 	
<p>Traffic counts from 2000 and 2012 were reviewed for major access points to the Surrey Downs Neighborhood. At SE 4th and SE 1st, overall volumes decreased from 2000 to 2012. Combined, there are approximately 800 vehicles per day that use these two streets. These volumes would be redistributed throughout the neighborhood if access to 112th Ave. SE is closed. The neighborhood streets have the capacity to accommodate these volumes. The City would work with the neighborhood through the City’s neighborhood traffic safety services program to develop a package of traffic calming measures to help mitigate the impacts from the redistribution of volumes.</p>	
<ul style="list-style-type: none"> <u>Reduce the height of the reconstructed 112th Ave SE over light rail by depressing light rail tracks to the extent prudent given soil conditions.</u> - At the location of the reconstructed 112th over light rail, the top of rail has been located at the ground level as the available hydro-geotechnical data indicates groundwater close to the surface. The light rail is to stay at the proposed elevation until further geotechnical exploration is performed to determine the risks associated with depressing the LRT at this location. Therefore, the height of 112th Ave SE over the existing roadway is about the same - 23 ½ feet - as shown in the June 2012 open house. A decision to lower reconstructed 112th Ave. will have to be weighed against the increased cost (which will reduce the savings). 	
<ul style="list-style-type: none"> <u>Use landscaping to screen the road overpass and LRT</u> - Landscaping types that may contribute to screening have been identified for areas where sufficient space exists. 	
<ul style="list-style-type: none"> <u>Noise mitigation for at-grade LRT</u> – Preliminary noise impacts are discussed in this report and will be further analyzed in the upcoming environmental review if this cost savings idea is endorsed for further feasibility analysis. Preliminary noise mitigation is described below. 	

Description: 112th Ave. SE Alignment		Proposal: 2b
<ul style="list-style-type: none"> Evaluate pedestrian access to the E. Main St. Station from the neighborhood and kiss-and-ride access from 112th - As part of the work plan, the Collaborative Design Process team evaluated pedestrian access to the East Main station from the neighborhood and proposes a pedestrian walkway from SE 1st to the East Main station and a mid-block crosswalk from the east side of 112th (at approximately the location of SE 3rd). In addition, the team proposes two kiss-and-ride drop-off and pick-up locations, one on each side of 112th to accommodate those heading both north and south. 		
Cost Analysis		Range of Savings (2010 \$ M)
Option 2.b.1 – Emergency Access at SE 4th St. (with Bellefield Residential Park to Surrey Downs design option) *See Note below for cost impact Option 2.b.2 – General Access at SE 4th St. Option 2.b.3 – Lidded Trench Section at SE 4th St. (Similar to MOU Recommendation)		\$ 9 to \$ 16 \$ 7 to \$ 12 Same Approximate Cost as MOU Recommendation
* Note: If the Bellefield Rd to Surrey Downs Option is accepted then the Cost Savings Range is \$ 7 to 13 million.		
Resource	MOU Recommendation LRT Over 112 th Ave	Proposal: 2b: 112 th Ave Roadway Over LRT
LRT Operations	Complex vertical alignment with multiple grade changes and close vertical curves.	All options improve light rail operations due to fewer vertical changes in the alignment. Option 2.b.3 offers the least improvement as LRT still needs to descend and ascend as it passes through the trench area of the alignment.
LRT Access and Ridership	N/A	N/A
Traffic Impacts	Intersections along 112th Ave. SE operate acceptably.	Intersections along 112th Avenue SE operate similar to the MOU Recommendation.

Resource	MOU Recommendation LRT Over 112 th Ave	Proposal: 2b: 112 th Ave Roadway Over LRT
Vehicle Access	<p>SE 4th St. to 112th Ave. SE remains open.</p> <p>SE 8th St. at 112th Ave. SE remains a "T" intersection.</p> <p>Surrey Down Park access closed from 112th Ave. SE.</p>	<p><u>Option 2.b.1:</u> Emergency only access to/ from 112th Ave SE at SE 4th St. This alternative includes a design option for a road connection between Bellefield Residential Park and Surrey Downs neighborhood with access to SB 112th Ave. SE.</p> <p><u>Option 2.b.2 and 2.b.3:</u> General traffic access to SE 4th St. would be provided with Options 2.b.2 and 2.b.3.</p> <p><u>Option 2.b.2:</u> An optional "U" turn is provided in the vicinity of Main Street to provide northbound vehicles access to the neighborhood. Vehicle access at SE 4th St. is provided by right-in/right-out movement.</p> <p><u>All options:</u> Bellefield Residential and Office Park access to/from 112th Ave. SE at SE 15th St. is relocated and changed to right-in, right-out movements.</p>
Pedestrian Access	<p>SE 4th St. to 112th Ave. SE remains open.</p> <p>Surrey Downs Park access closed to/from 112th Ave. SE.</p> <p>Sidewalk provided along 112th Ave. SE.</p> <p>Pedestrian walkway from SE 1st St. to East Main Station provides pedestrian access to 112th Ave SE.</p>	<p><u>All options:</u> Sidewalks maintained on west side of 112th Ave. SE. A 14' multi-use path is extended on East side of 112th Ave north to SE 8th, which connects to an existing sidewalk from SE 8th St to Main St. Surrey Downs Park access closed from 112th Ave. SE.</p> <p>Pedestrian walkway from SE 1st St. to East Main Station provides pedestrian access to 112th Ave SE.</p> <p><u>Option 2.b.1</u> – West side sidewalk along 112th (no access to SE 4th)</p> <p><u>Option 2.b.2 and 2.b.3</u> – West side sidewalk is provided along 112th Ave. SE with access to SE 4th.</p>

Resource	MOU Recommendation LRT Over 112 th Ave	Proposal: 2b: 112 th Ave Roadway Over LRT
<p>Approximate Noise Impacts Light Rail and Traffic</p>	<p>Impacts: 49 LRT noise impacts west of 112th Avenue SE and south of Surrey Downs Park occurred from the elevated rail crossing 112th Avenue SE and transitioning to a trench on the west side of the road. Additional impacts occurred north of SE 4th related to the East Main Station. These impacts would be mitigated with sound walls, building sound insulation and special trackwork.</p> <p>East Main Station includes pedestrian crossing bells.</p>	<p><u>Option 2.b.1</u>: LRT Impacts: 35 <u>Option 2.b.2</u>: LRT Impacts: 33 <u>Option 2.b.3</u>: LRT Impacts: 30</p> <p>Reduced LRT noise impacts west of 112th Avenue SE would occur because the new roadway structure covers the LRT. Remaining impacts would occur from the proximity to the at-grade rail on the west side of 112th Ave. SE. These impacts would be mitigated with sound walls, building sound insulation and special trackwork.</p> <p>East Main Station includes pedestrian crossing bells for all options</p> <p>No traffic noise impacts result from raising 112th Ave SE over light rail.</p>
<p>Approximate Vibration Impacts</p>	<p>Impacts: 9</p> <p>Between Bellevue Way SE and East Main Station, there would be potential vibration impacts at 8 residences and the King County Courthouse (if it remains).</p> <p>Impacts can be mitigated with track vibration isolation such as ballast mats, resilient rail fasteners.</p>	<p><u>Option 2.b.1</u>: Impacts: 9 <u>Option 2.b.2</u>: Impacts: 10 <u>Option 2.b.3</u>: Impacts: 10</p> <p>All options between Bellevue Way SE and East Main Station would have potential vibration impacts at 8-9 residences and the King County Courthouse (if it remains).</p> <p>Potential impacts can be mitigated with track vibration isolation such as ballast mats, resilient rail fasteners.</p>

Resource	MOU Recommendation LRT Over 112 th Ave	Proposal: 2b 112 th Ave Roadway Over LRT
Visual Appearance	<p>Elevated section and straddle bent over 112th Ave. SE.</p> <p>Retained cut with high retaining walls in Surrey Downs Park.</p>	<p>All options reduce the height of the transit structures adjacent to Surrey Downs neighborhood. New structures include the elevated 112th Avenue SE flyover and associated retaining walls.</p> <p>Option 2.b.2 would also add a bridge and ramp structure and retaining walls for the SE 4th Street ramps.</p> <p>Option 2.b.3 would add retained cut along Surrey Downs Park and north to Main Street, which may reduce the visual presence of the light rail. It also has the same high retaining walls as the MOU Recommendation.</p>
Approximate Property Impacts	<p>Partial: 14</p> <p>Full: 14</p> <p>Residential Displacements: 48</p> <p>Business Displacements: 6</p>	<p>Option 2.b.1: Partial: 12; Full: 17; Residential Displacements: 52; Business Displacements: 6</p> <p>Option 2.b.2: Partial: 12; Full: 17; Residential Displacements: 52; Business Displacements: 6</p> <p>Option 2.b.3: Partial: 12; Full: 16; Residential Displacements: 51; Business Displacements: 6</p> <p>Option 2.b.1 would acquire one additional residence for the design option of a Surrey Downs neighborhood access road through the Bellefield Residential Park.</p>

Resource	MOU Recommendation LRT Over 112 th Ave	Proposal: 2b 112 th Ave Roadway Over LRT
Approximate Parklands Impacts	<p>No direct access to park from 112th Ave. SE: replaced with new access from SE 4th St.</p> <p>Parkland acquisition for alignment on east side of park.</p>	<p>No direct access to park from 112th Ave. SE For Options 2.b.1 and 2.b.2, new park access road from SE 4th Street.</p> <p>Access for Option 2.b.3 would be the same as the MOU Recommendation.</p> <p>All options would have similar parkland acquisition as MOU Recommendation.</p>
Approximate Wetlands Impacts	Wetlands buffer adjacent to Mercer Slough waterway impacted.	More wetlands buffer impacted.

3.2.2 Cost Savings Ideas 2b– 112th Ave SE Alignment

The following map identifies the location of the 112th Ave. SE Alignment Cost Savings Idea and shows the location of the following graphics/figures.

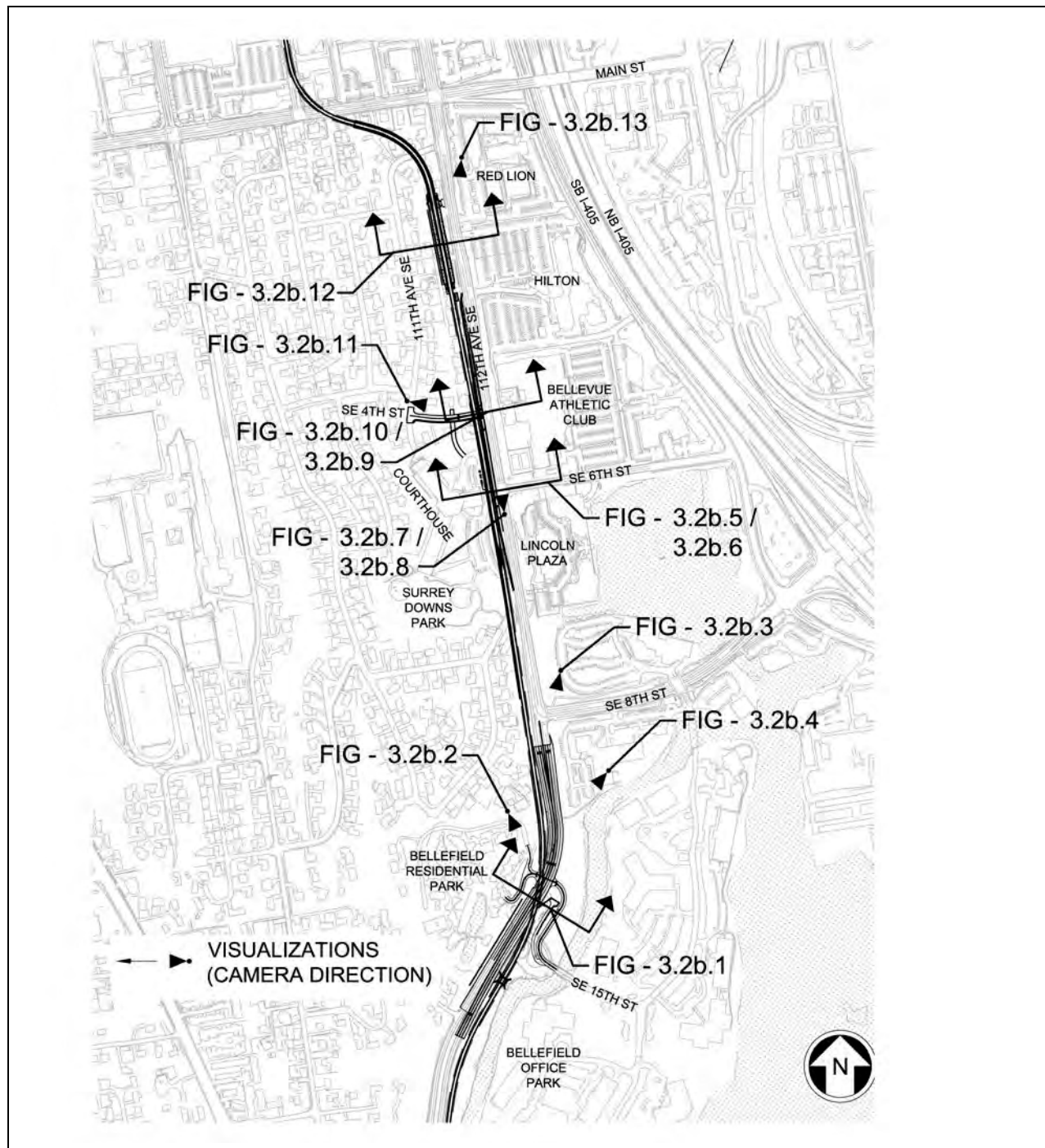


Figure 3.2b.0:
112th Ave. SE Alignment—2b

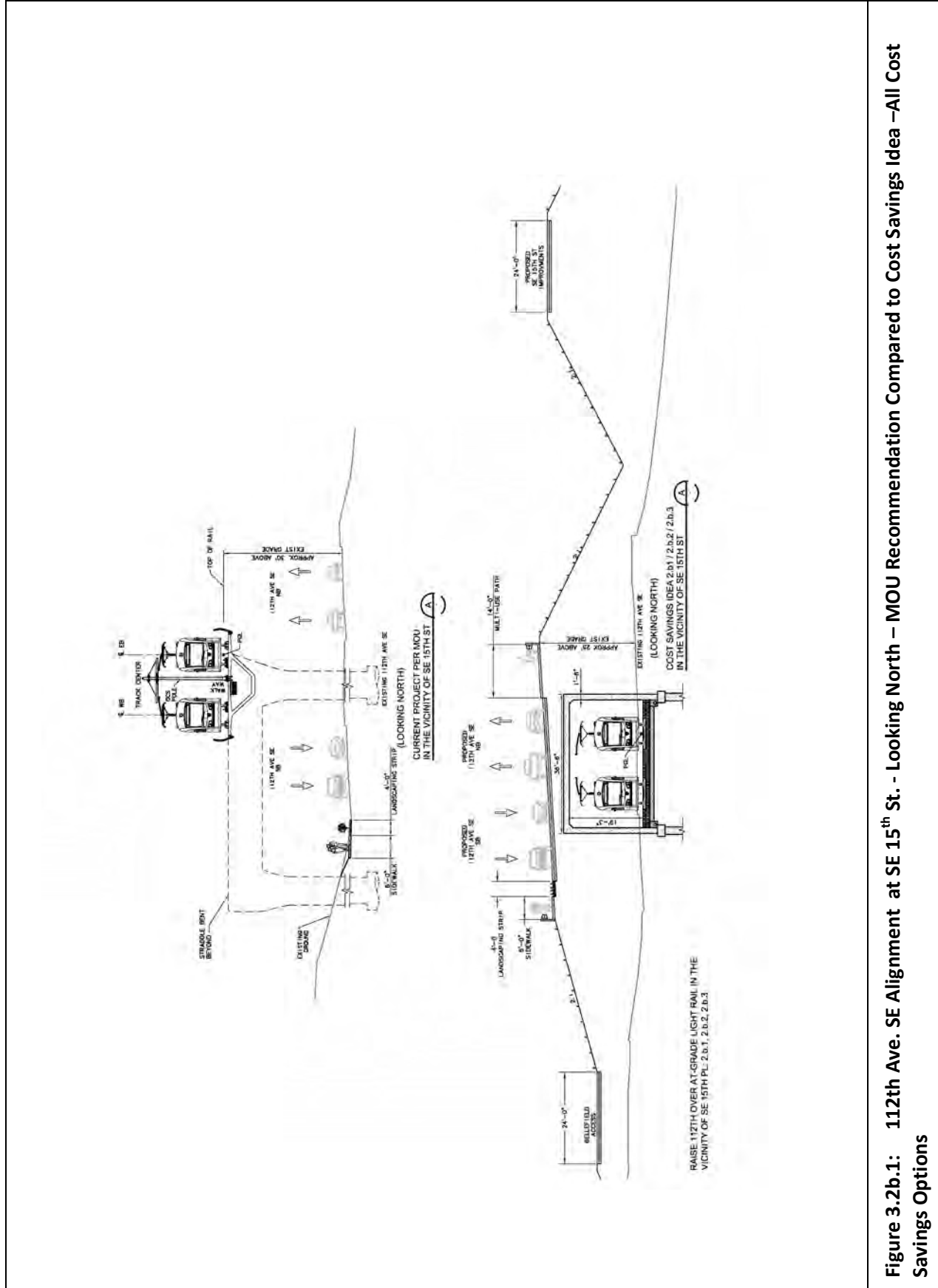




Figure 3.2b.2: 112th Ave. SE Alignment at SE 15th St. –Looking East from Bellefield Park Residential – All Cost Savings Options



Figure 3.2b.3: 112th Ave. SE Alignment Looking South at SE 8th St. – MOU Recommendation



Figure 3.2b.4: 112th Ave. SE Alignment Looking South of SE 8th St. – All Cost Savings Options (without Bellefield Residential Park to Surrey Downs Connection Design Option)

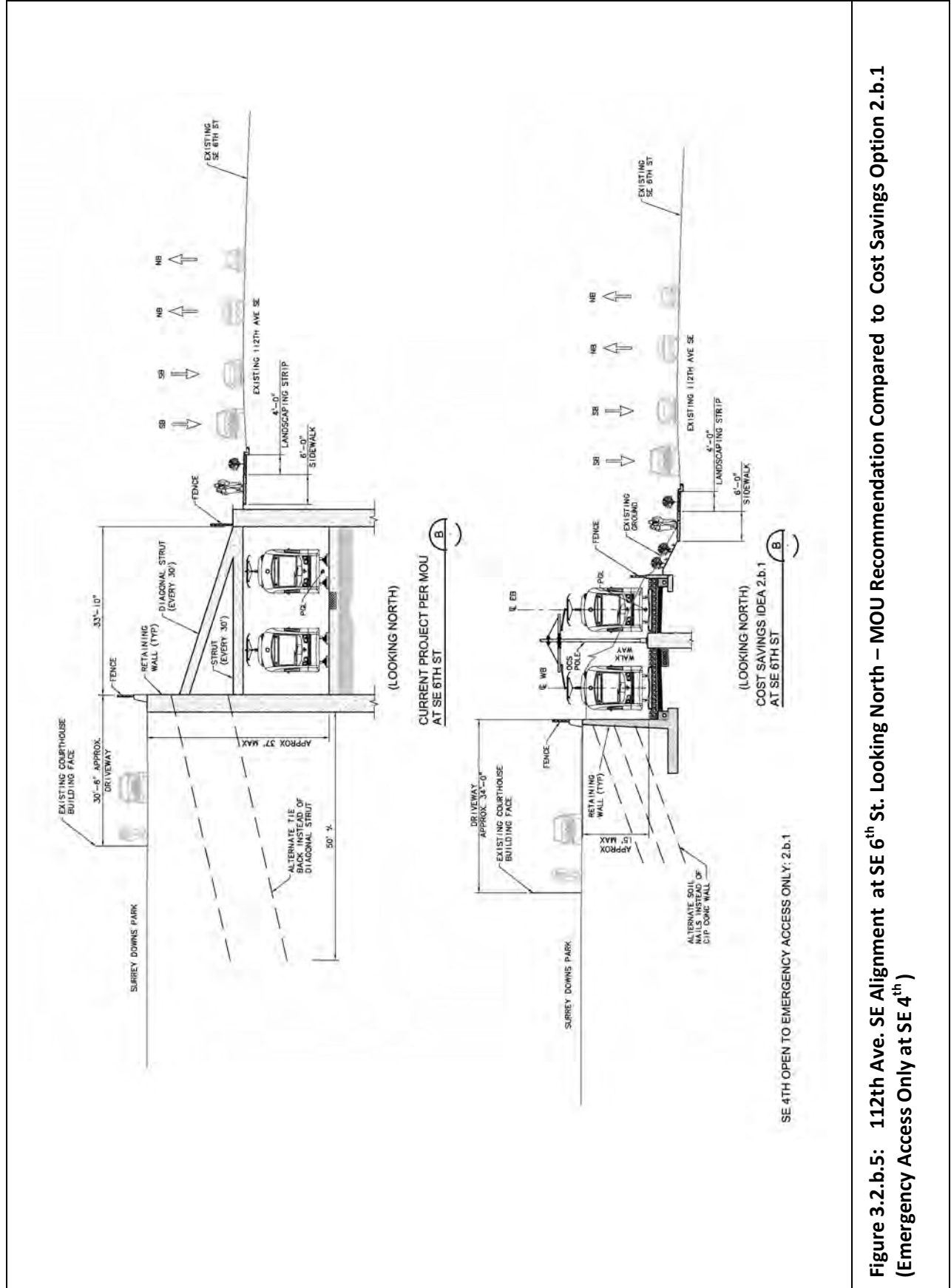


Figure 3.2.b.5: 112th Ave. SE Alignment at SE 6th St. Looking North – MOU Recommendation Compared to Cost Savings Option 2.b.1 (Emergency Access Only at SE 4th)

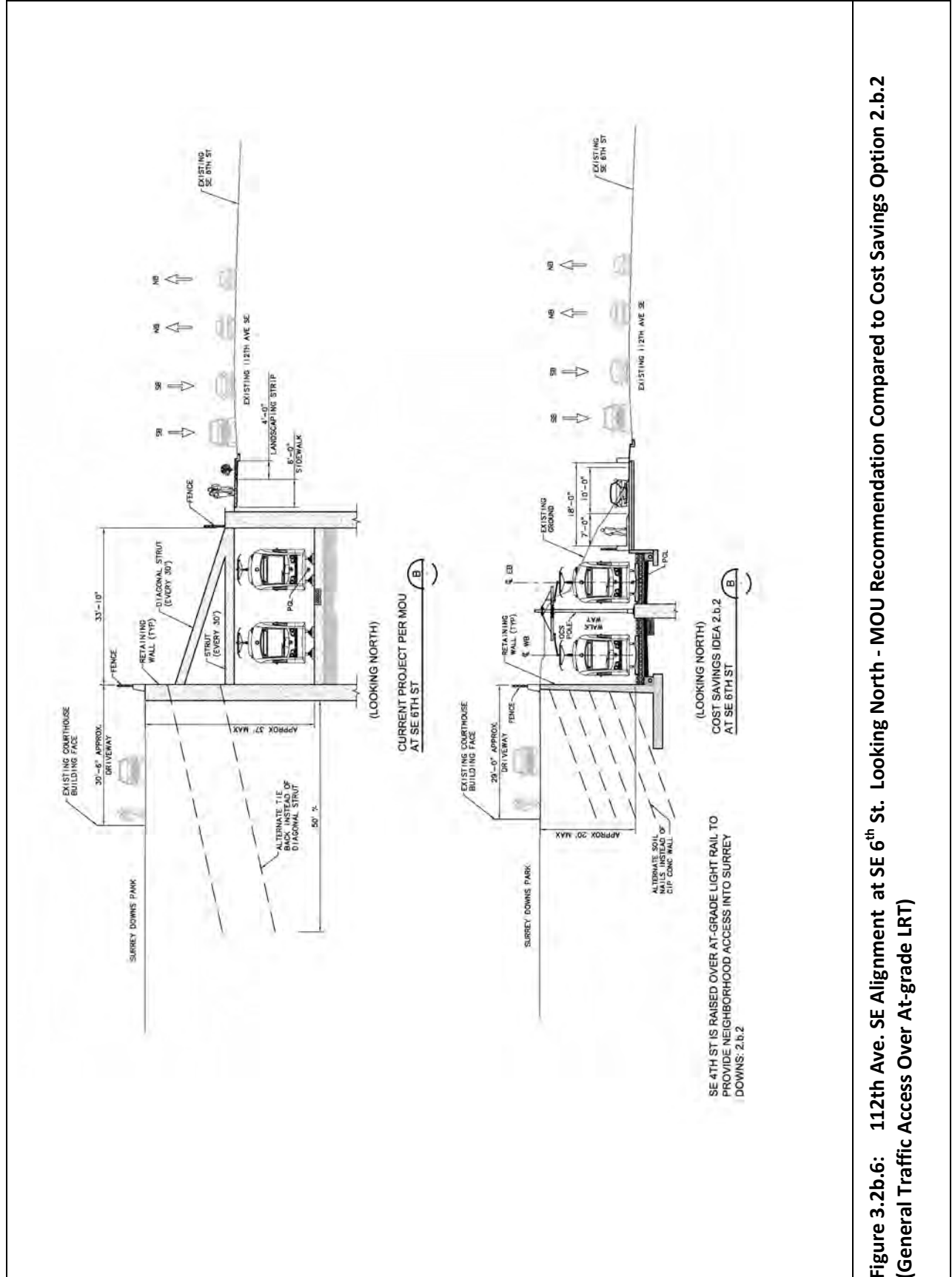


Figure 3.2b.6: 112th Ave. SE Alignment at SE 6th St. Looking North - MOU Recommendation Compared to Cost Savings Option 2.b.2 (General Traffic Access Over At-grade LRT)



Figure 3.2b.7: 112th Ave. SE Alignment Looking North at SE 6th St. – MOU Recommendation and Cost Savings Option 2.b.3



Figure 3.2b.8: 112th Ave. SE Alignment Looking North of SE 6th St. – Cost Savings Option 2.b.2 – Streetview

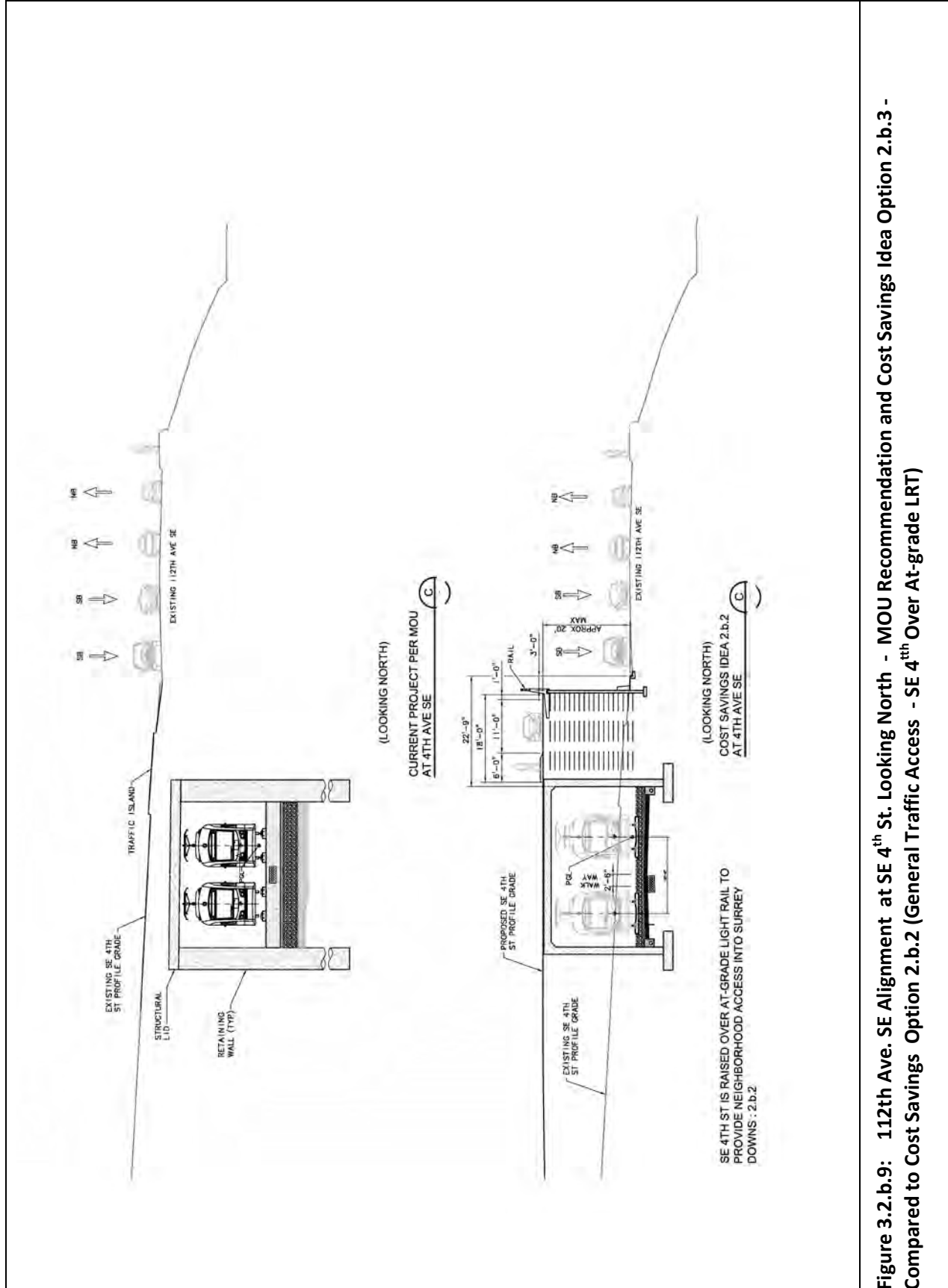


Figure 3.2.b.9: 112th Ave. SE Alignment at SE 4th St. Looking North - MOU Recommendation and Cost Savings Idea Option 2.b.3 - Compared to Cost Savings Option 2.b.2 (General Traffic Access - SE 4th Over At-grade LRT)

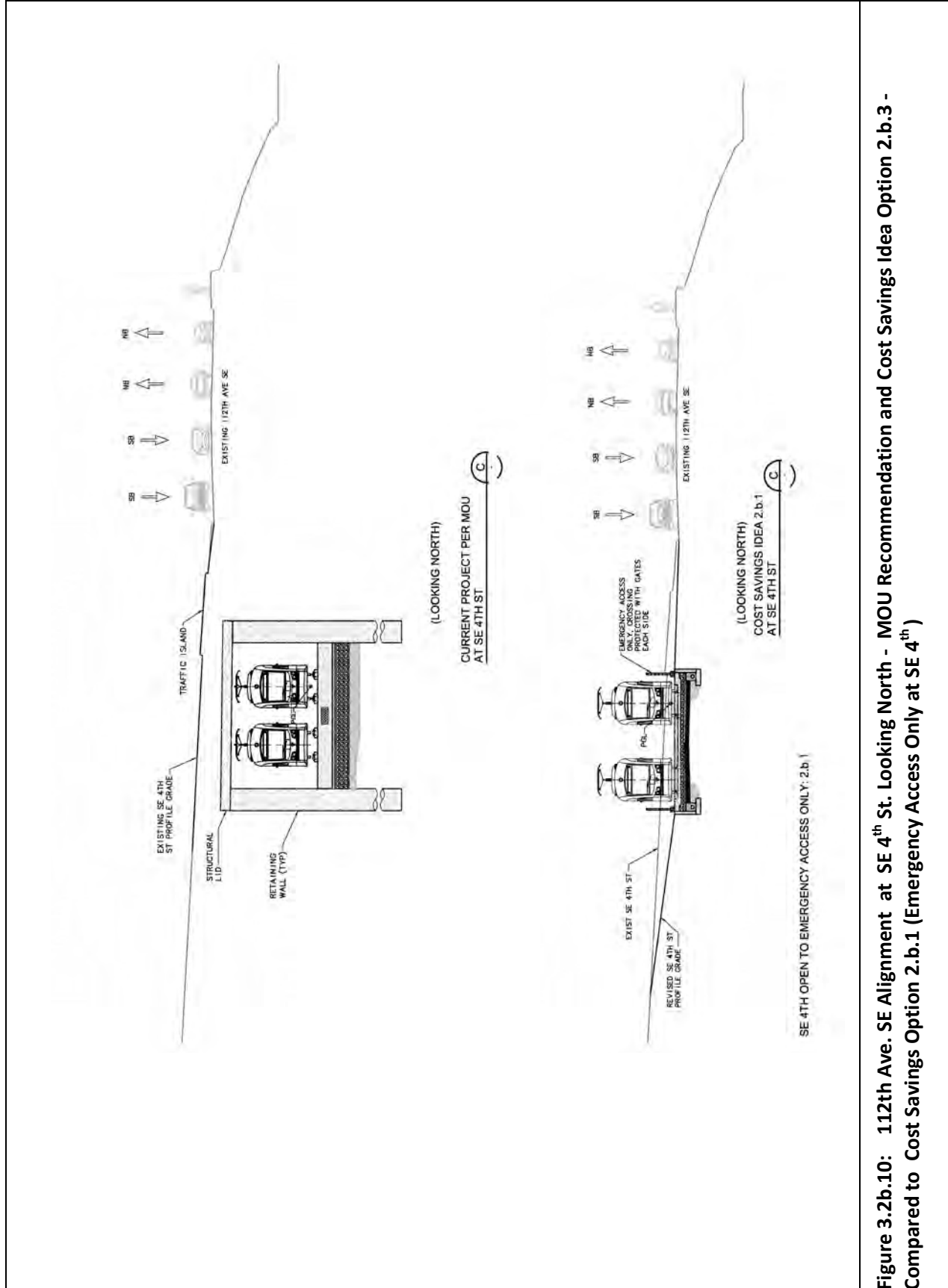
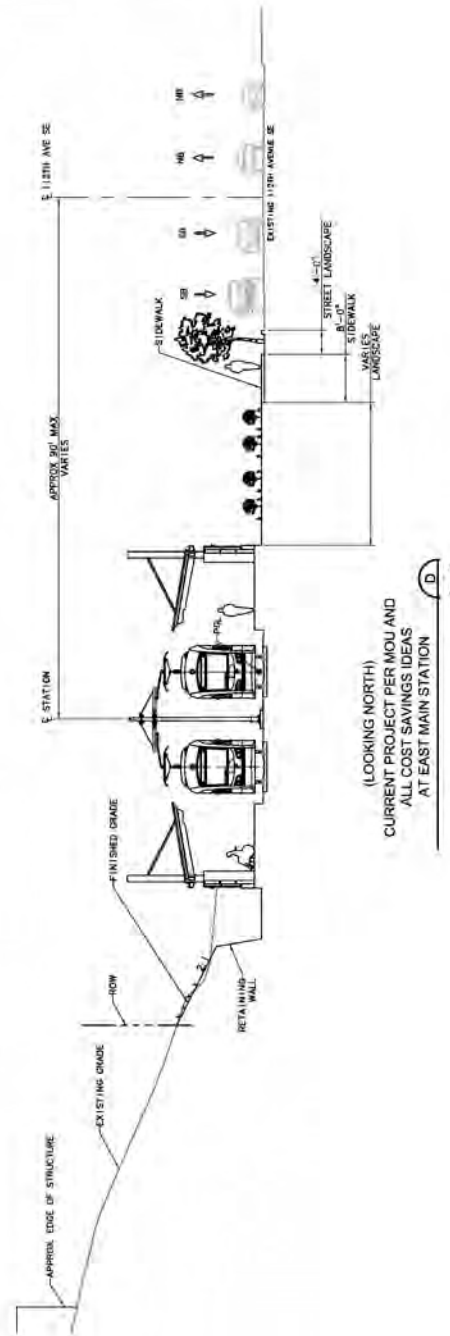


Figure 3.2b.10: 112th Ave. SE Alignment at SE 4th St. Looking North - MOU Recommendation and Cost Savings Idea Option 2.b.3 - Compared to Cost Savings Option 2.b.1 (Emergency Access Only at SE 4th)



Figure 3.2b.11: 112th Ave. SE Alignment at SE 4th St. Over At-grade Light Rail – Looking East from SE 4th St. and 111th Pl. SE Cost Savings Option 2.b.2



EAST MAIN STATION: 2.b.1, 2.b.2, 2.b.3

Figure 3.2b.12: 112th Ave. SE Alignment –East Main Station – MOU Recommendation and All Cost Savings Options



Figure 3.2b.13: 112th Ave. SE Alignment –East Main Station–Looking South - Cost Savings Option 2.b.2

3.3 Downtown Station Design

3.3.1 Cost Savings Idea 3e –Optimize Adopted Project (PE)

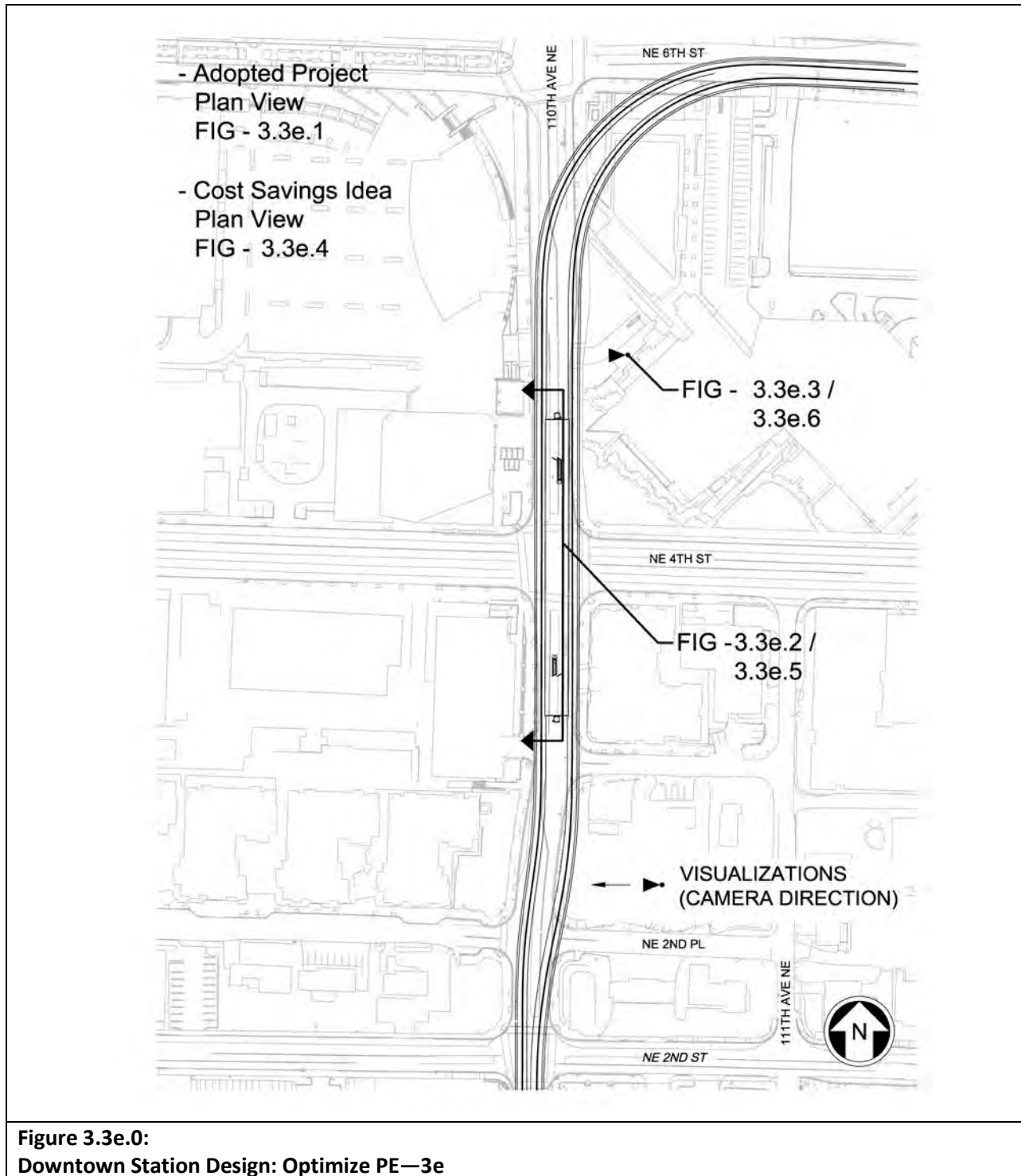
Table 3-4

Cost Savings Evaluation: Downtown Station Design – Optimize Adopted Project (PE) - 3e

Description: Downtown Station Design - Optimize Adopted Project	Proposal: 3e
<p>MOU Project: Provides a cut-and-cover tunnel and station with tracks side-by-side, with track spacing widening at the station to provide for a center platform and mezzanine above to transition passengers from center to side(s) of 110th Ave. NE.</p>	
<p>Cost Savings Idea (3e): Optimize Adopted Project (Preliminary Engineering - PE) - The first phase of advancing the PE included analysis of design refinements to the station structure only, and included the removal of 50 feet of mezzanine at each end of the station. In addition, the PE design included a pair of up and down escalators plus public stairs at each end of the platform; these were changed to an up escalator and down stair at each end, reducing the number of escalators by two. It also reduced the station, platform and tunnel width by 2 feet from the current PE design. This Cost Savings Idea evaluates the relocation of the North Station Entrance from its current location in front of City Hall to the West Side of 110th Ave in front of the City Center Plaza building. This option would also locate the stair, escalator and elevator outside of the foundation wall of City Center Plaza. The current phase includes further analysis of the track alignment between the East Main Station and the north tunnel portal (“portal to portal”) and a further analysis of ventilation requirements.</p> <p>Why Consider this Configuration:</p> <ul style="list-style-type: none"> • It would provide a west side entrance closer to the Bellevue Transit Center to facilitate bus transfers and access into downtown Bellevue. • This Cost Savings Idea reduced the station, platform, and tunnel width from current adopted project (PE design) and raised the tunnel alignment. • This Cost Savings Idea optimizes LRT operations through the tunnel. It maintains operational speed and trip time at both NE 6th St. and crossing I-405. • This option maintains four travel lanes on 110th Ave NE between NE 4th and NE 6th St. Although the option removes the dedicated northbound left-turn into the Bellevue Transit Center, a left turn only movement for buses into the Bellevue Transit Center may be considered. <p>Design Considerations Addressed (From Sound Transit and City of Bellevue Cost Savings Work Plan - Motion M2012 -41 dated June 28, 2012):</p> <ul style="list-style-type: none"> • <u>Optimize configuration to minimize impacts to surface traffic while retaining entrances north and south of NE 4th.</u> The PE design was optimized to look for cost savings. Option maintains four lanes on NE 110th Ave. and four lanes on NE 6th St. This Cost Savings Idea removes the dedicated northbound left-turn into the Bellevue Transit Center. However, a left turn only movement for buses, only, into the Bellevue Transit Center may be considered. 	

3.3.2 Cost Savings Ideas 3e– Optimize PE Design

The following map identifies the location of the Cost Savings Idea and shows the location of the following graphics/figures.



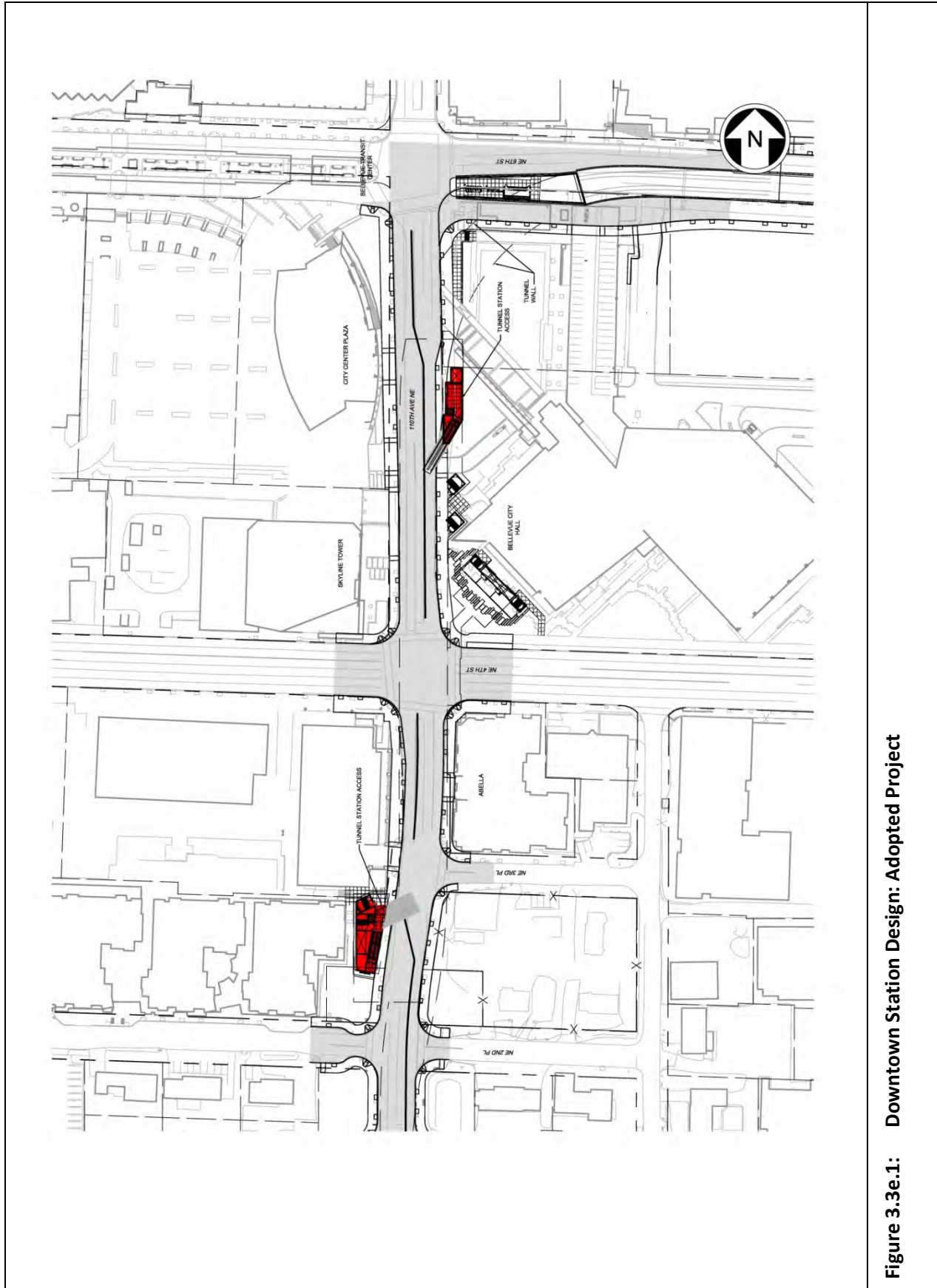


Figure 3.3e.1: Downtown Station Design: Adopted Project

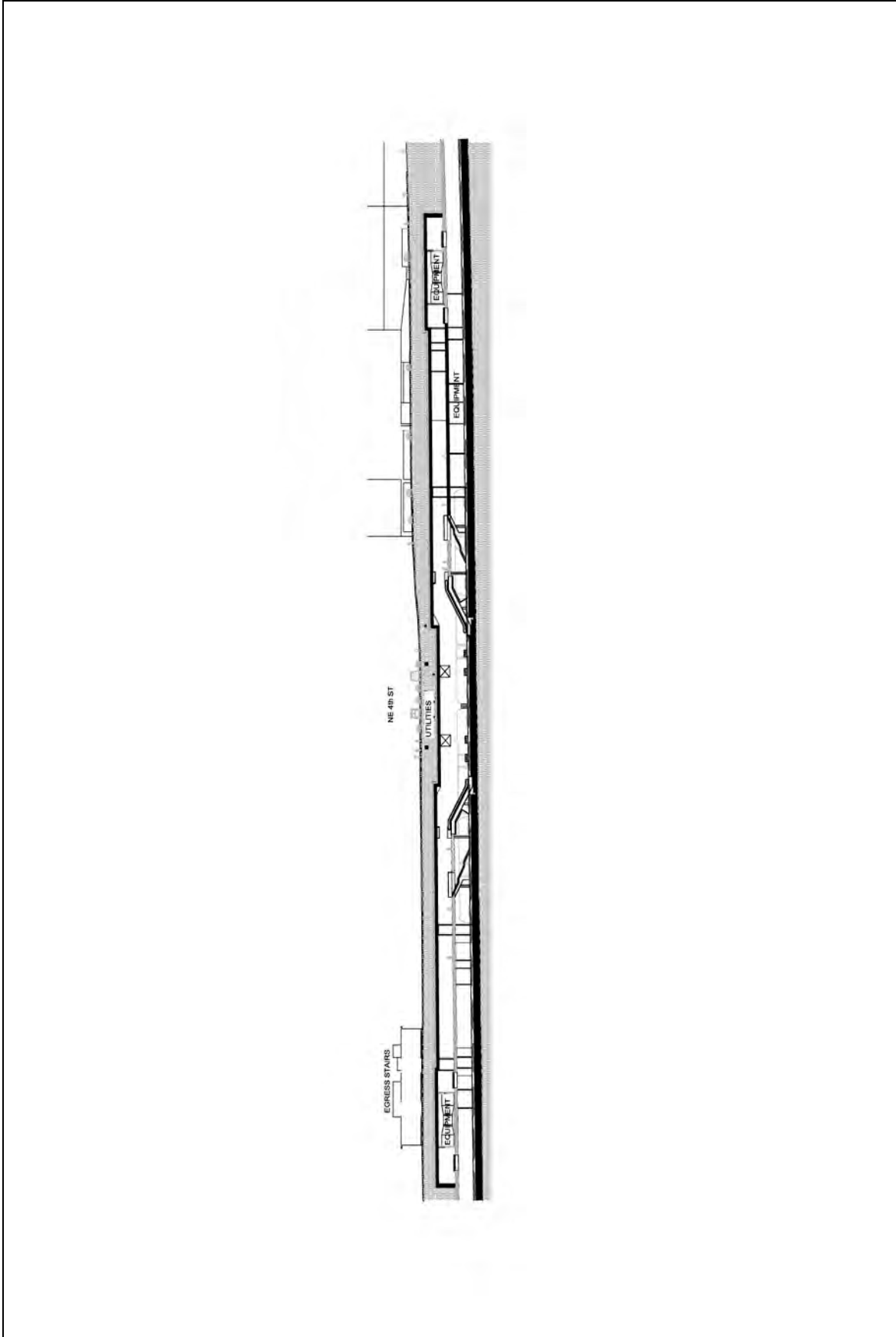


Figure 3.3e.2: Downtown Station Design: Adopted Project

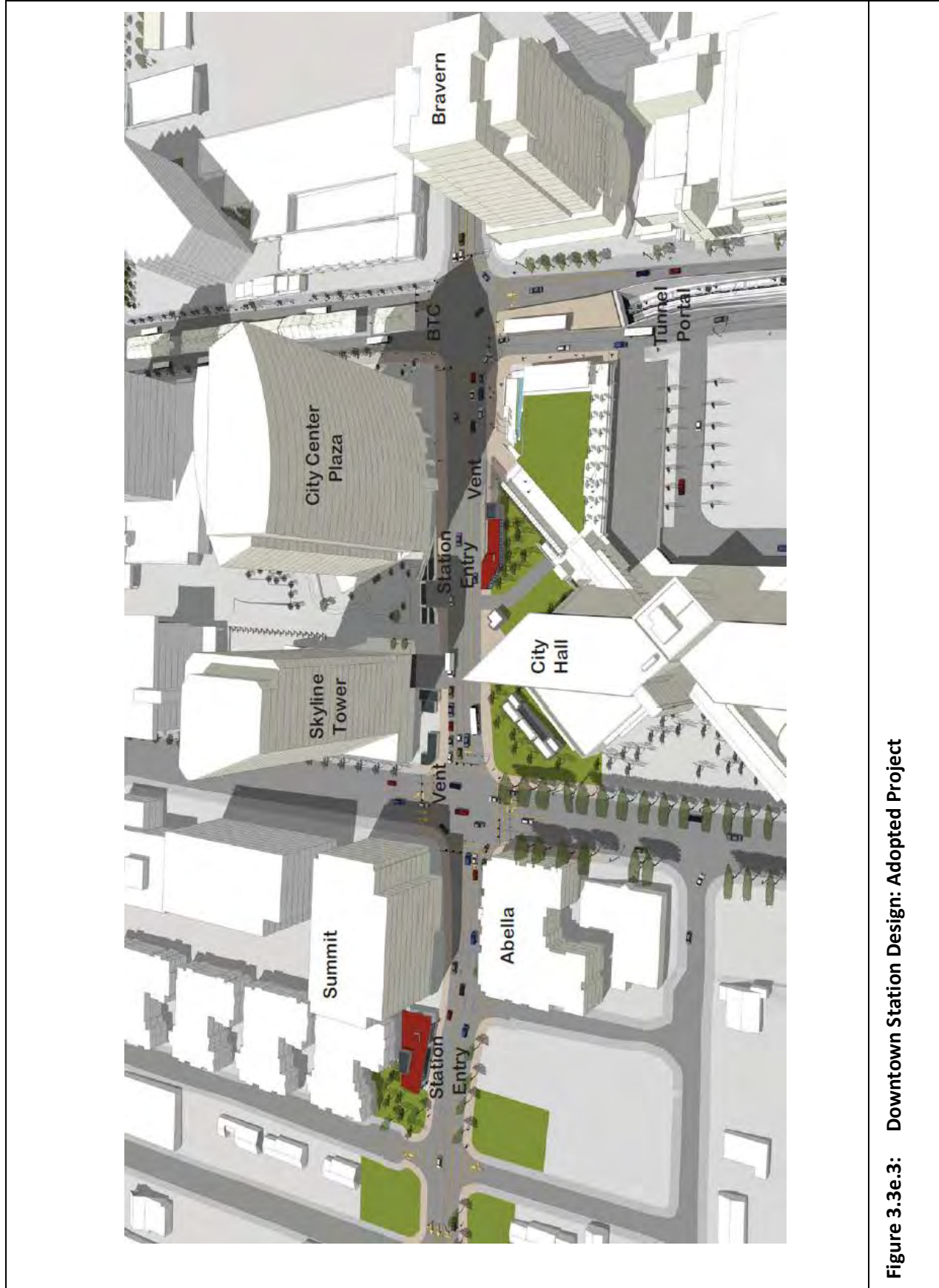


Figure 3.3e.3: Downtown Station Design: Adopted Project

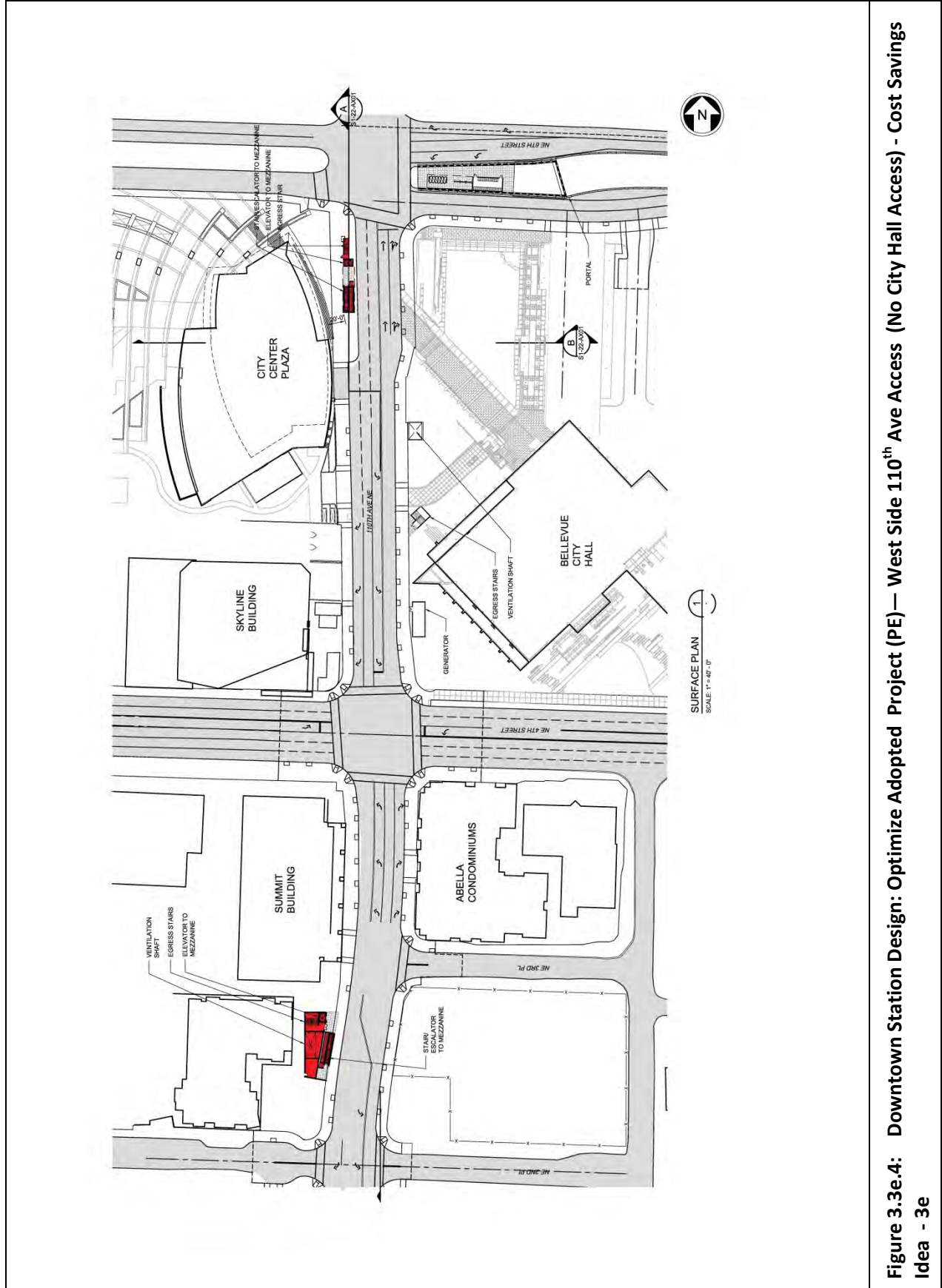


Figure 3.3e.4: Downtown Station Design: Optimize Adopted Project (PE)— West Side 110th Ave Access (No City Hall Access) - Cost Savings Idea - 3e

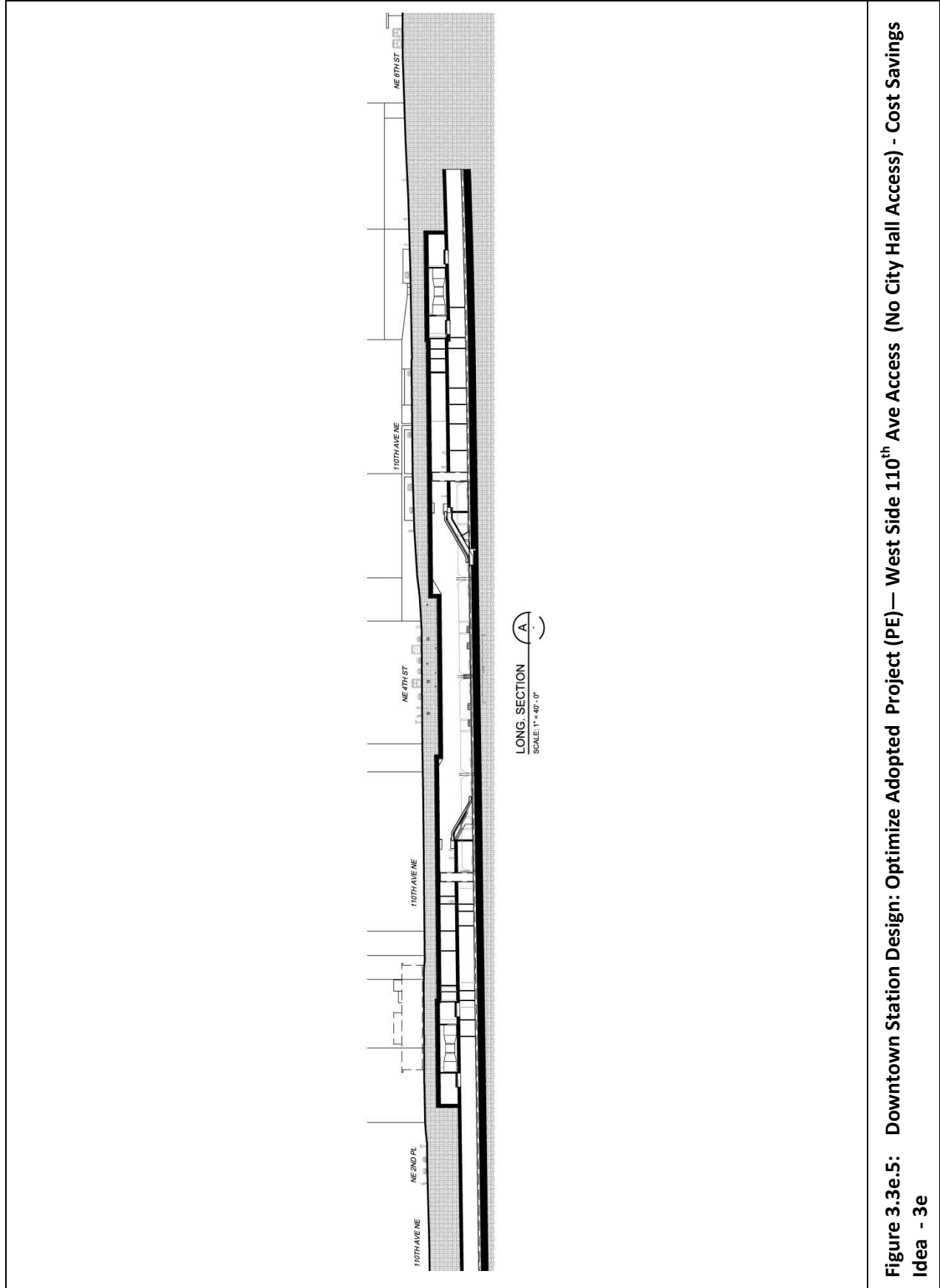


Figure 3.3e.5: Downtown Station Design: Optimize Adopted Project (PE)— West Side 110th Ave Access (No City Hall Access) - Cost Savings Idea - 3e



Figure 3.3e.6: Downtown Station Design: Optimize Adopted Project (PE)— West Side 110th Ave Access (No City Hall Access) - Cost Savings Idea - 3e

3.3.3 Cost Savings Idea 3b –Stacked Tunnel Configuration

Table 3-5

Cost Savings Evaluation: Downtown Station Design – Stacked Tunnel Configurations - 3b

Description: Downtown Station Design	Proposal: 3b
<p>MOU Project: Provides a cut-and-cover tunnel and station with tracks side-by-side, with track spacing widening at the station to provide for a center platform and mezzanine above to transition passengers from center to side(s) of 110th Ave. NE.</p>	
<p>Cost Savings Idea (3b): Stacked Tunnel - This idea would provide a stacked tunnel concept –stacking the northbound and southbound trackways of the station and requiring vertical access within the 110th Ave NE right-of-way. This results in a deeper but narrower excavation, with fewer elevators and less floor area within the station. This Cost Savings Idea would provide the southernmost entrance and exit facilities South of NE 4th St. while providing a pedestrian passageway to allow the northernmost entrance to be placed on the west side of 110th Ave NE across from the Bellevue Transit Center. This option maintains four travel lanes on 110th Ave NE between NE 4th St. and NE 6th St. and two travel lanes between NE 2nd St. and NE 4th St.</p> <p>Why Consider this Configuration:</p> <ul style="list-style-type: none"> • It would eliminate the mezzanine and reduce width of station and width of tunnel excavation, resulting in a more compact station. • It would provide one west side entrance close to Bellevue Transit Center facilitating bus transfers and better access into downtown Bellevue. • It maintains operational speeds and trip time at both NE 6th St. and crossing I-405. • This option maintains four travel lanes on 110th Ave NE at NE 6th St. Although the option removes the dedicated northbound left-turn into the Bellevue Transit Center, a left turn only movement for buses into the Bellevue Transit Center may be considered. <p>Design Considerations Addressed (From Sound Transit and City of Bellevue Cost Savings Work Plan - Motion M2012-41 dated June 28, 2012):</p> <ul style="list-style-type: none"> • <u>May involve stacked tunnel with one entrance setback from street and mitigation for loss of turn pocket south of NE 4th.</u> The stacked tunnel station option north entrance was changed from the June 2012 stacked tunnel to accommodate an additional lane on 110th Ave. NE between NE 4th St. and NE 6th St. Preliminary traffic and vehicle access impacts are described in Table 3.7. 	

3.3.4 Cost Savings Idea 3b – Stacked Tunnel Configuration

The following map identifies the location of the Cost Savings Idea and shows the location of the following graphics/figures.

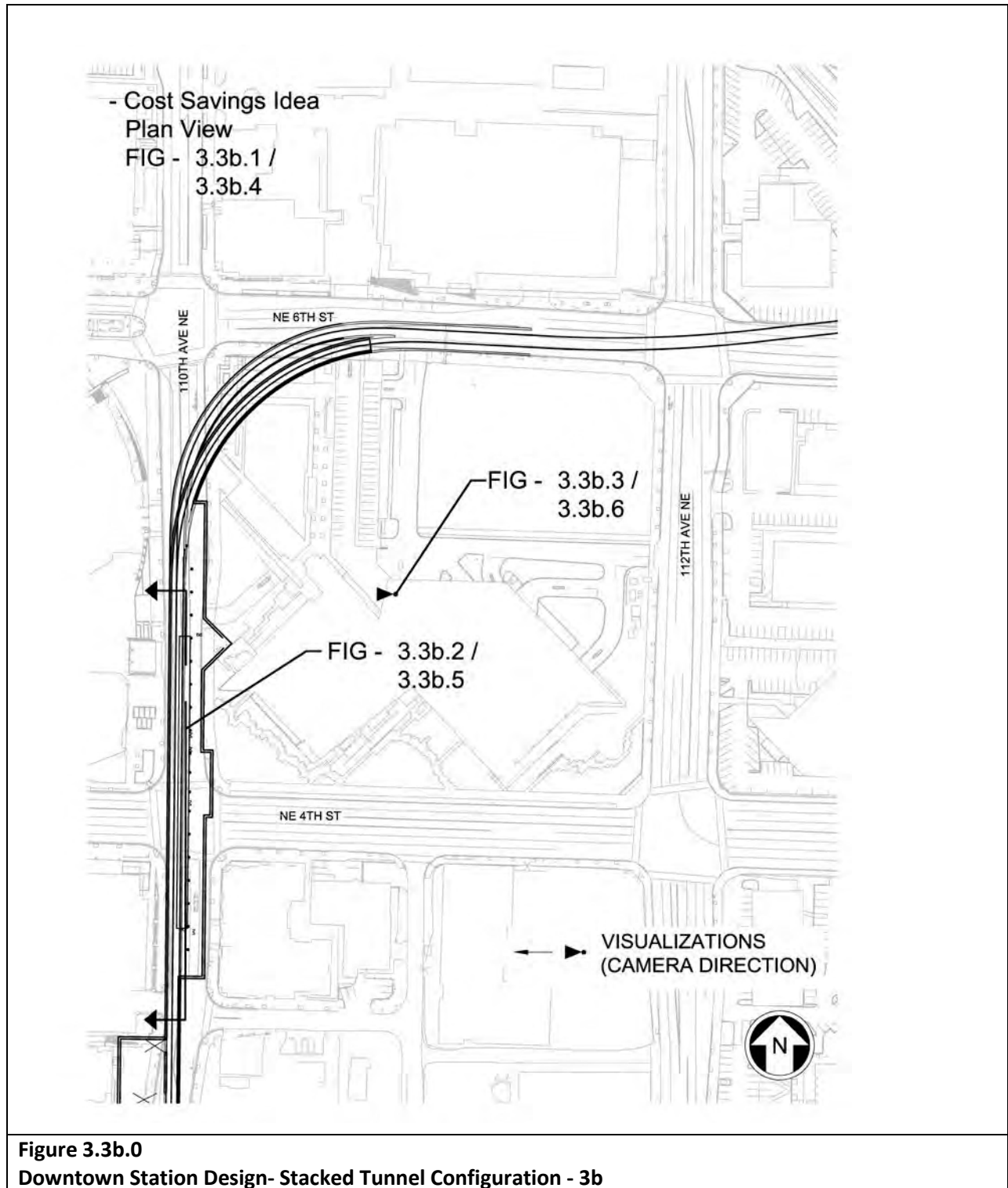


Figure 3.3b.0
Downtown Station Design- Stacked Tunnel Configuration - 3b

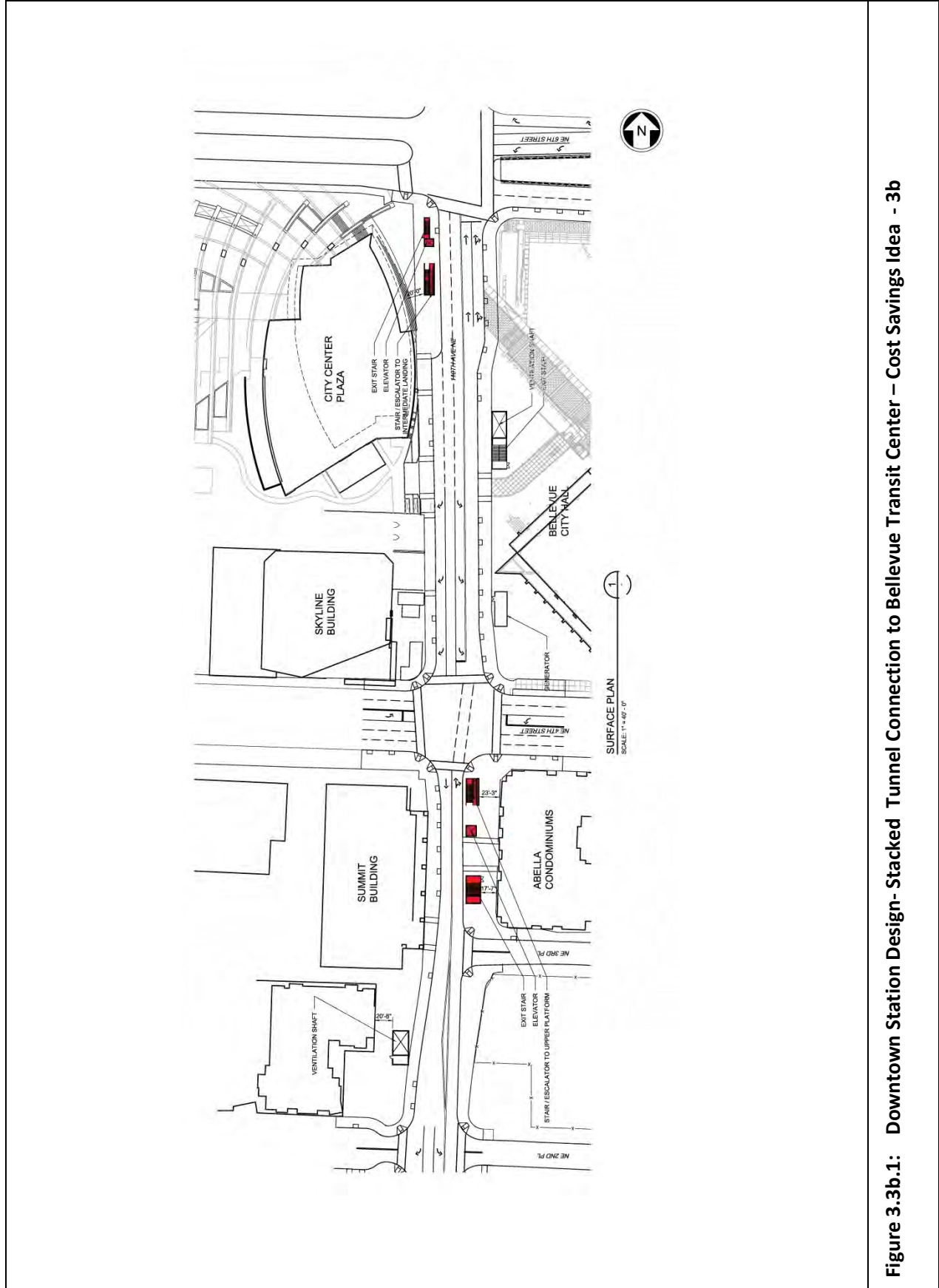


Figure 3.3b.1: Downtown Station Design- Stacked Tunnel Connection to Bellevue Transit Center – Cost Savings Idea - 3b

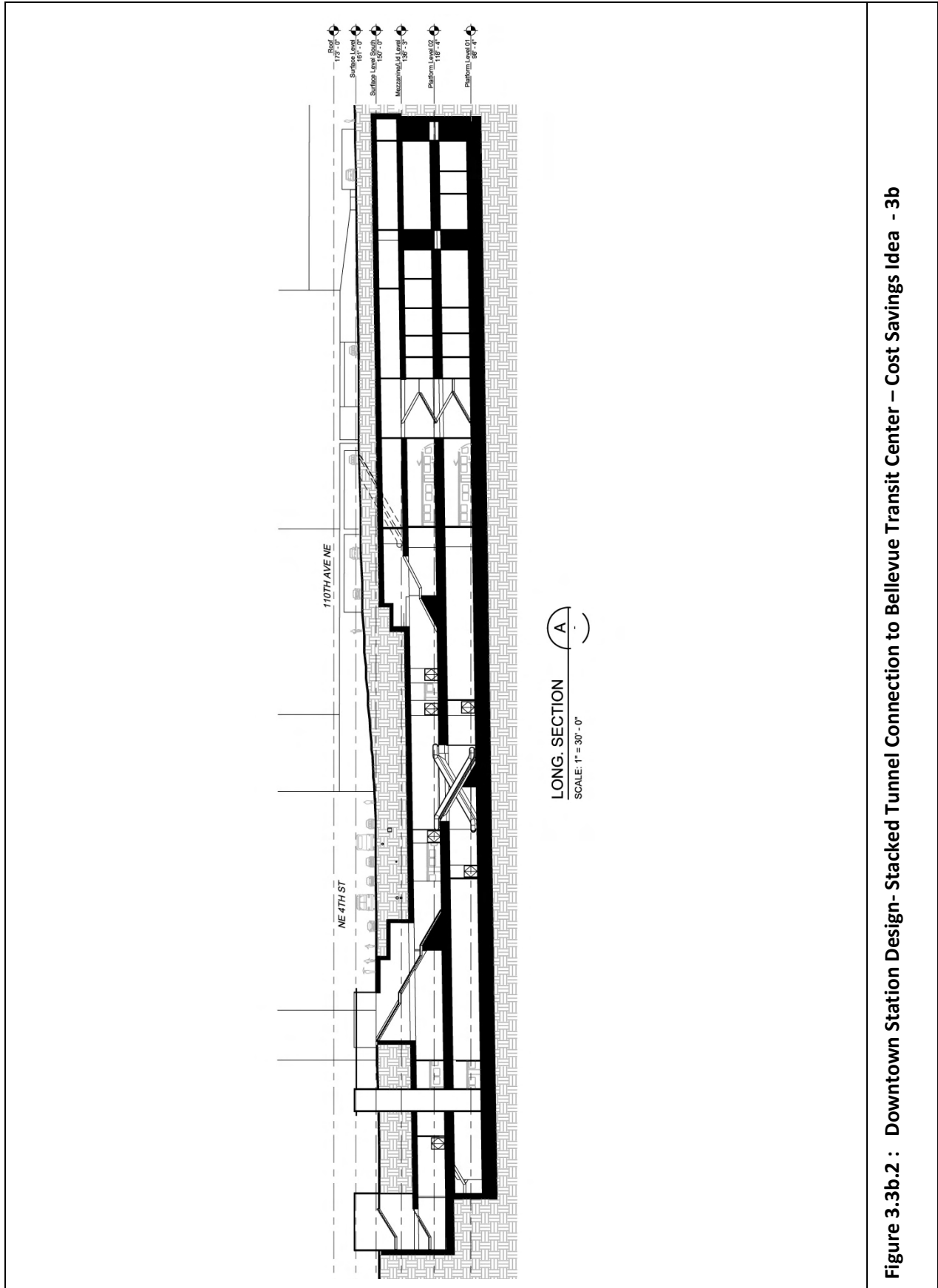


Figure 3.3b.2 : Downtown Station Design- Stacked Tunnel Connection to Bellevue Transit Center – Cost Savings Idea - 3b

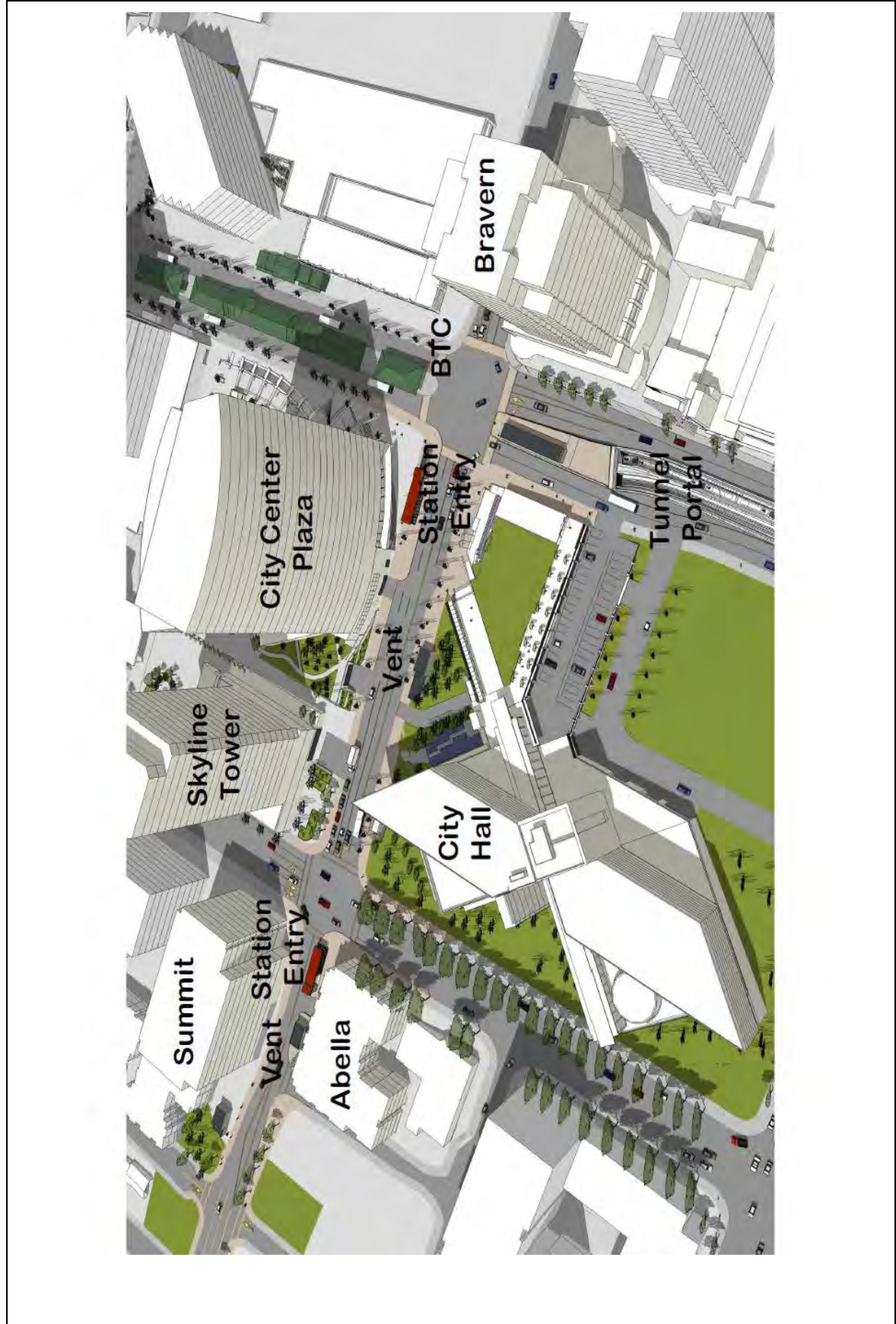


Figure 3.3b.3: Downtown Station Design- Stacked Tunnel Connection to Bellevue Transit Center – Cost Savings Idea - 3b

3.3.5 Cost Savings Idea – Relocate Station to NE 6th St. – 3c

Table 3-6

Cost Savings Evaluation: Downtown Station Design – Relocate Station to NE 6th St - 3c

Description: Downtown Station Design	Proposal: 3c
<p>MOU Project: Provides a cut-and-cover tunnel and station with tracks side-by-side, with track spacing widening at the station to provide for a center platform and mezzanine above to transition passengers from center to side(s) of 110th Ave. NE.</p>	
<p>Cost Savings Idea (3c): Relocate Station to NE 6th St – This idea would move the station to the south edge of the NE 6th St. corridor, the station is “daylighted”, and the side platforms become partly on-grade and partly elevated as it approaches 112th Ave. NE. This configuration features surface access from the City Hall plaza. The platform has public access only from the west end.</p> <p>Vertical circulation from the west end of the side platform is by means of elevators, escalators and stairs down from the City Hall Plaza. The east end of the side platform is served by emergency egress stairs only.</p> <p>By moving the station from its current PE location in 110th Ave, a vertical realignment of the tunnel is possible, resulting in a shallower tunnel.</p> <p>Why Consider this Configuration:</p> <ul style="list-style-type: none"> • Eliminates underground station construction costs. • Maintains current configuration of 110th Ave. NE and NE 6th St. • Maintains an entrance near City Hall and the Bellevue Transit Center. <p>Design Considerations Addressed (From Sound Transit and City of Bellevue Cost Savings Work Plan - Motion M2012-41 dated June 28, 2012):</p> <ul style="list-style-type: none"> • <u>Reach agreement on impacts to City Hall and damages payment prior to further design</u> – The Collaborative Design Process Team will reach agreement on the extent of impacts to City Hall and compensation for damages prior to a decision to select this Cost Savings Idea. • <u>Determine acceptability of design deviation (curve at 110th/NE 6th)</u> – Current conceptual design results in a design deviation (curve at 110th/NE 6th and curve from station to I-405) resulting in slower LRT operational speeds through the station area. Speeds are reduced from 20 mph to 10 mph west of the station and from 35 mph to 20 mph east of the station. 	

3.3.6 Cost Savings Idea 3c – Relocate Station to NE 6th

The following map identifies the location of the Cost Savings Idea and shows the location of the following graphics/figures.

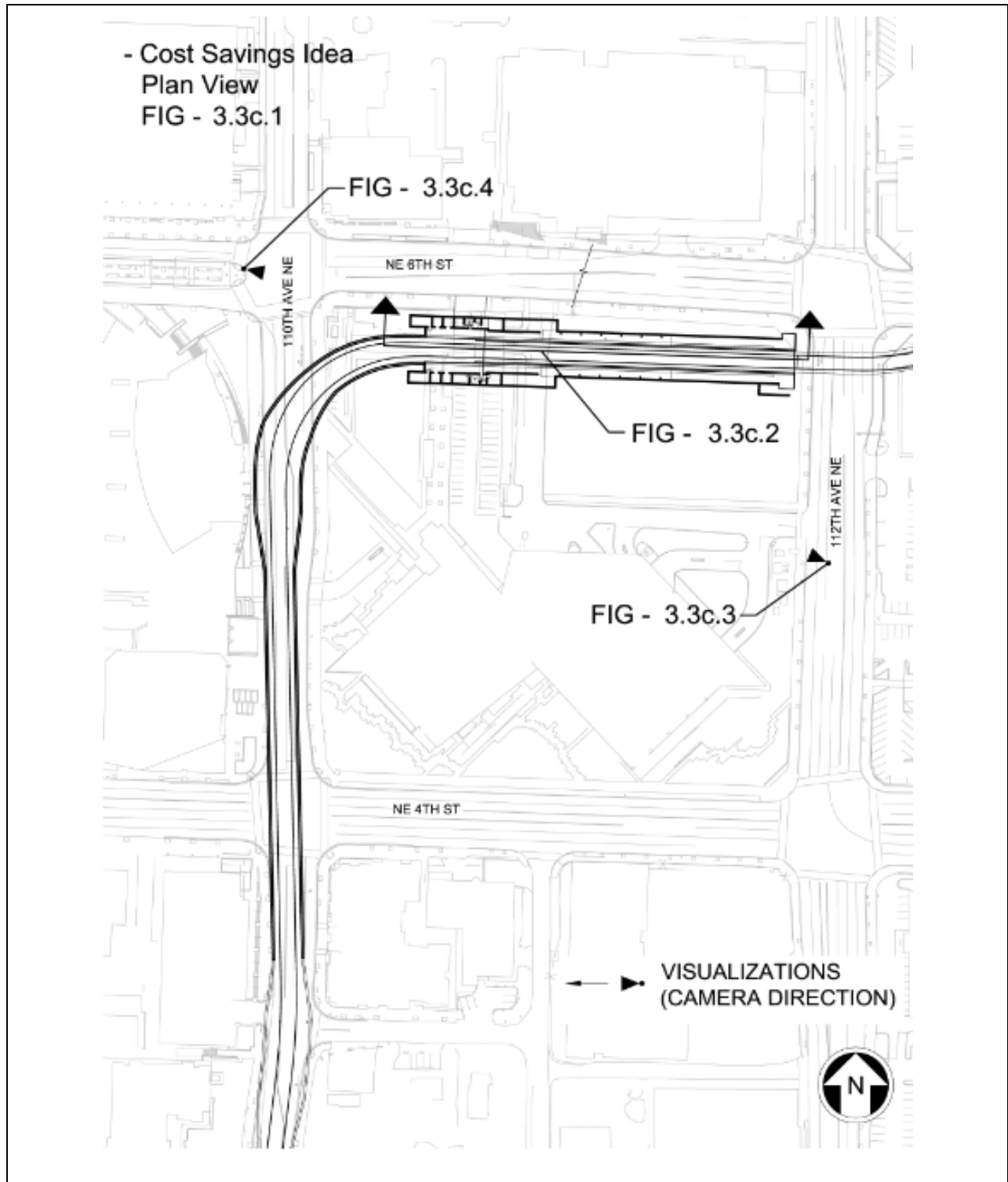


Figure 3.3c.0:
Downtown Station Design - Relocate Station to NE 6th—3c

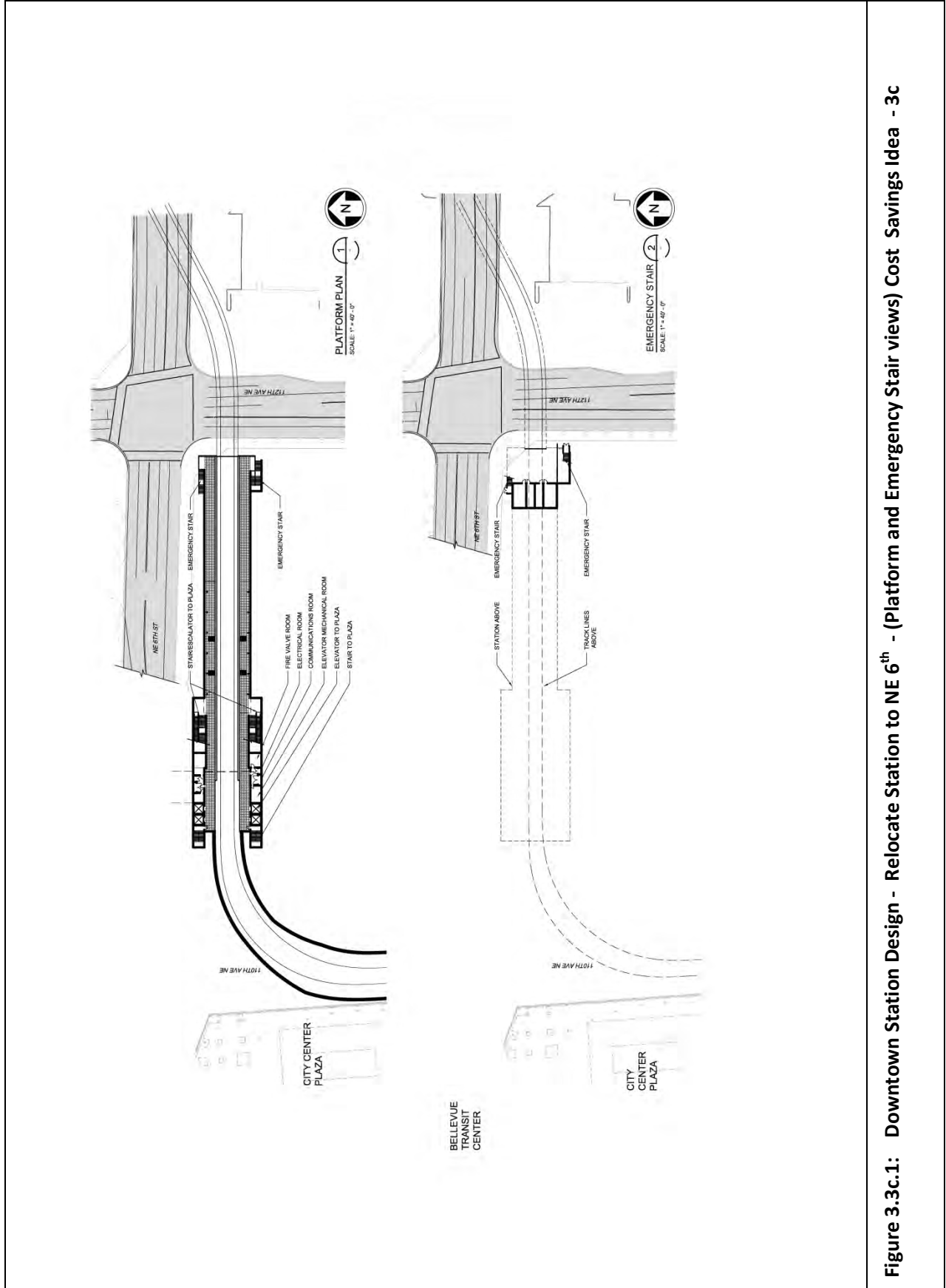


Figure 3.3c.1: Downtown Station Design - Relocate Station to NE 6th - (Platform and Emergency Stair views) Cost Savings Idea - 3c

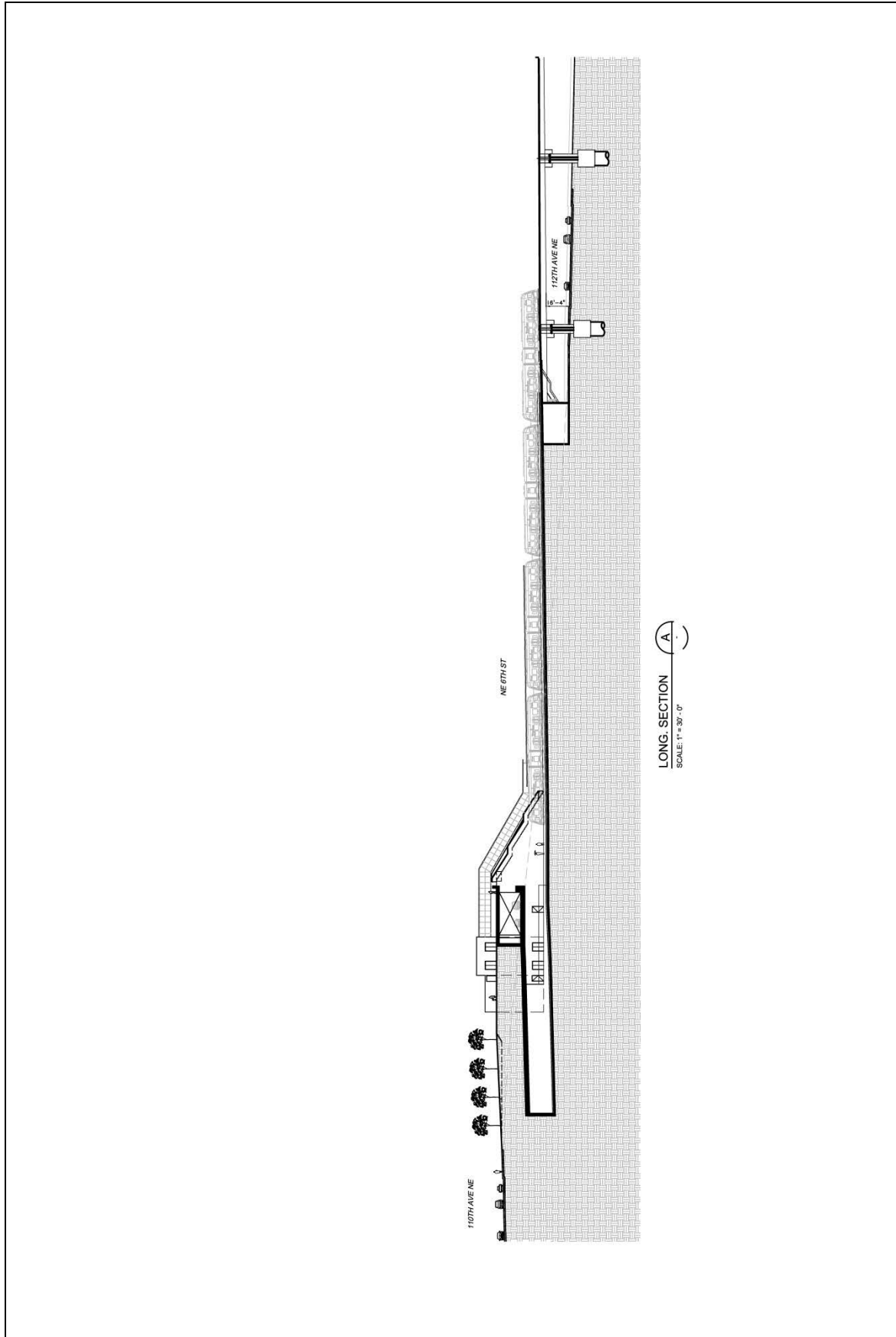


Figure 3.3c.2: Downtown Station Design - Relocate Station to NE 6th – Cost Savings Idea - 3c

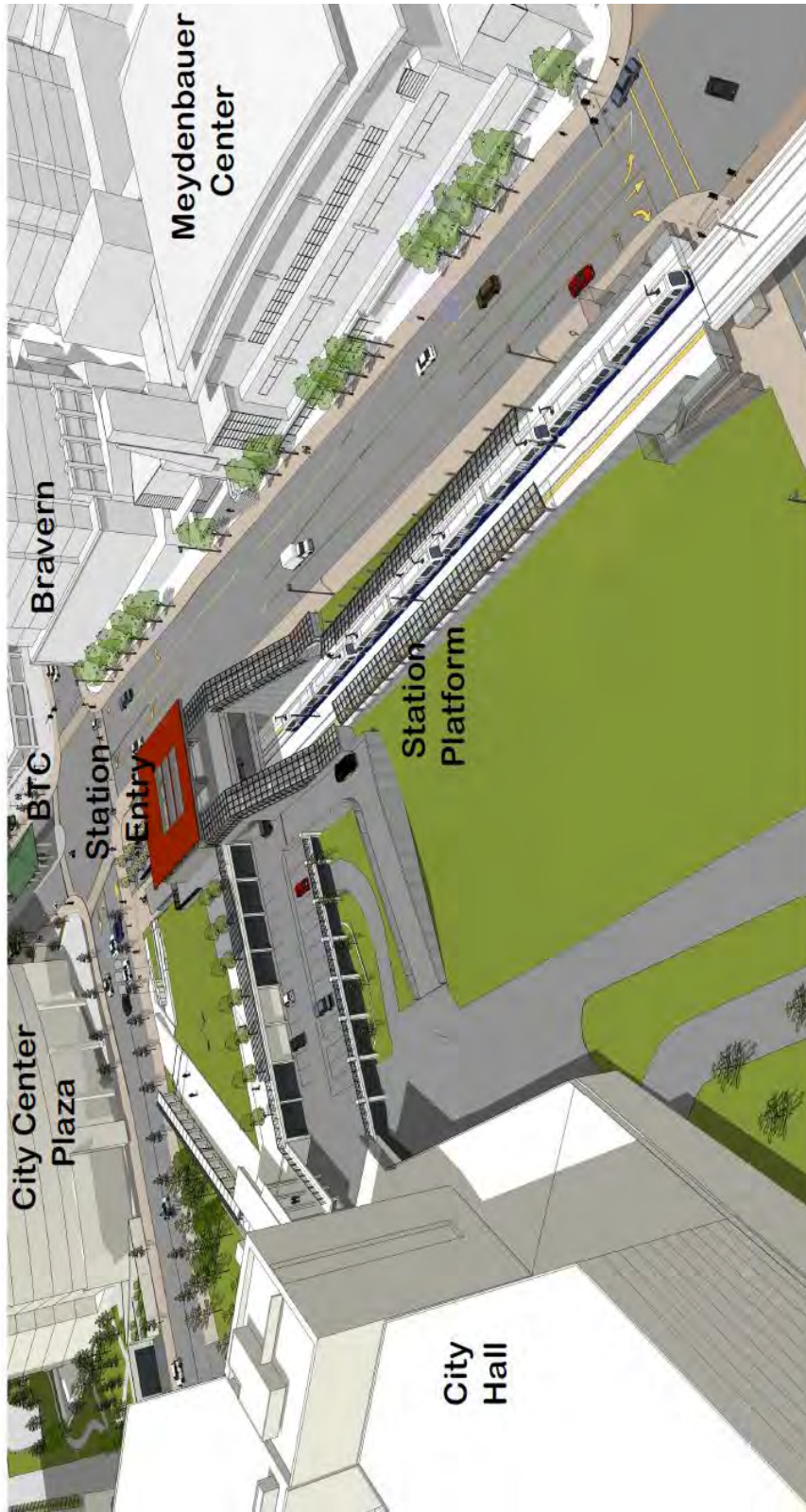


Figure 3.3c.3: Downtown Station Design - Relocate Station to NE 6th - Cost Savings Idea - 3c

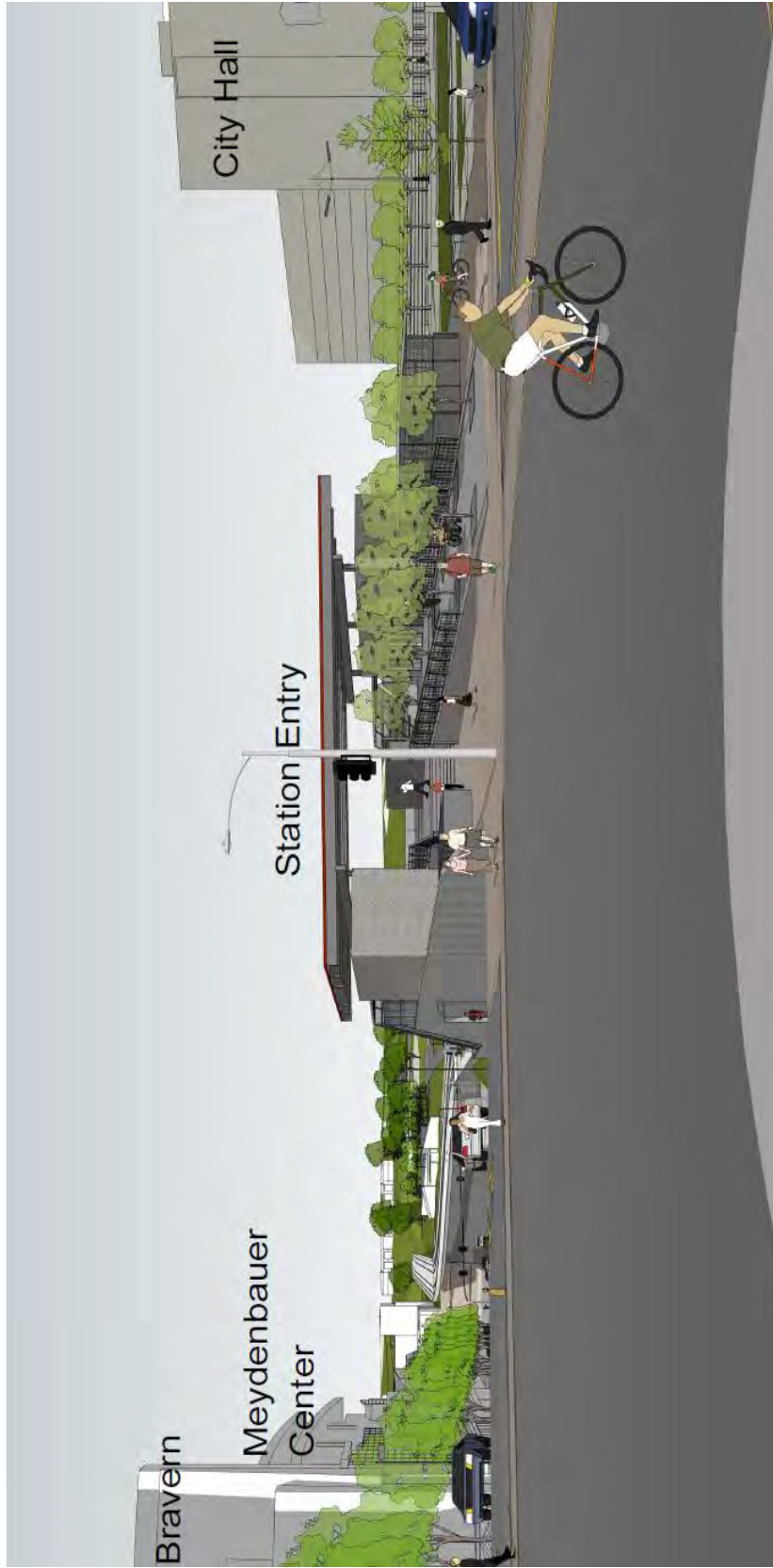


Figure 3.3c.4: Downtown Station Design - Relocate Station to NE 6th - Cost Savings Idea -Street view - 3c

3.3.7 Downtown Station Design - Cost Savings Idea 3e, 3b, 3c- Comparison of Options

Table 3-7

Cost Savings Evaluation: Downtown Station Design – Comparison of Options 3e, 3b, 3c

Description: Downtown Station Design Options				Proposals – 3e, 3b, 3c
	Adopted Project	Optimize Preliminary Engineering 3e	Stacked Tunnel 3b	Relocate Station to NE 6th St 3c
Cost Analysis (2010 \$M)		Range of Savings		
3e 3b 3c		\$ 6 to \$ 10	\$ 8 to \$ 13	\$ 23 to \$ 39
Resource				
LRT Operations	<p>South Portal Operating Speeds – 20mph –curve radius 250 ft.</p> <p>North Portal Operating Speeds – 20 mph. –curve radius 250 ft.</p> <p>I-405 Operating Speeds -35 mph. - curve radius 1500 ft.</p>	<p>Improves LRT operations to 25 mph at the south portal. Curve radius increases to 350 ft.</p> <p>No change in speeds from adopted project at North Portal. Curve radius same as adopted.</p> <p>No change in speeds from adopted project at I-405. Curve radius same as adopted.</p> <p>This option improves LRT operations within the station area.</p> <p>With this option light rail travel times are similar to the adopted project.</p>	<p>No change in speeds from adopted project at South Portal. Curve radius same as adopted.</p> <p>No change in speeds from adopted project at North Portal. Curve radius same as adopted.</p> <p>No change in speeds from adopted project at I-405. Curve radius same as adopted.</p> <p>This option maintains LRT operations within the station area, similar to the Adopted Project.</p> <p>With this option light rail travel times are similar to the adopted project.</p>	<p>Improves LRT operations to 25 mph at the south portal. Curve radius increases to 350 ft.</p> <p>Speeds are reduced at North Portal to 10 mph. Curve radius decreases to 150 ft.</p> <p>Speeds are reduced at I-405 to 20 mph. Curve radius decreases to 300 ft.</p> <p>This option affects LRT operations due to reduced speeds and tighter curves, especially at I-405.</p> <p>Overall increase in light rail travel time from Seattle to Redmond of approximately 30 seconds.</p>

Description: Downtown Station Design Options				Proposals – 3e, 3b, 3c
	Adopted Project	Optimize Preliminary Engineering 3e	Stacked Tunnel 3b	Relocate Station to NE 6 th St 3c
LRT Access and Ridership	6,000 daily boardings at Bellevue Transit Center Station in year 2030. Access to station provided through two entrances.	Same as Adopted Project. Two station entrances with improved access to Downtown and the Bellevue Transit Center with an entrance on the west side of 110 th Ave.	Same as Adopted Project. Two station entrances with improved access to Downtown and the Bellevue Transit Center with an entrance on the west side of 110 th Ave.	Likely lower ridership from single station entrance at NE 6 th Street. Slower LRT travel times may reduce ridership. Access to station provided through one entrance across (east) from Bellevue Transit Center.
Traffic Impacts	Congestion impacts requiring mitigation at NE 4 th St. and 108 th Ave NE.	Similar downtown Bellevue average intersection traffic impacts as Adopted Project.	Similar downtown Bellevue average intersection traffic impacts as Adopted Project.	Same as Adopted Project.

Description: Downtown Station Design Options				Proposals – 3e, 3b, 3c
	Adopted Project	Optimize Preliminary Engineering 3e	Stacked Tunnel 3b	Relocate Station to NE 6 th St 3c
Vehicle Access	<p>Maintains travel lanes on 110th Ave. NE as it exists today.</p> <p>Maintains four travel lanes on NE 6th by widening roadway to the south.</p> <p>Maintains City Hall access on NE 6th St.</p> <p>Eastbound left turn lane at the intersection of 112th Ave. SE and NE 6th St. is removed.</p>	<p>Removes west side lane between NE 6th and City Center Plaza garage due to west station entrance. Four lanes remain, two southbound and two northbound. Removes the dedicated northbound left-turn into the Bellevue Transit Center. A left turn only movement for buses into the Bellevue Transit Center may be considered.</p> <p>No Change from Adopted Project on NE 6th Street.</p> <p>No Change from Adopted Project.</p> <p>No Change from Adopted Project</p>	<p>Removes west side lane between NE 6th and City Center Plaza garage due to west station entrance. Four lanes remain, two southbound and two northbound. Removes the dedicated northbound left-turn into the Bellevue Transit Center. A left turn only movement for buses, only, into the Bellevue Transit Center may be considered.</p> <p>Decreases 110th Ave NE capacity by two traffic lanes –from four to two, south of NE 4th St to NE 3rd St. in order to site the southern station entrance. Northbound left turns from 110th Ave NE to NE 4th will no longer be permitted. Right turn pocket on 110th Ave NE at NE 4th is removed but right turns are permitted.</p> <p>No Change from Adopted Project on NE 6th Street.</p> <p>No Change from Adopted Project.</p> <p>No Change from Adopted Project</p>	<p>Maintains lanes on 110th Ave. NE as it exists today.</p> <p>Existing configuration on NE 6th St. maintained.</p> <p>The business access for City Hall from/to NE 6th is removed in this option.</p> <p>Existing left turn lane at the intersection of 112th Ave SE and NE 6th St is maintained.</p>

Description: Downtown Station Design Options				Proposals – 3e, 3b, 3c
	Adopted Project	Optimize Preliminary Engineering 3e	Stacked Tunnel 3b	Relocate Station to NE 6 th St 3c
Pedestrian Access	Business and residential access maintained. Sidewalk on south side of NE 6 th .	No Change from Adopted Project. Same as the Adopted Project.	No Change from Adopted Project. Same as Adopted Project.	No Change from Adopted Project. The pedestrian access for City Hall from NE 6 th St. is removed. Sidewalk access on NE 6 th maintained in existing configuration.
Approximate Noise Impacts	48 noise impacts at Bravern residences. Impacts could be mitigated with sound insulation.	Same as Adopted Project.	Same as Adopted Project.	Same as Adopted Project. Relocation of station to NE 6 th will add train bell noise at station.
Approximate Vibration Impacts	Vibration: 0 Groundborne noise: 1 There would be groundborne noise impact at the Meydenbauer Center Theatre Impacts can be mitigated with track vibration isolation such as ballast mats or resilient rail fasteners.	Vibration: 0 Groundborne noise: 1 There would be a groundborne noise impact at the Meydenbauer Center Theatre. Impacts can be mitigated with track vibration isolation such as ballast mats or resilient rail fasteners.	Vibration: 0 Groundborne noise: 1 A groundborne noise impact would occur at the Meydenbauer Center Theatre. Impacts can be mitigated with track vibration isolation such as ballast mats or resilient rail fasteners .	Vibration: 0 Groundborne noise: 0
Visual Appearance	No impacts.	Greater visibility due to west station entrance adjacent to Bellevue Transit Center.	Greater visibility due to west station entrance adjacent to Bellevue Transit Center.	Greater visibility due to station entrance across from Bellevue Transit Center.

Description: Downtown Station Design Options				Proposals – 3e, 3b, 3c
	Adopted Project	Optimize Preliminary Engineering 3e	Stacked Tunnel 3b	Relocate Station to NE 6 th St 3c
Approximate Property Impacts	<p>Full: 0 Partial: 2</p> <p>Two partial acquisitions needed for Station entrances. No displacements would occur.</p> <p>Parking stalls at the City Hall Parking Garage would be reduced by approximately 96 spaces.</p>	<p>Same as Adopted Project.</p> <p>Same as Adopted Project.</p>	<p>Full: 0 Partial: 2</p> <p>One partial acquisition needed for Station vents and one partial acquisition needed for Station entrance. No displacements would occur.</p> <p>Parking stalls at the City Hall Parking Garage would be reduced by approximately 88 spaces.</p>	<p>Full: 0 Partial: 2</p> <p>Two partial acquisitions would occur for at-grade station. No displacements would occur.</p> <p>Parking stalls at the City Hall Parking Garage would be reduced by approximately 188 spaces.</p>
Approximate Parkland Impacts	<p>Minor acquisition of Pocket Parks for south station entrance.</p>	<p>Same as adopted project</p>	<p>No use of Pocket Parks would be required for station entrance.</p>	<p>No use of Pocket Parks would be required for station entrance.</p>

Appendix A

Cost Savings Ideas Advanced for Further Engineering Review

(From June 5, 2012 Cost Savings Report)

The concepts listed below are the Cost Savings Ideas that generally will not affect the configuration of the East Link light rail system or its operational impacts on the City and are within the administrative discretion of Project staff from Sound Transit and the City to implement and reduce the City's contingent commitment of \$ 60 million (2010 \$). This list represents those ideas where estimated savings have the potential to be realized with advanced engineering.

Cost Savings Ideas Advanced for Further Engineering Review that Reduce the City's Contingent Commitment

Description	Adopted Project Estimate (2010 \$ M)	Cost Savings Idea Estimate (2010 \$ M)	Potential Cost Savings (2010 \$M)
Elevated Guideway Design			
1. Change Aerial Guideway Super- Structure Type from Pre-Cast Segmental to Precast Girder or Cast-In-Place Box (project-wide, except for SR 520)	\$73	\$67	\$6
2. Change Aerial Guideway Super- Structure Type from Pre-Cast Segmental to Precast Girder or Cast-in-Place Box (SR 520, only)	\$39	\$37	\$2
5. Provide Geotechnical Recommendations to Optimize Structural Elements	\$60	\$52	\$8
Reduce Stormwater Vaults			
1. Replace Drainage Structures with Low-Impact Development Design Elements	\$8	\$6	\$2
Expedite Tunnel Construction through Additional Road Closures			
1. Close 110th Ave. NE to North/South Travel During Construction (Maintain Business/Pedestrian and Emergency Access, only)	\$97	\$84	\$13

Likely savings for the Cost Savings Ideas Advanced for Further Engineering totals \$ 15 million to \$ 20 million (2010 \$). This assumes about half of the total potential savings within this category will be realized, which is reasonable for the current level of design. Actual savings will be determined with additional engineering work that will occur during final design.

Appendix B

Sound Transit and City of Bellevue Cost Savings Work Plan



MOTION NO. M2012-41

A motion of the Board of the Central Puget Sound Regional Transit Authority endorsing the Sound Transit and City of Bellevue Cost Savings Work Plan for the East Link Project attached as Exhibit A.

BACKGROUND:

East Link is a project to expand light rail to East King County via I-90 from downtown Seattle to downtown Bellevue and the Overlake area of Redmond, with stations serving Rainier Avenue/I-90, Mercer Island, south Bellevue, downtown Bellevue, Overlake Hospital, the Bel-Red corridor, Overlake Village and the Overlake Transit Center. Revenue service to the Overlake Transit Center is forecast for 2023.

On November 15, 2011, the City of Bellevue and Sound Transit executed a Memorandum of Understanding (MOU) for the funding and construction of the Board-adopted downtown Bellevue tunnel alignment. Under the MOU, the City and Sound Transit are engaged in a collaborative design process to identify potential modifications for the section of East Link located within the city limits to achieve the shared goals of reducing costs and delivering a high quality project.

In early 2012, Sound Transit and the City generated ideas that could contribute to the goal of reducing project costs. These cost reduction concepts were then assessed by a Peer Review Panel. In April the concepts having the greatest potential to both save costs and meet project objectives were presented to the Sound Transit Board, the Bellevue City Council, and the public at the first of two open houses.

On June 5, 2012 Sound Transit and the City of Bellevue published a Draft Cost Savings Report and held a second public open house. Sound Transit and City staff also provided numerous stakeholder briefings throughout April, May, and June. Through the public involvement process, over 350 comments were received. As a result of public involvement, an additional cost savings concept was developed for 112th Avenue SE.

The Draft Cost Savings Report and public involvement process focused on those ideas which represent a potential change to the project description contained in the MOU between the City and Sound Transit. Sound Transit and the City also identified cost savings ideas which generally will not affect the configuration of the East Link light rail system or its operational impacts and are within the administrative discretion of project staff.

Following consideration of the Draft Cost Savings Report and public comments, the City and Sound Transit, through the MOU's Collaborative Design Process, developed a Cost Savings Work Plan attached as Exhibit A.

The joint work plan identifies cost savings ideas for further development. Advancement of the Cost Savings Work Plan does not constitute a final decision, and in no way alters the East Link Project as approved by the Sound Transit Board and reflected in the Record of Decision issued by the Federal Transit Administration and the Federal Highway Administration. The work plan identifies cost savings ideas for further development and is an indication that the ideas have sufficient merit to continue to invest resources for further review. The next phase of review, including additional engineering design and impact and mitigation analysis consistent with requirements under NEPA and SEPA, will occur in the latter half of 2012 and into 2013.



Exhibit A

Sound Transit and City of Bellevue Cost Savings Work Plan

This joint work plan identifies Cost Savings ideas for further development. It is not a final decision, and in no way alters the East Link Project as approved by the Sound Transit Board and reflected in the Record of Decision issued by the Federal Transit Administration and the Federal Highway Administration, but rather is an indication that the ideas have sufficient merit to continue to invest resources to review. The next phase of review, including additional engineering design and impact and mitigation analysis consistent with requirements under NEPA and SEPA, will occur in the latter half of 2012 and into 2013.

A final decision to incorporate any one or more of these Cost Savings Ideas into East Link would not occur until this additional review is complete; and only after the Sound Transit Board and the City Council determine, in light of the cost savings available and the impacts on the Project and surrounding neighborhoods (including ridership, system impacts, noise, traffic and visual impacts) that these Cost Savings Ideas are consistent with the shared Project goals.

Winters House

Advance for further development options that replace the retained cut by the Winters House with an at-grade light rail alignment.

Design options: If the City Council in July 2012 decides to include a Bellevue Way HOV lane in the City's Transportation Facilities Plan environmental review and continues to make progress towards implementation, then study shifting Bellevue Way west with the cost of the project addressed as set forth in Section 7.2 of the MOU (Idea 1a). If not, then study relocating the Winters House. (Idea 1b)

Other design considerations:

- Noise and visual mitigation for increased length of above grade guideway
- Reduce the added length of elevated guideway
- Optimize the access location for the blueberry farm and Winter's House
- If alternative 1a advances, it should include an HOV lane

Advantages to this approach:

- Lower cost and risk
- Better LRT profile for operations
- Potentially overall reduction in cost and construction impacts for the City and Sound Transit if Bellevue Way HOV lane and LRT construction properly sequenced

112th

Advance for further development an at-grade alignment the length of 112th with a crossing from the east to the west-side at SE 15th below a new road overpass (Idea 2b). No further development of the MOU option of an elevated fly-over at SE 15th and to the extent possible the retained cut at SE 4th.

Design options: Continue to study location for optimal access to the Surrey Downs neighborhood including options from 112th which do not require a gated crossing with bells.

Other Design considerations:

- Work with the community on a package of changes in park use, neighborhood traffic control, other measures to mitigate change in access

- Reduce the height of the reconstructed 112th Ave SE over light rail by depressing light rail tracks to the extent prudent given soil conditions
- Use landscaping to screen the road overpass and LRT
- Noise mitigation for at-grade LRT
- Evaluate pedestrian access to the E. Main Station from the neighborhood and kiss-and-ride access from 112th

Advantages to this approach:

- Responds to Leadership Group criteria for 112th with respect to cost, visual, noise, and avoidance of retained cut
- Lower cost and risk
- Provides grade separated LRT operations

Downtown Station

Advance for further development both a Tunnel Station and the NE 6th Station to refine and better distinguish the difference in potential cost savings.

Design issues to examine with Tunnel Station:

- Optimize configuration to minimize impacts to surface traffic while retaining entrances north and south of NE 4th
- May involve stacked tunnel with one entrance setback from street and mitigation for loss of turn pocket south of NE 4th or further optimization of PE design with mezzanine

Design issues to examine with NE 6th Station:

- Reach agreement on impacts to City Hall and damages payment prior to further design
- Determine acceptability of design deviation (curve at 110th/NE 6th)

Advantages to this approach:

- Allows limited additional time to vet actual cost differences. Relocating the Station to NE 6th should only be advanced further if it has substantially more savings as it has operational and ridership impacts.