East Link Light Rail

Cost Savings Report

(Within City of Bellevue)

June 28, 2012

Prepared for:

SOUNDTRANSIT **and**

CITY OF BELLEVUE WASHINGTON

Prepared by:

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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

ES Executive Summary

ES 1.1 Background

East Link 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 Project 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 Project 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 tunnel and directed staff to review City of Bellevue recommended modifications to the 112th Avenue corridor. The MOU establishes a collaborative framework for Sound Transit and the City to share the additional cost of a tunnel in downtown Bellevue. As such, the MOU establishes a funding commitment by the City for up to $160 million (2010 $), identifies the City's preferred design for the alignment along 112th Ave. SE and commits Sound Transit and Bellevue to review and consider cost-saving design changes.

The City's funding commitment of $160 million (2010 $) for the tunnel comprises an initial contribution of $100 million and a City contingent contribution of $60 million. As a result, the MOU specifies that any Project cost reductions from value engineering, design advancement, scope modifications and any other reason within the City of Bellevue shall count toward 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 substantial negative Project impact on ridership or operations and maintenance).

It is within this framework that the City and Sound Transit have agreed to advance engineering while exploring cost saving concepts and value engineering ideas that may result in material Project cost savings of at least $60 million, while supporting light rail system performance with respect to the East Link Project and City objectives.

In early 2012, Sound Transit Board Members, Bellevue City Council Members and Sound Transit and City staff submitted a wide variety of ideas that could contribute to the goal of reducing Project costs within the city of Bellevue. These cost reduction concepts were then assessed by a Peer Review Panel who contributed their own Cost Savings Ideas. Each of the Cost Savings Ideas were based on the MOU Project Description, which is the route selected by the Sound Transit Board of Directors in July 2011, plus the City-requested design modifications along 112th Ave. SE, as described in the MOU. The Peer review Panel identified concepts reviewed in this report as having the greatest potential to both save costs and meet project objectives.

ES 1.2 Cost Savings Ideas

The City and Sound Transit have classified the Cost Savings Ideas into three categories:

- **Cost Savings Ideas Advanced for Further Engineering Review**

These concepts 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 $). Table ES 1-1 summarizes those ideas and their potential cost savings.

Table ES 1-1
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)
Tunnel Design Optimization			
1. Reduce Tunnel Box Structure Roof by utilizing Load Bearing Center Wall	$16	$13	$3
2. Eliminate Tunnel Waterproofing Membrane System Allowing for Routine Drainage	$2	$0	$2
3. Consolidate Tunnel Wall Configuration with a Single Slurry Wall	Upon Further Analysis, No Savings		
4. Eliminate Portal Fans by Upsizing Station Fans	Upon Further Analysis, No Savings		
Tunnel Station Design Optimization			
1. Reduce Mezzanine and Platform Size	$40	$37	$3
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 Steel	Upon Further Analysis, No Savings		
3. Change Aerial Guideway Super- Structure Type from Pre-Cast Segmental to Precast Girder or Cast-in-Place Box (SR 520, only)	$39	$37	$2
4. Change Aerial Guideway Super-Structure Type from Pre-Cast Segmental along SR	Upon Further Analysis, No Savings		

Description	Adopted Project Estimate (2010 $ M)	Cost Savings Idea Estimate (2010 $ M)	Potential Cost Savings (2010 $M)
520 to Retained Fill			
5. Provide Geotechnical Recommendations to Optimize Structural Elements	$60	$52	$8
Optimize 120th St. Station Design			
1. Replace Vertical Walls (Trench) with Sloped Walls	Upon Further Analysis, No Savings		
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 that May be Advanced for Further Engineering totals $20 million to $24 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**.**

Alternative tunnel construction staging areas were previously identified as potential cost savings and were advanced for further engineering review. While it would not reduce the City's contingent commitment of $60 million (2010 $), it may have other benefits for the project and the City. The City and Sound Transit will continue to explore this concept.

- **Cost Savings Ideas that May Affect the MOU Project Description**

These concepts change either the configuration of the East Link Project or its operational impacts on the City and may require a change to the MOU Project Description. These ideas and their potential cost savings are shown in Table ES 1-2.

Table ES 1-2
Cost Savings Ideas That May Affect the MOU Project Description

Description	Adopted Project Estimate * (2010 $ M)	Cost Savings Idea Estimate (2010 $ M)	Range of Savings (2010 $ M)
1. Bellevue Way Alignment at Winters House			
a. Shift Bellevue Way West to Allow Space for At-Grade LRT in Front of Winters House	$22	$13	$6 to $10
b. Relocate Winters House, At-Grade Alignment	$19	$13	$4 to $7
2. 112th Ave. SE Alignment at Surrey Downs Park			
a. At-grade, Closing SE 4th Street While Extending SE 8th into Surrey Downs to Provide New Neighborhood Access	$57	$50	$5 to $9
3. Downtown Station Design			
a. Eliminate Mezzanine, Station Entrance in Outer Lane of 110th Ave. (Allows Station and Tunnel to Be Shallower)	$70	$64	$4 to $7
b. Construct A Stacked Tunnel Configuration With Entrances in the Outer Lane of 110th Ave. (Allows Tunnel to Be Narrower)	$149	$138	$8 to $13
c. Relocate Station to NE 6th (Parallel)	$188	$173	$10 to $18
d. Relocate Station to the City Hall/Metro Site (Diagonal)	$188	$168	$14 to $23
4. Downtown Tunnel Design			
a. Retained Cut From Main St. to NE 2nd St.	Upon Further Analysis, No Savings		
5. NE 16th St. Cross-Section			
a. Build Two-Way Road on North-Side of Light Rail Alignment	Upon Further Analysis, No Savings		
b. Alternative Configuration of NE 16th St.	Upon Further Analysis, No Savings		

* Adopted Project Estimates differ because each Cost Savings Idea affects a different portion of the project.

Due to the conceptual nature of the design for these concepts, potential cost savings are presented in a range of savings. A range of minus 30 percent to plus 20 percent was applied to create this range.

As part of this process, the Cost Savings Ideas were subjected to further engineering analysis (to a 5% engineering level of design); a review of the concept's cost estimate and an environmental screening to determine each concept's:

- Technical feasibility;
- Potential cost reduction;
- Potential environmental impact, if any; and

- Other considerations identified by the public at an open house on April 26, 2012, correspondence received by Sound Transit and the City and in stakeholder briefings.

The following tables described each location/category of cost savings and the applicable Cost Savings Idea and how it compares to the Adopted Project.

Table ES 1-3
Bellevue Way Alignment at Winters House – 1a and 1b

	Adopted Project LRT in Trench	**Cost Savings Idea Shift Bellevue Way 1a**	**Cost Savings Idea Relocate Winters House 1b**
Cost Analysis (2010 $ M)	$22 (1a) $19 (1b)	$6-10 Range of Savings	$4-7 Range of Savings
Environmental Screening Results: By Resource (Potential Impacts)			
LRT Operations	Vertical alignment geometry near maximum allowable design criteria.	Vertical alignment geometry below 4% and within desirable range. Improves LRT Operations.	Vertical alignment geometry below 4% and within desirable range. Improves LRT Operations.
LRT Access and Ridership	N/A	N/A	N/A
Traffic (Mobility)			
• Traffic Impacts	N/A	N/A	N/A
• Vehicle Access	Blueberry Farm access is rerouted and combined with access to the Winters House.	Winters House access is re-routed and combined with existing access at the Blueberry Farm. Closure of secondary residential driveway – primary access remaining.	Winters House access is re-routed and combined with existing access at the Blueberry Farm.
• Pedestrian Access	Winters House access unchanged. Blueberry Farm access is rerouted and combined with Winters House access.	Same as Adopted Project. Sidewalk access is retained.	Winters House access is re-routed and combined with access to Blueberry Farm at existing driveway. New north access also provided to Winters House at 112th and Bellevue Way.

Table ES 1-3
Bellevue Way Alignment at Winters House – 1a and 1b

	Adopted Project LRT in Trench	**Cost Savings Idea Shift Bellevue Way 1a**	**Cost Savings Idea Relocate Winters House 1b**
Noise and Vibration	Moderate noise impacts on west side of Bellevue Way SE south of Winters House, mitigated with sound walls and building sound insulation. Potential for vibration/groundborne noise impact at Winters House that can be mitigated with special trackwork.	Increased light rail and traffic noise on west side of Bellevue Way SE from at-grade profile and shifting traffic closer to residences, mitigated with sound walls and building sound insulation. Reduced potential for vibration at Winters House. Groundborne noise impact eliminated.	Increased light rail noise exposure on west side of Bellevue Way SE from at-grade profile, mitigated with sound walls and building sound insulation. Reduced potential for vibration at Winters House. Groundborne noise impact eliminated.
Visual Appearance	Lidded trench in front of Winters House. No changes west of Bellevue Way SE.	Light rail more visible from extended aerial guideway north from the existing park and ride as well as from the at-grade profile in front of Winters House; loss of vegetation and a retaining wall on west side of Bellevue Way SE.	Light rail more visible from extended aerial guideway north from the existing park and ride as well as from the at-grade profile in front of Winters House.
Other Environmental Elements Affected by the Proposed Change			
• Property Impacts	One residential displacement.	Additional three residential displacements and several partial acquisitions west of Bellevue Way SE.	Same as Adopted Project.
• Wetlands	Wetland and buffer impacts east of Bellevue Way SE.	Similar impacts south of Winters House, less impact north of house.	Additional wetland impacts, depending on Winters House relocation site.

Table ES 1-3
Bellevue Way Alignment at Winters House – 1a and 1b

	Adopted Project LRT in Trench	**Cost Savings Idea Shift Bellevue Way 1a**	**Cost Savings Idea Relocate Winters House 1b**
• Parklands	Light rail located within west edge of Mercer Slough Nature Park. The Blueberry Farm retail is relocated near the Winters House with a combined driveway.	Similar impacts south of Winters House, slightly less impacts north of house. Parking access is changed to existing Blueberry Farm.	Similar to Adopted Project, except Winters House relocated elsewhere in the park. Parking access is changed to existing Blueberry Farm.
• 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.	Winters House relocated elsewhere in Mercer Slough Nature Park, potential for damage during relocation.
Schedule Risk	N/A	Moderate – will likely require simplified Section 106 MOA with Federal Transit Administration and Department of Archaeology and Historic Preservation.	Higher - requires modifications to Section 106 MOA with FTA and DAHP.

Table ES 1-4
112th Ave. SE Alignment at Surrey Downs Park – 2a

	MOU Recommendation **112th Ave. SE Alignment at Surrey Downs Park**	**Cost Savings Idea** **At-grade, rather than Retained Cut Section 2a**
Cost Analysis (2010 $ M)	$57	$5 -$9 Range of Savings
Environmental Screening Results: By Resource (Potential Impacts)		
LRT Operations	Complex vertical alignment with multiple grade changes and close vertical curves.	Relatively flat vertical alignment geometry, with minimal grades and long vertical tangents creating better rider comfort.
LRT Access and Ridership	N/A	N/A
Traffic (Mobility)		
• Traffic Impacts	Intersections along 112th Ave. SE operate acceptably.	Intersection impacts at SE 8th St. and 112th Ave SE. due to extension of SE 8th St. and new traffic light.
• Vehicle Access	SE 4th St. to 112th Ave. SE remains open. SE 8th St. to 112th Ave. SE remains a "T" intersection. Surrey Down Park access closed from 112th Ave. SE.	Provides neighborhood access by extending SE 8th St. west to 111th Ave. SE. while closing SE 4th St. connection to 112th Ave. SE. Closes access to Surrey Downs Park from 112th Ave.SE providing access from either or both SE 4th or SE 8th/111th Ave SE.
• Pedestrian Access	SE 4th St. to 112th Ave. SE remains open. Surrey Downs Park access closed from 112th Ave. SE. Sidewalk provided along 112th Ave. SE.	SE 4th St. closed. SE 8th St. open to Surrey Downs Neighborhood. Surrey Down Parks access closed from 112th Ave. SE. Sidewalk provided along 112th Ave. SE.
Noise and Vibration	Moderate and severe noise impacts west of 112th Ave. SE, mitigated with sound walls, building sound insulation and special trackwork. A few vibration impacts on west side of 112th Ave. SE near SE 8th St. that can be mitigated.	Increased light rail and traffic noise from longer and higher elevated section, at-grade section, and extended SE 8th St., mitigated with sound walls, building sound insulation and special trackwork. Similar vibration impacts to MOU project mitigated with special trackwork.

Table ES 1-4
112th Ave. SE Alignment at Surrey Downs Park – 2a

	MOU Recommendation **112th Ave. SE Alignment at Surrey Downs Park**	**Cost Savings Idea** **At-grade, rather than Retained Cut Section 2a**
Visual Appearance	Elevated section and straddle bent over 112th Ave. SE. Retained cut with high retaining walls in Surrey Downs Park.	Greater visibility from longer and higher elevated section and at-grade section. Reduces height of retaining wall along Surrey Downs Park. New SE 8th St. access creates different views in the area.
Other Environmental Elements Affected by the Proposed Change		
• Property Impacts	Multiple partial and 16 full acquisitions on west side of 112th Ave. SE.	Additional 3 residential displacements on west side of 112th Ave. SE. due to SE 8th St. extension.
• Parklands	No direct access to park from 112th Ave. SE: replaced with new access from SE 4th St., and parkland acquisition for retained cut on east side of park.	No access to park from 112th Ave. SE: Park access replaced with new access from within Surrey Downs neighborhood from SE 4th St. or 111th Ave. SE. Similar parkland acquisition.
Schedule Risk	Moderate - potential for additional Federal review with changes to Surrey Downs Park.	Same as MOU Recommendation.

Table ES 1-5
Downtown Station Design –3a thru 3d

	Adopted Project	**Cost Savings Idea Eliminate Mezzanine 3a**	**Cost Savings Idea Stacked Tunnel 3b**	**Cost Savings Idea Relocate Station to NE 6th St (Parallel) 3c**	**Cost Savings Idea Relocate Station to City Hall/Metro Site (Diagonal) 3d**
Range of Savings for Cost Savings Ideas					
Cost Analysis (2010 $M)	$70(3a) $149(3b) $188(3c) $188(3d)	$4-$7	$8-$13	$10-$18	$14-$23
Environmental Screening Results; By Resource (Potential Impacts)					
LRT Operations	Horizontal and vertical alignment design requires 20 MPH operations due to geometry.	Same as Adopted Project.	Same as Adopted Project.	Horizontal and vertical alignment design requires 10 MPH operations due to horizontal radius near 150'. This will require an approval of a design deviation by Sound Transit.	Horizontal and vertical alignment design requires 10 MPH operations due to horizontal radius near 150'. This will require an approval of a design deviation by Sound Transit.

Table ES 1-5
Downtown Station Design –3a thru 3d

	Adopted Project	**Cost Savings Idea Eliminate Mezzanine 3a**	**Cost Savings Idea Stacked Tunnel 3b**	**Cost Savings Idea Relocate Station to NE 6th St (Parallel) 3c**	**Cost Savings Idea Relocate Station to City Hall/Metro Site (Diagonal) 3d**
LRT Access and Ridership	6,000 daily boardings at Bellevue Transit Center Station in year 2030. Access to station provided through two entrances.	Slight increase in ridership due to less vertical walking distance for patrons. Access to station provided through two entrances on east side of 110th Ave. NE; north and south of NE 4th St.	Same as Adopted Project. Access to station provided through two entrances on east side of 110th Ave. NE; north and south of NE 4th St.	Slightly lower ridership from single station entrance. One station access at NE 6th St.	Slightly lower ridership from single station entrance. One station access at NE 6th St.
Jobs Within 5 Minute Walk Radius Residents Within 5 Minute Walk Radius	36% 14%	44% 19%	38% 14%	33% 4%	33% 7%
Traffic (Mobility)					
• Traffic Impacts	Congestion impacts requiring mitigation at NE 4th St. and 108th Ave NE.	Up to 5% increase in congestion in downtown Bellevue and southeast area of downtown from reduced travel lanes on 110th Ave. NE.	Up to 5% increase in congestion in downtown Bellevue and southeast area of downtown from reduced travel lanes on 110th Ave. NE.	Same as Adopted Project.	Same as Adopted Project. Relocates City Hall parking garage.

Table ES 1-5
Downtown Station Design –3a thru 3d

	Adopted Project	Cost Savings Idea Eliminate Mezzanine 3a	Cost Savings Idea Stacked Tunnel 3b	Cost Savings Idea Relocate Station to NE 6th St (Parallel) 3c	Cost Savings Idea Relocate Station to City Hall/Metro Site (Diagonal) 3d
• Vehicle Access	Maintains four travel lanes on 110th Ave. NE.	Reduces travel lanes on 110th Ave. NE to two thru lanes –one each – north- and Southbound. Maintains turning lanes at intersections. City Hall 110th Ave. NE driveway removed.	Allows three lanes on 110th Ave. NE. Eliminates one lane. City Hall/110th Ave. NE driveway removed.	Maintains 4 lanes on 110th Ave.NE. Maintains 5 lanes on NE 6th. NE 6th St/City hall access removed. Limits access to future development on Metro Site.	Maintains four lanes on 110th Ave. NE. Maintains five lanes on NE 6th St. NE 6th St. City hall parking garage removed. Limits access to future development on Metro Site.
• Pedestrian Access	Business and residential access maintained.	Same as Adopted Project.	Same as Adopted Project.	Same as Adopted Project. May affect access to Metro Site.	Same as Adopted Project. May affect access to Metro Site
Noise and Vibration	Moderate noise and groundborne noise impacts from elevated guideway on NE 6th St. that can be mitigated. No vibration impacts.	Increased vibration and groundborne noise from shallower tunnel that could be mitigated.	Increased vibration and groundborne noise from reconfigured tunnel that could be mitigated.	Added bell noise from above-grade station, mitigated with building sound insulation. Increased groundborne vibration from reconfigured tunnel that could be mitigated.	Added bell noise from at-grade station, mitigated with building sound insulation. Increased vibration and groundborne noise to Bellevue City Hall from reconfigured tunnel that could be mitigated.

Table ES 1-5
Downtown Station Design –3a thru 3d

	Adopted Project	**Cost Savings Idea Eliminate Mezzanine 3a**	**Cost Savings Idea Stacked Tunnel 3b**	**Cost Savings Idea Relocate Station to NE 6th St (Parallel) 3c**	**Cost Savings Idea Relocate Station to City Hall/Metro Site (Diagonal) 3d**
Visual Appearance	No impacts.	Same as Adopted Project.	Same as Adopted Project.	Greater visibility of station.	Greater visibility of station and removal of parking garage structure.
Other Environmental Elements Affected by the Proposed Change					
• Property Impacts	Minor acquisition for station entrances.	Less property acquisition for relocated station entrances.	Less property acquisition for relocated station entrances.	Increased property acquisition including King County Metro Site and Bellevue City Hall parking garage.	Increased property acquisition including King County Metro Site and Bellevue City Hall parking garage and police facilities.
• Parklands	Minor acquisition of Pocket Parks for south station entrance.	Minor acquisitions of Pocket Parks for tunnel fans and vents.	Minor acquisitions of Pocket Parks for tunnel fans and vents.	No impact due to relocated station.	No impact due to relocated station.
Schedule Risk	N/A	Lower.	Lower.	Lower.	Lower.

Table ES 1-6
Downtown Tunnel Design – 4a

	Adopted Project	**Cost Savings Idea Retained Cut/ Main Street to NE 2nd St 4a**
Cost Savings Potential (2010$ M)	Upon Further Analysis, No Savings	
Environmental Screening Results; By Resource (Potential Impacts)		
LRT Operations	Horizontal and vertical alignment design requires 20 mph operations due to geometry.	Same as Adopted Project.
LRT Access and Ridership	N/A	N/A
Traffic (Mobility)		
• Traffic Impacts	Congestion requiring mitigation at NE 4tth St. and 108th Ave NE in downtown Bellevue.	Same as Adopted Project.
• Vehicle Access	Maintains current 110th Ave. NE access and roadway intersection configurations.	Widen 110th Ave. NE between Main St. and NE 2nd St. to accommodate retained cut opening and wider travel lanes required for emergency vehicle access. Right in – right out driveway access restriction between Main St. and NE 2nd St. Requires non-standard signalized intersection at Main St. and 110th Ave. NE.
• Pedestrian Access	Maintains current 110th Ave. NE sidewalk access.	Maintains current 110th Ave. NE sidewalk access.
Noise and Vibration	No impacts.	Increased noise from retained cut alignment to apartments on the east side of 110th Ave. NE, may be mitigated by using absorbent material on retained cut walls.
Visual Appearance	No impacts	Greater visibility from retained cut alignment.
Other Environmental Elements Affected by the Proposed Change		

Table ES 1-6
Downtown Tunnel Design – 4a

	Adopted Project	**Cost Savings Idea Retained Cut/ Main Street to NE 2nd St 4a**
• Property Impacts	Property acquisitions related to tunnel.	New property acquisitions from larger footprint.
Schedule Risk	N/A	Lower.

Table ES 1-7
NE 16th St. Cross-Section – 5a and 5b

	Adopted Project	**Cost Savings Idea Build 2-way Road NE 16th St. North Side of LRT 5a**	**Cost Savings Idea Alternative Configuration/NE 16th St. 5b**
Cost Savings Potential (2010 $ M)	Upon Further Analysis, No Savings		
Environmental Screening Results; By Resource (Potential Impacts)			
LRT Operations	Complex but within design criteria manual horizontal and vertical geometry.	Minimal to no change.	Minimal to no change.
LRT Access and Ridership	N/A	N/A	N/A
Traffic (Mobility)			
• Traffic Impacts	Intersections operate acceptably along NE 16th St. and 136th Place NE.	Worse intersection operations and safety considerations at NE 16th St./136th Place NE intersection.	Improvement over Adopted Project due to more opportunities for fuller street grid.
• Vehicle Access	North roadway at a higher level than light rail and south roadway. Right in, right out on each side of LRT alignment.	Roadway/light rail on one level - Restricted access to properties on the south side – improves access for properties north of the alignment.	Roadway and light rail on one level. Right-in, right-out on each side of LRT alignment. Provides access to properties on both sides.

Table ES 1-7
NE 16th St. Cross-Section – 5a and 5b

	Adopted Project	**Cost Savings Idea Build 2-way Road NE 16th St. North Side of LRT** **5a**	**Cost Savings Idea Alternative Configuration/NE 16th St.** **5b**
• Pedestrian Access	Full access provided to adjacent properties on both sides of NE 16th St..	Same as Adopted Project.	Improvement over adopted project due to more opportunities for a fuller pedestrian network.
Noise and Vibration	No impacts.	Increased traffic noise from changed roadway configuration that could be mitigated	Same as Adopted Project.
Visual Appearance	At-grade section in center of traffic lanes with north traffic lanes higher than the southern lanes.	At-grade section on south side of two-way traffic lanes.	LRT and traffic lanes are all at the same level.
Other Environmental Elements Affected by the Proposed Change			
• Property Impacts	Multiple partial acquisitions along NE 16th St. between 132nd Ave. NE and 136th Place NE.	One likely additional business displacement. Reduced level of acquisitions from narrower light rail and road right-of-way.	Same as Adopted Project.
Schedule Risk	N/A	Lower.	Lower.

- **Cost Savings Ideas - Previously Reviewed and Not Selected**

These concepts were previously evaluated during the five-year East Link environmental review process and not selected for inclusion in the Project to be built. While the ideas in Table ES 1- 9 may have the potential to reduce cost, no further technical analysis is being conducted as they have already been considered.

Table ES 1-8
Cost Savings Ideas Reviewed But Not Selected

Description
1. South Bellevue Way Alignment
a. Utilize Bellevue HOV Ramps to Exit I-90
b. At-Grade Center Running Alignment on Bellevue Way and 112th Ave. SE.
2. 112th Ave. SE Design Modifications
a. At-Grade Crossing of SE 15th St.

While this report summarizes the entire Cost Savings exercise to date, it focuses on the Cost Savings Ideas that may affect the MOU and presents the results of the early engineering and environmental analysis so that direction can be received from Bellevue City Council and the Sound Transit Board as to whether to identify these ideas for further analysis.

ES 1.3 Public Involvement

On April 26, 2012, Sound Transit and the City co-hosted the first of two public open houses to introduce Cost Savings Ideas and provide an opportunity for public review and comment. The open house was held from 4:00 to 7:00 p.m. at Bellevue City Hall. Over 200 people attended the open house to learn about the Cost Savings Ideas and provide feedback. Bellevue Councilmembers and Sound Transit Board Members also attended the open house. Comments and input received included:

- General support for cost-savings measures
- Concern for noise and visual impacts
- Opposition to additional property acquisitions
- Concern for increased cut-through traffic in the Surrey Downs neighborhood
- Preference for a grade-separated alignment on 112th Ave SE
- Concern for environmental effects
- Support for easy access to light rail stations
- General support for the downtown station ideas

Community members were asked to sign in upon arrival and received an East Link Project folio and comment form. Staff ambassadors greeted participants and explained the cost savings process and ideas under consideration. Technical staff reviewed the ideas and invited participants to note their comments directly on design plans or comment forms provided. In addition to the ideas with potential changes to the MOU Project Description, ideas for further engineering review and ideas previously reviewed and not selected were also shared. Staff collected approximately 160 comments at the first open house. All comments from the Cost Savings Open House #1, stakeholder briefings, correspondence and Cost Savings Open House #2 (June 5, 2012) will be compiled and shared with the Sound Transit Board and Bellevue City Council and made available to the public on the project website.

Sound Transit and the City are working together to attend stakeholder briefings throughout May, June, and July; and respond to correspondence. They are preparing for a Cost Savings Open House # 2 on Tuesday, June 5, 2012 from 4 to 7 pm at Bellevue City Hall. The purpose of the second open house is to present the information provided in this report.

ES 1.4 Next Steps

Cost savings ideas categorized as ideas that "impact the MOU Project Description," would, if ultimately determined to be ideas that should be incorporated into East Link, require approval by both agencies; by the Sound Transit Board as modifications to the approved Project , and by the City Council as modifications to the Project described in the MOU. Before either agency can take that action, additional engineering work and environmental review is necessary to identify impacts and mitigation consistent with the standards applicable to East Link. This additional engineering and environmental work requires time and resources, and would occur as design of the Project moves forward into 2012 and 2013.

In order to ensure that this dedication of time and resources has the support of both agencies, the Sound Transit Board and Bellevue City Council will be asked in June to endorse moving forward for further feasibility analysis only those Cost Savings Ideas that the agencies believe could be incorporated into East Link and support the agencies' commitment to deliver a high-quality, well-integrated Project which serves the region. This June endorsement 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 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 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.

The entire Cost Savings Report and open house graphics can be found at www.soundtransit.org/eastlink

1.0 Introduction to the Cost Savings Process

East Link is Sound Transit's voter-approved project to build approximately 14 miles of light rail that will stretch from Seattle, cross Lake Washington via I-90, serving Mercer Island, Bellevue and Redmond's Overlake area. The East Link Project 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 Project 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 tunnel and directed staff to review City of Bellevue recommended modifications to the 112th Avenue corridor. The MOU establishes a collaborative framework for Sound Transit and the City to share the additional cost of a tunnel in downtown Bellevue. As such, the MOU establishes a funding commitment by the City for up to $160 million (2010 $), identifies the City's preferred design for the alignment along 112th Ave. SE and commits Sound Transit and Bellevue to review and consider cost-saving design changes. Other key elements of the agreement include mechanisms to share risks and benefits between the parties and commitments to work collaboratively in the final design process to manage the Project's scope, schedule and budget.

The City's funding commitment of $160 million (2010 $) for the tunnel comprises an initial contribution of $100 million and a City Contingent Contribution of $60 million. The City's initial commitment of $100 million is provided through $83.6 million in credits toward real property components of the Project; the remaining $16.4 million will fund specific Project elements through various sources and credits.

The City's Contingent Contribution of up to $60 million will be adjusted to the Project Baseline Budget, and the final amount will be determined at Project Close-out. Furthermore, if the cost of the Project included in the 60% updated Project Cost Estimate, which is based on the elements in the MOU Baseline, is lower than the MOU Baseline, then the City Contingent Contribution will be permanently adjusted downward by an equal amount, up to a total reduction of $60 million (2010 $). The final amount of City Contingent Contribution to be paid will be based on the actual expenditures required for the portal-to-portal costs during the tunnel construction and will reconciled at Project Close-out.

The MOU specifies that the Project cost reductions from value engineering, design advancement, scope modifications and any other reason within the City of Bellevue shall count towards the reduction of City Contingency (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 substantial negative Project impact on ridership or operations and maintenance).

It is within this framework that the City of Bellevue and Sound Transit have agreed to advance engineering while exploring cost savings concepts and value engineering ideas that may 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.

In early-2012, Sound Transit Board Members, Bellevue City Council Members and Sound Transit and City staff submitted a wide variety of ideas that could contribute to the goal of reducing Project costs within

the city of Bellevue. Each of the Cost Savings Ideas were based on the MOU Project Description, which is the route selected by the Sound Transit Board of Directors in July 2011, plus the City-requested design modifications along 112th Ave. SE as described in the MOU. The Peer review Panel identified concepts reviewed in this report as having the greatest potential to both save costs and meet project objectives.

These cost reduction concepts were then assessed by a Peer Review Panel who contributed their own Cost Savings Ideas and considered the following criteria:

- Potential for cost-savings
- Light rail operations: speed, reliability
- Light rail station access and ridership
- Traffic mobility
- Potential noise and vibration impacts
- Visual appearance
- Other potential environmental elements: property acquisition, parks, wetlands, historic resources
- Potential for schedule risk

The Peer Review Panel recommended to Sound Transit and the City that the ideas contained in this Cost Savings Summary Report should further be assessed for potential incorporation into the East Link Project.

1.1 This Report

The City and Sound Transit have classified the Cost Savings Ideas into three categories:

- **Cost Savings Ideas Advanced for Further Engineering Review**

  These concepts 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.

- **Cost Savings Ideas that May Affect the MOU Project Description**

  These concepts change either the configuration of the East Link Project or its operational impacts on the City and may require a change to the MOU Project Description.

- **Cost Savings Ideas - Previously Reviewed and Not Selected**

  These concepts were previously evaluated during the five-year East Link environmental review process and not selected for inclusion in the Project to be built. While they may have the potential to reduce cost, no further technical analysis is being conducted as they have already been considered.

The Cost Savings Ideas were subjected to further engineering analysis (to a 5% engineering design level); a review of the concept's cost estimate and an environmental screening to determine each concept's:

- Technical feasibility,
- Potential cost reduction,
- Potential environmental impact, if any, and

- Other considerations identified by the public at an open house on April 26, 2012, correspondence received by Sound transit and the City, and in stakeholder briefings

While this report summarizes the entire Cost Savings exercise to date, it focuses on the Cost Savings Ideas (presented in 2010 $) with potential changes to the MOU that require review by the Bellevue City Council and direction from the Sound Transit Board as to whether to identify these ideas for further analysis.

1.2 Cost Estimating Methodology

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 project, an accuracy range of minus 30 percent (-30%) to plus 20 percent (+20%) was applied to the estimated cost savings (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 takes into consideration the conceptual nature of the Cost Savings Ideas. It is to be noted that while anticipated environmental impacts were qualitatively assessed, no cost estimate of changes to the environmental mitigation was performed at this time. All estimated costs are in 2010 dollars.

2.0 Cost Savings Ideas Advanced for Further Engineering Review

Table 2-1 lists the Cost Savings Ideas that do not change the MOU description of the Project but have the opportunity to provide cost savings and to contribute to the overall goal of reducing costs of the Project within the city of Bellevue. These ideas 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 (2012 $). Concepts under review were developed to an approximate 5% engineering level.

Table 2-1
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)
Tunnel Design Optimization			
1. Reduce Tunnel Box Structure Roof by Utilizing Load Bearing Center Wall	$16	$13	$3
2. Eliminate Tunnel Waterproofing Membrane System Allowing for Routine Drainage	$2	$0	$2
3. Consolidate Tunnel Wall Configuration with a Single Slurry Wall	Upon Further Analysis, No Savings		
4. Eliminate Portal Fans by Upsizing Station Fans	Upon Further Analysis, No Savings		
Tunnel Station Design Optimization			
1. Reduce Mezzanine and Platform Size	$40	$37	$3
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 Steel	Upon Further Analysis, No Savings		
3. Change Aerial Guideway Super- Structure Type from Pre-Cast Segmental to Precast Girder or Cast-in-Place Box (SR 520, only)	$39	$37	$2
4. Change Aerial Guideway Super-Structure Type from Pre-Cast Segmental along SR 520 to Retained Fill	Upon Further Analysis, No Savings		
5. Provide Geotechnical Recommendations to Optimize Structural Elements	$60	$52	$8

Description	Adopted Project Estimate (2010 $ M)	Cost Savings Idea Estimate (2010 $ M)	Potential Cost Savings (2010 $M)
Optimize 120th St. Station Design			
1. Replace Vertical Walls (Trench) with Sloped Walls	Upon Further Analysis, No Savings		
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 that May be Advanced for Further Engineering totals $20 million to $24 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**.**

Alternative tunnel construction staging areas were previously identified as potential cost savings and were advanced for further engineering review. While it would not reduce the City's contingent commitment of $60 million (2010 $), it may have other benefits for the project and the City. The City and Sound Transit will continue to explore this concept.

3.0 Cost Savings Ideas that Affect the MOU Project Description

These concepts change either the configuration of the East Link Project or its operational impacts on the City and may require a change to the MOU Project Description. Figure 3.0.0 identifies the locations of the Cost Savings Ideas that may affect the MOU Project Description.

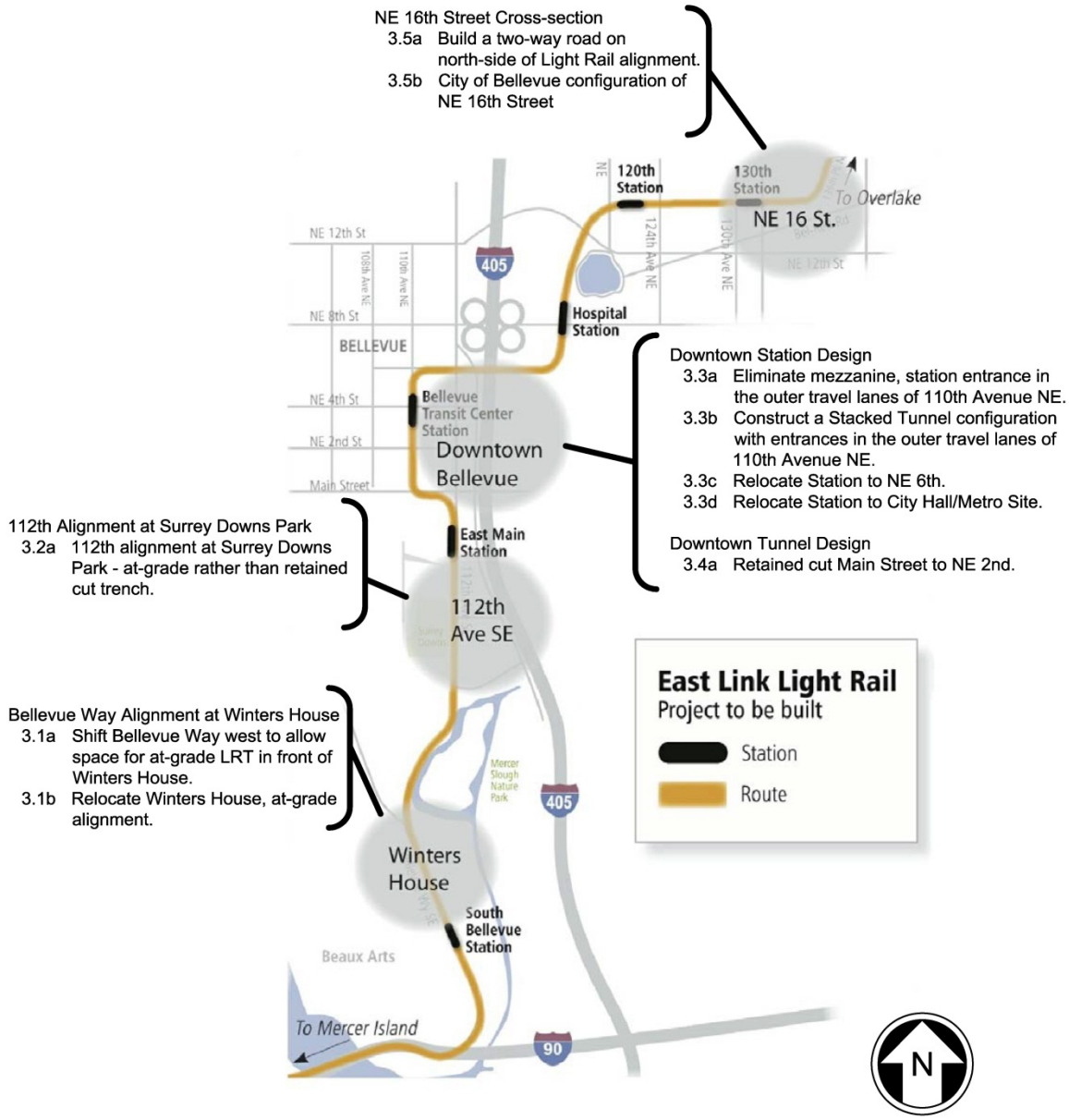


Figure 3.0.0:
Cost Savings Ideas That May Affect the MOU Project Description

Table 3-1
Cost Savings Ideas That Affect the MOU Project Description

Description
1. Bellevue Way Alignment at Winters House
a. Shift Bellevue Way West to Allow Space for At-Grade LRT in Front of Winters House
b. Relocate Winters House, At-Grade Alignment
2. 112th Ave. SE Alignment at Surrey Downs Park
a. At-grade, Closing SE 4th St. While Extending SE 8th St. Into Surrey Downs to Provide New Neighborhood Access
3. Downtown Station Design
a. Eliminate Mezzanine, Station Entrance in Outer Lane of 110th Ave. (Allows Station and Tunnel to Be Shallower)
b. Construct A Stacked Tunnel Configuration With Entrances in the Outer Lane of 110th Ave. (Allows Tunnel to Be Narrower)
c. Relocate Station to NE 6th (Parallel)
d. Relocate Station to the City Hall/Metro Site (Diagonal)
4. Downtown Tunnel Design
a. Retained Cut from Main St. to NE 2nd St.
5. NE 16th St. Cross-Section
a. Build Two-Way Road On North-Side of Light Rail Alignment at NE 16th St.
b. Alternative Configuration of NE 16th St.

Sections 3.1 through 3.5 contain comparisons of the "Adopted Project or MOU Recommendation" to the "Cost Savings Idea" using the following information:

- An overall map showing the location of the of the Cost Savings Idea within the East Link alignment;
- A Cost Savings Evaluation Worksheet – containing a narrative description, cost analysis and environmental review process (as described below); and
- A series of graphics depicting the "Adopted Project or MOU Recommendation" compared to the "Cost Savings Idea."

Environmental Review Process

The environmental analysis is based on a qualitative review of conceptual design drawings of the Cost Savings Ideas. These design changes to the Adopted Project and the MOU Recommendation were reviewed, and an early qualitative assessment was made of how the anticipated environmental impacts of the Adopted Project and the MOU Recommendation would change if each of the Cost Savings Ideas were implemented. It is to be noted that while anticipated environmental impacts were qualitatively assessed, no cost estimate of changes to the environmental mitigation was performed at this time.

The Cost Savings Ideas were reviewed with the transportation metrics of light rail access and ridership, traffic impacts, vehicle and pedestrian access. The Cost Savings Ideas were also reviewed for potential impacts to the environmental elements of noise and vibration, visual appearance, property acquisitions, wetlands, parklands and historic properties. The Cost Savings Ideas were not reviewed for potential

environmental impacts to land use, economics, social/neighborhoods, air quality, water resources, energy, geology and soils, hazardous materials, electromagnetic fields, public services or utilities, as impacts of the concepts to these elements were assumed to be the same or very similar to those of the Adopted Project and the MOU Recommendation.

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

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

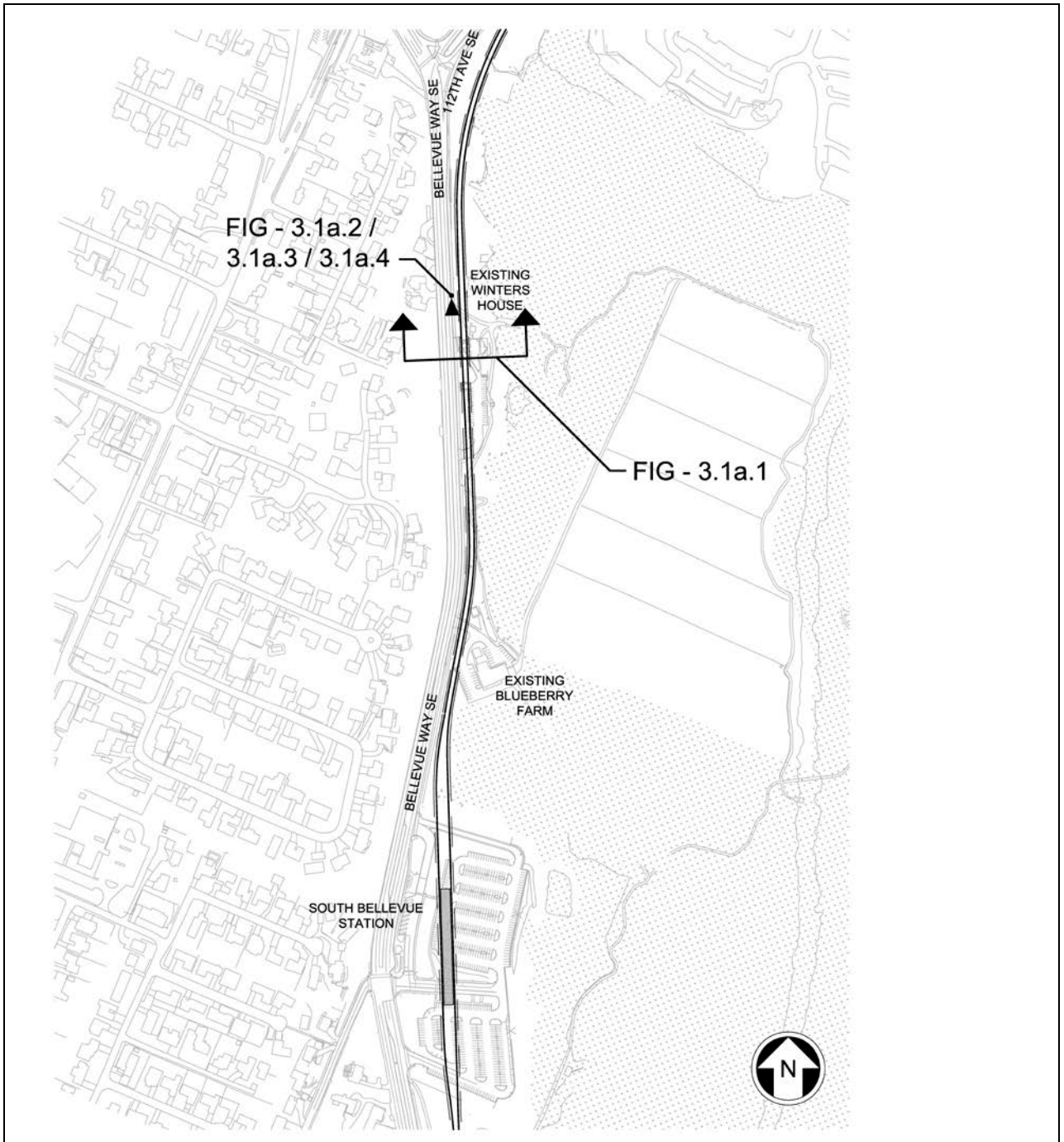


Figure 3.1a.0:
Shift Bellevue Way West—1a

Table 3-2
Cost Savings Evaluation: Shift Bellevue Way, Proposal – 1a

Cost Savings Evaluation Worksheet	
Description: Shift Bellevue Way West to Allow Space for At-Grade LRT in Front of Winters House	**Proposal: 1a**
Adopted 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.	
Cost Savings Idea: Shift Bellevue Way West – This Cost Savings Idea eliminates the trench section in front of the Winters House repositions and extends the aerial guideway south of the park and ride transitioning to an at-grade alignment at the existing north bound lanes of Bellevue Way. The existing sidewalk along eastern side of Bellevue Way and yard in front of the Winter House is maintained, therefore, preserving the historic property around the Winter House. The Bellevue Way four-lane roadway is shifted westerly and realigned parallel to the tracks. An 8-foot shoulder is added along the relocated western side of the shifted Bellevue Way. Why Consider this Alternative? • Reduces construction cost • Reduces construction risk by replacing a retained cut/lidded trench with an at-grade alignment • Improves light rail operations due to fewer vertical changes in the alignment • Provides additional separation between light rail and the Winters House • Maintains access to the Blueberry Farm.	

	Adopted Project Estimate (2010 $ M)	**Cost Savings Idea Estimate (2010 $ M)**	**Range of Savings (2010 $ M)**
Cost Analysis	$22	$13	$6 to $10

Environmental Screening Results		
Resource (Potential Impacts)	**Adopted Project LRT in Trench**	**Cost Savings Idea LRT at-grade**
LRT Operations	Vertical alignment geometry near maximum allowable design criteria.	Vertical alignment geometry below 4% and within desirable range. Improves LRT Operations.
LRT Access and Ridership	N/A	N/A
Traffic (Mobility)		
• Traffic Impacts	N/A	N/A

Resource (Potential Impacts)	Adopted Project LRT in Trench	Cost Savings Idea LRT at-grade
• Vehicle Access	Blueberry Farm access is rerouted and combined with access to the Winters House.	Winters House access is re-routed and combined with existing access to Blueberry Farm. Closure of secondary residential driveway –primary access remaining.
• Pedestrian Access	Winters House access unchanged. Blueberry Farm access is rerouted and combined with Winters House access.	Same as Adopted Project. Sidewalk access is retained.
Noise and Vibration	Moderate noise impacts on west side of Bellevue Way SE south of Winters House, mitigated with sound walls and building sound insulation. Potential for vibration/groundborne noise impact at Winters House that can be mitigated with special trackwork.	Increased light rail and traffic noise on west side of Bellevue Way SE from at-grade profile and shifting traffic closer to residences, mitigated with sound walls and building sound insulation. Reduced potential for vibration at Winters House. Groundborne noise impact eliminated
Visual Appearance	Lidded trench in front of Winters House. No changes west of Bellevue Way SE.	Light rail more visible from extended aerial guideway north from the existing park and ride as well as from the at-grade profile in front of Winters House; loss of vegetation and a retaining wall on west side of Bellevue Way SE.
Other Environmental Elements Affected by the Proposed Change		
• Property Impacts	One residential displacement.	Additional three residential displacements and several partial acquisitions west of Bellevue Way SE.
• Wetlands	Wetland and buffer impacts east of Bellevue Way SE.	Similar impacts south of Winters House, less impact north of house.
• Parklands	Light rail located within west edge of Mercer Slough Nature Park. The Blueberry Farm retail is relocated near the Winters House with a combined driveway.	Similar impacts south of Winters House, slightly less impacts north of house. Parking access is changed to existing Blueberry Farm.

Resource (Potential Impacts)	Adopted Project LRT in Trench	Cost Savings Idea LRT at-grade
• 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.
Schedule Risk	N/A	Moderate – will likely require simplified Section 106 MOA with Federal Transit Administration and Department of Archaeology and Historic Preservation.

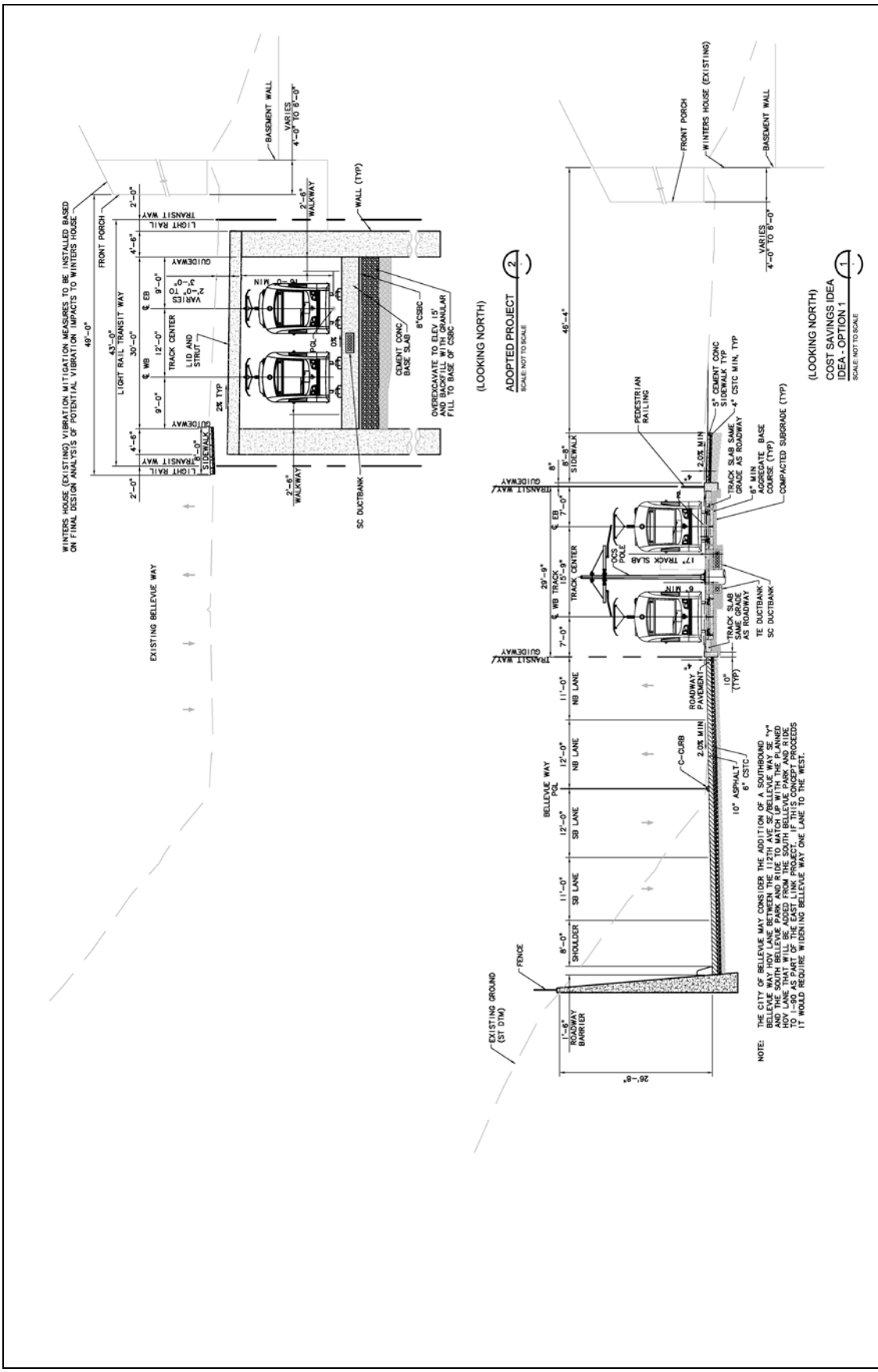


Figure 3.1a.1:
Shift Bellevue Way West—1a Adopted Project Compared to Cost Savings Idea

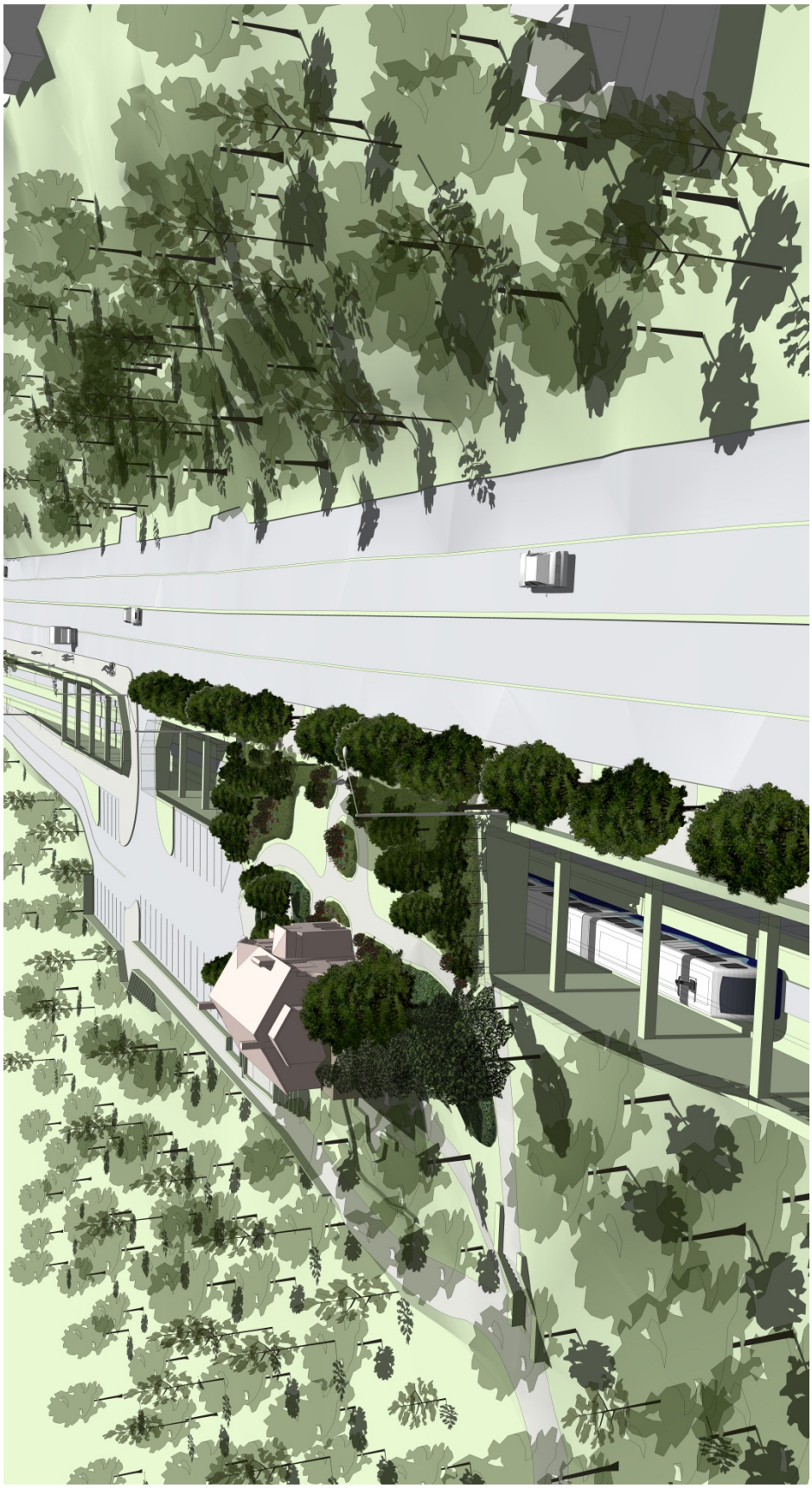


Figure 3.1a.2:
Bellevue Way - Adopted Project

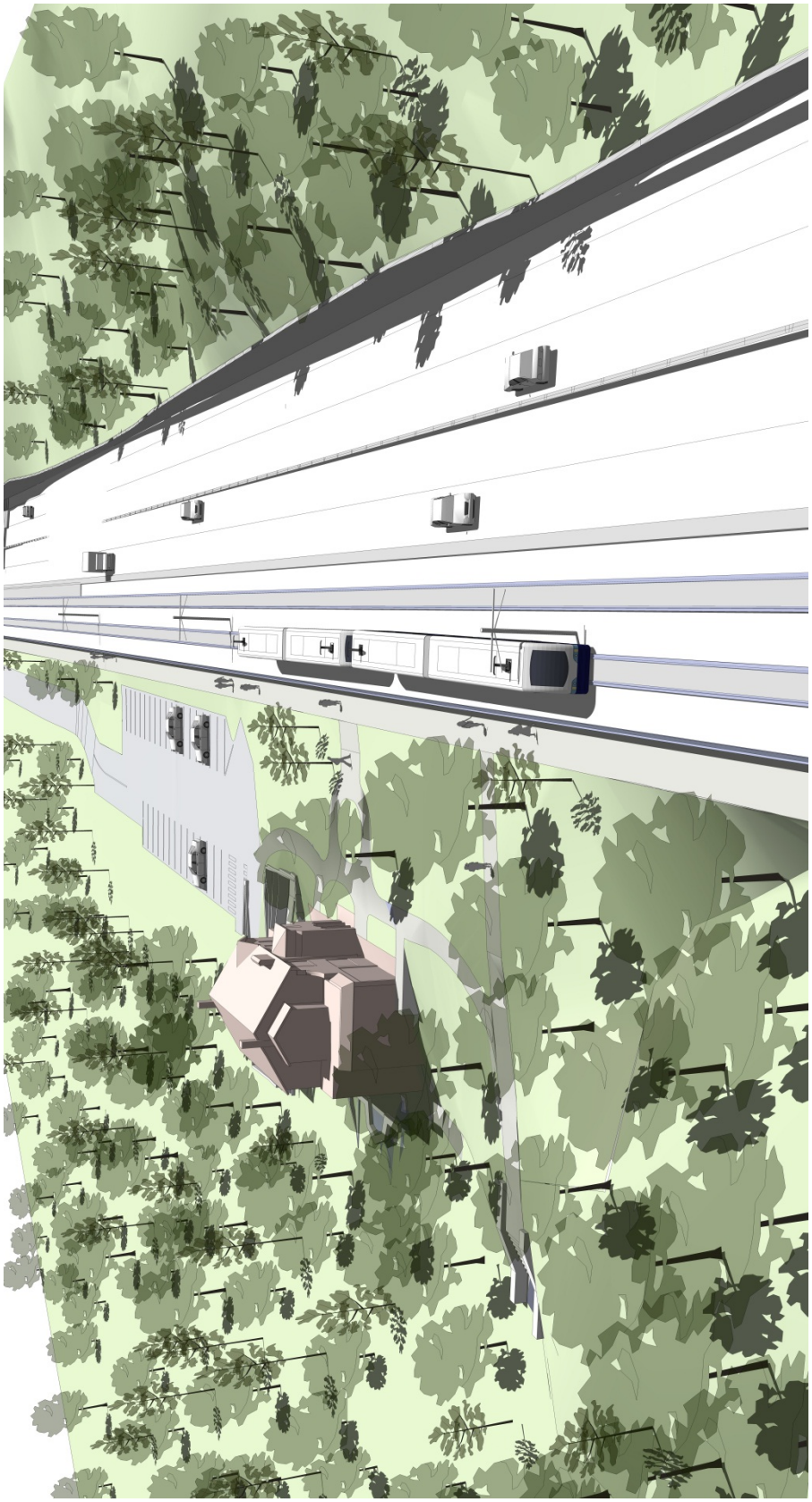


Figure 3.1a.3:
Bellevue Way West—1a Cost Savings Idea

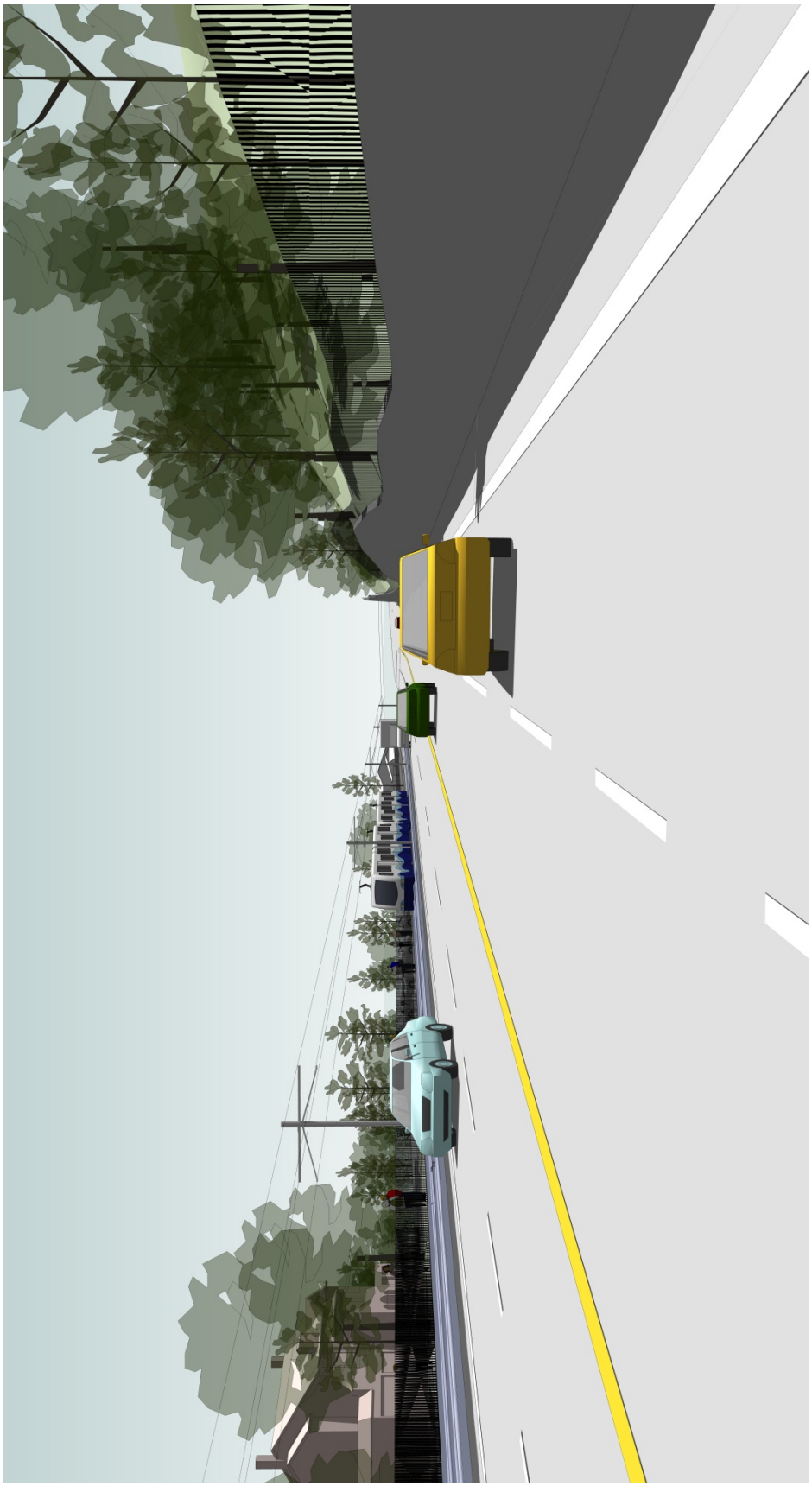


Figure 3.1a.4:
Bellevue Way West Street View Looking South—1a Cost Savings Idea

3.1.2 Cost Savings Idea 1b – Relocate Winters House, At-Grade Alignment

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

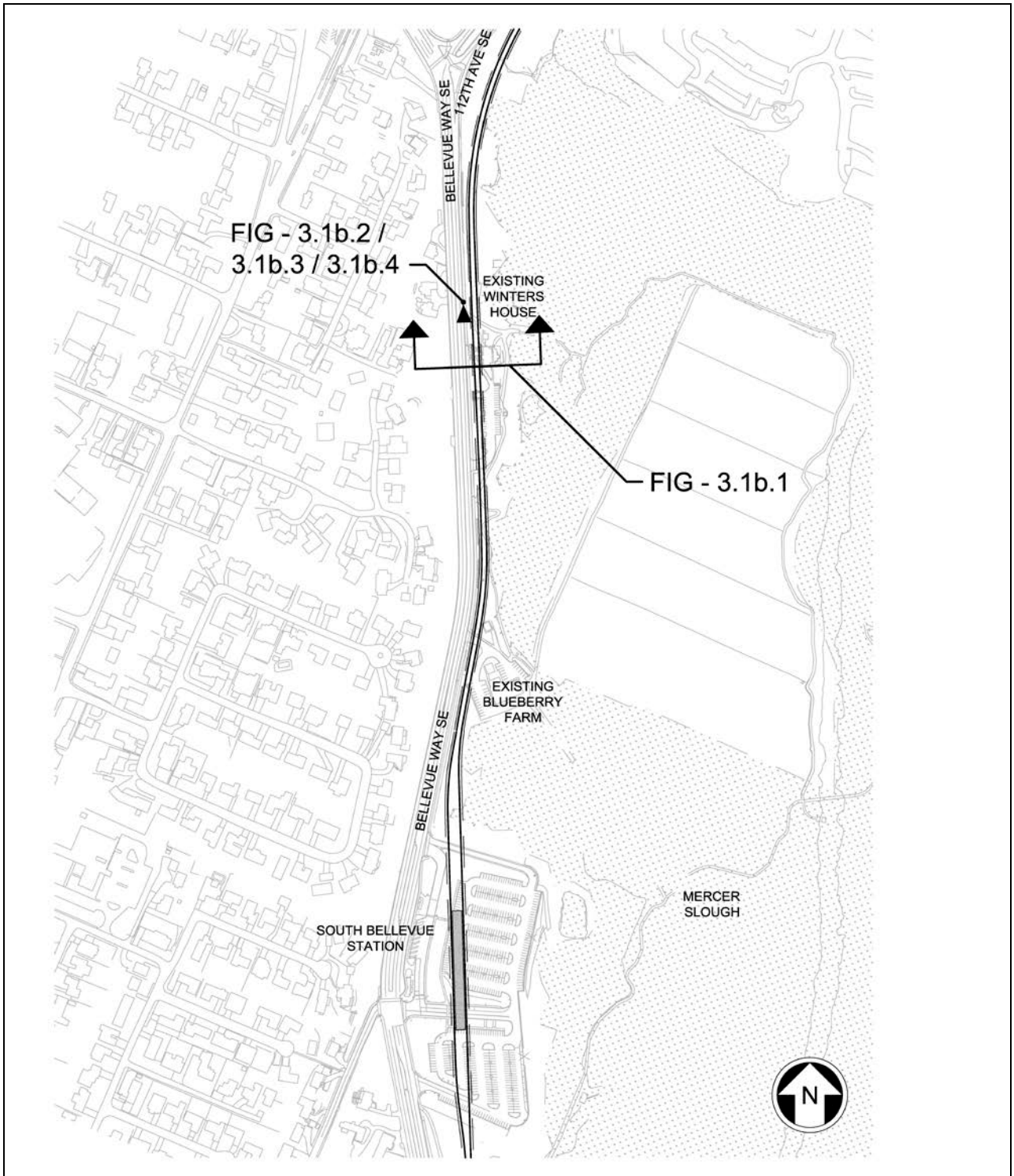


Figure 3.1b.0:
Relocate Winters House—1b

Table 3-3
Cost Savings Evaluation: Bellevue Way Alignment, Proposal – 1b

Cost Savings Evaluation Worksheet	
Description: Bellevue Way Alignment - Relocate Winters House, At-grade Alignment	**Proposal: 1b**
Adopted Project: The Adopted Project Concept configuration along the eastern side of Bellevue Way includes an elevated guideway starting at the South Bellevue Station platform, continuing north, and then transitioning to a retained trench section with a lid structure at the Winters House. The LRT continues north of the Winters House, then gradually transitioning from the trenched section to retained fill section at approximately the intersection of Bellevue Way and 112th Ave. SE. The Adopted Project Concept configuration mitigates operational impacts to the historic Winters House by placing the trackway below grade in a lidded retained trench section, within the 50-foot historic buffer around the Winters House.	
Cost Savings Idea: Relocate Winters House: This Cost Savings Idea includes relocating the Winters House and constructing LRT at-grade in front of the Winters House. This concept extends the aerial structure north of the park and ride and replaces the retained trench section, with an at-grade profile and keeps the same horizontal alignment as the Adopted Project Concept configuration. The proposal intends to reduce Project costs by eliminating a costly below grade structure, eliminating excavation, shoring and reducing ground improvement. This results in an encroachment of the light rail on the Winters House historic property within about 5 feet of the house. Options to relocate the house include moving it just east of its current location or locating it near the Blueberry Farm. Why Consider this Alternative? • Reduces construction cost. • Construction risk is reduced by replacing a retained trench/lidded trench with an at-grade alignment. • Improves light rail operations due to fewer vertical changes in the alignment. • Maintains access to the Blueberry Farm.	

	Adopted Project Estimate (2010 $ M)	**Cost Savings Idea Estimate (2010 $ M)**	**Range of Savings (2010 $ M)**
Cost Analysis	$19	$13	$4 to $7

Environmental Screening Results		
Resource (Potential Impacts)	**Adopted Project**	**Cost Savings Idea**
LRT Operations	Vertical alignment geometry near maximum allowable design criteria.	Vertical alignment geometry below 4% and within desirable range. Improves LRT Operations.
LRT Access and Ridership	N/A	N/A
Traffic (Mobility)		
• Traffic Impacts	N/A	N/A

Resource (Potential Impacts)	Adopted Project	Cost Savings Idea
• Vehicle Access	Blueberry Farm access is rerouted and combined with access to the Winters House.	Winters House access is re-routed and combined with o existing access at the Blueberry Farm.
• Pedestrian Access	Winters House access unchanged. Blueberry Farm access is rerouted and combined with Winters House access.	Winters House access is re-routed and combined with access to Blueberry Farm at existing driveway. New north access also provided to Winters House at 112th and Bellevue Way.
Noise and Vibration	Moderate noise impacts on west side of Bellevue Way SE south of Winters House, mitigated with sound walls and building sound insulation. Potential for vibration/groundborne noise impact at Winters House that can be mitigated with special trackwork.	Increased light rail noise exposure on west side of Bellevue Way SE from at-grade profile, mitigated with sound walls and building sound insulation. Reduced potential for vibration at Winters House. Groundborne noise impact eliminated.
Visual Appearance	Lidded trench in front of Winters House. No changes west of Bellevue Way SE.	Light rail more visible from extended aerial guideway north from the existing park and ride as well as from the at-grade profile in front of Winters House.
Other Environmental Elements Affected by the Proposed Change		
• Property Impacts	One residential displacement.	Same as Adopted Project.
• Wetlands	Wetland and buffer impacts east of Bellevue Way SE.	Additional wetland impacts, depending on Winters House relocation site.
• Parklands	Light rail located within west edge of Mercer Slough Nature Park. The Blueberry Farm retail is relocated near the Winters House with a combined driveway.	Similar to Adopted Project, except Winters House relocated elsewhere in the park. Parking access is changed to existing Blueberry Farm.
• Historic Properties	Lidded trench under front yard of Winters House, potential for construction damage.	Winters House relocated elsewhere in Mercer Slough Nature Park, potential for damage during relocation.

Resource (Potential Impacts)	Adopted Project	Cost Savings Idea
Schedule Risk	N/A	Higher - requires modifications to Section 106 MOA with FTA and DAHP.

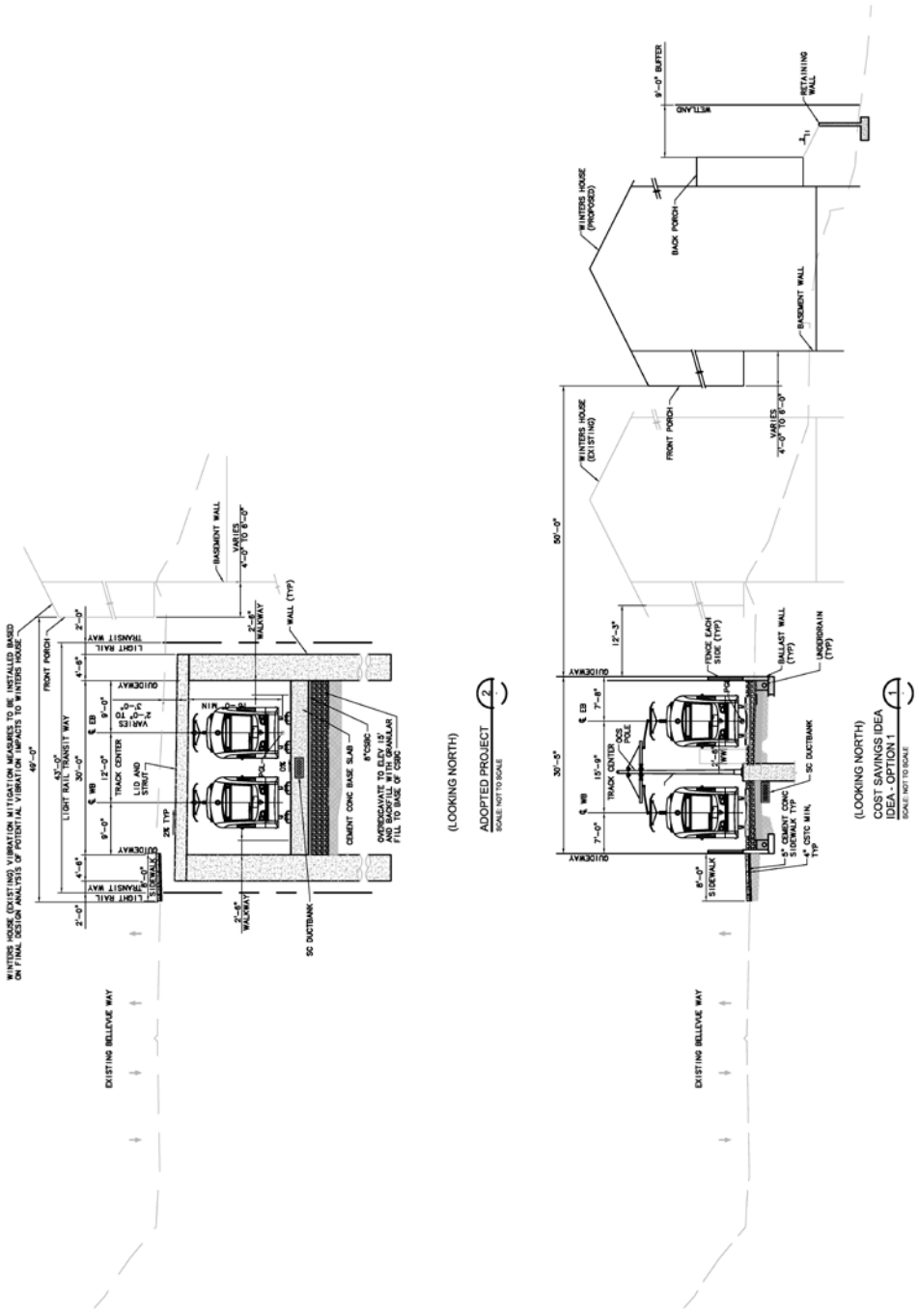


Figure 3.1b.1:
Winters House—1b Adopted Project Compared to Cost Savings Idea (Note: House could be relocated near to Blueberry Farm)

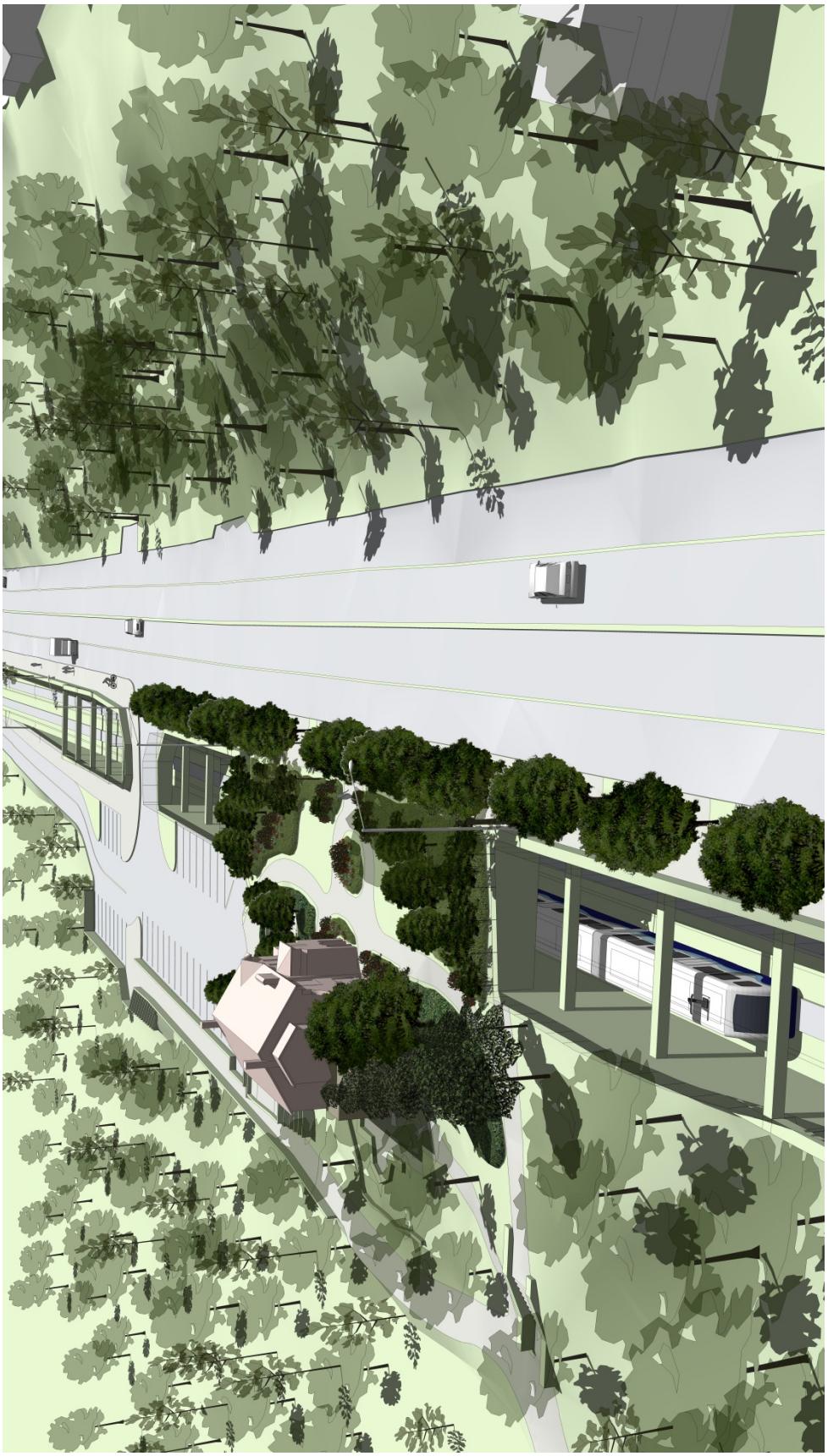


Figure 3.1b.2:
Winters House—Adopted Project

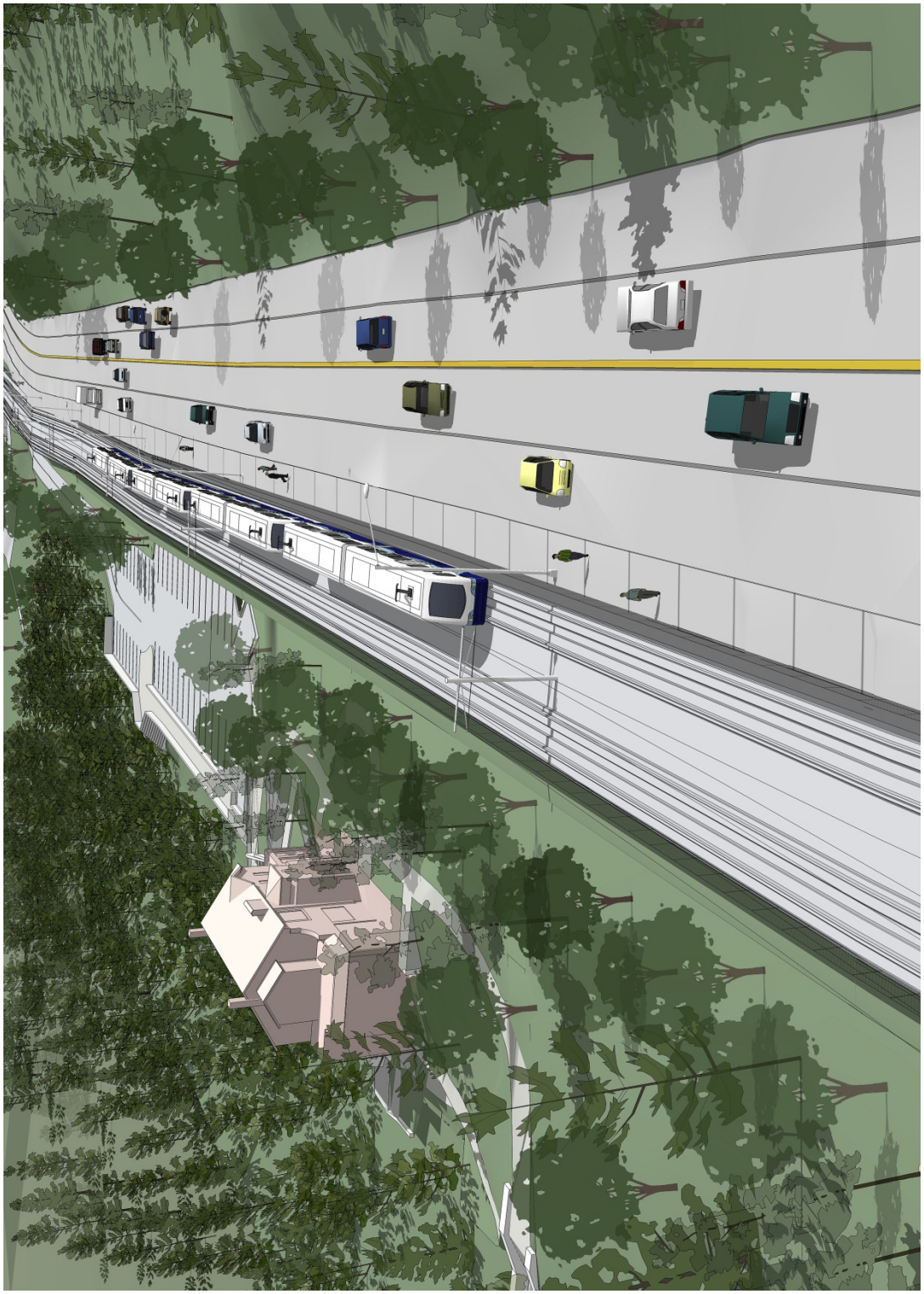


Figure 3.1b.3:
Relocate Winters House—1b Cost Savings Idea (Note: House could be relocated near to the Blueberry Farm)

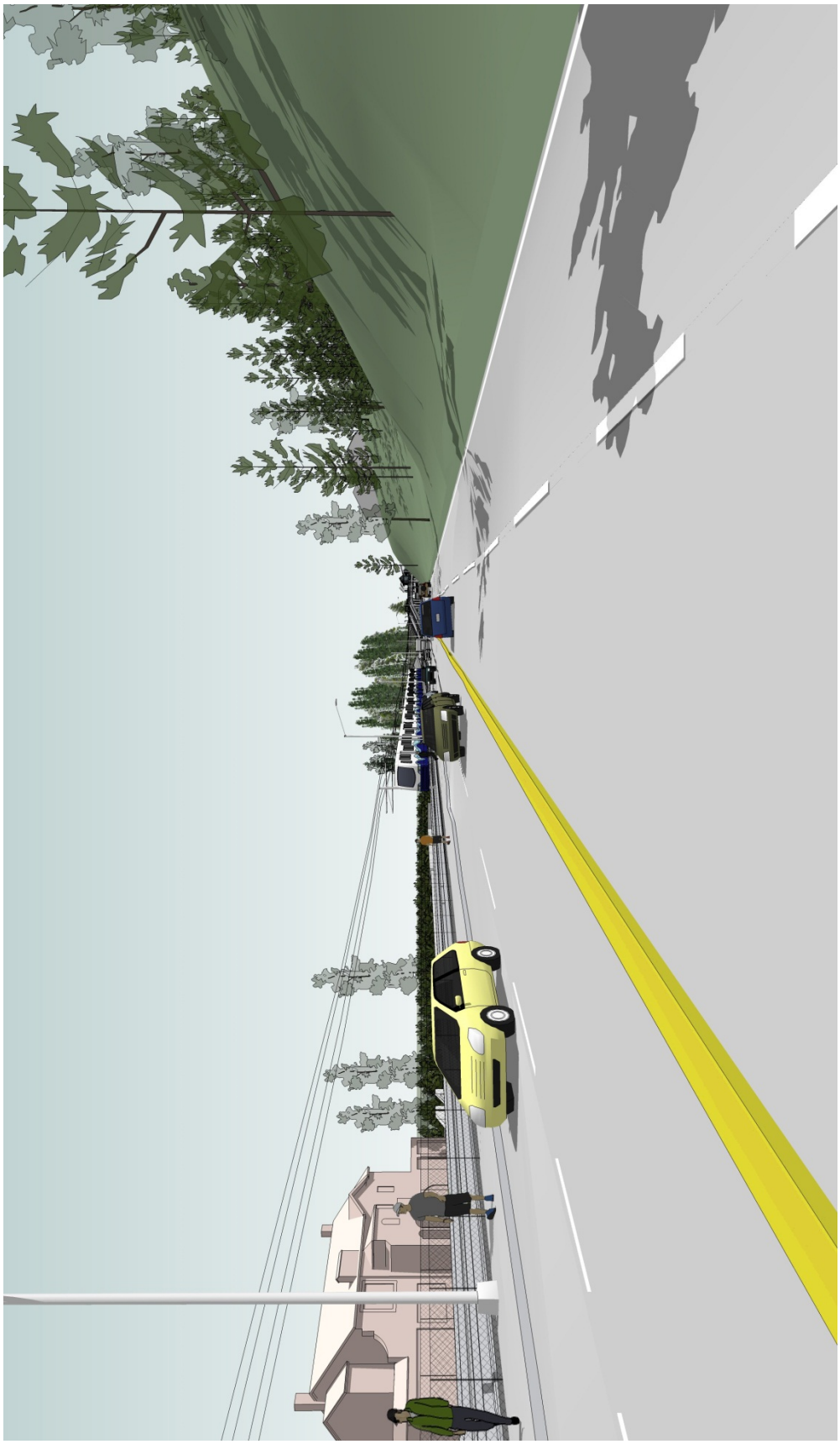


Figure 3.1b.4:
Relocate Winters House Street View Looking South —1b Cost Savings Idea

3.2 112th Ave. SE Alignment at Surrey Downs Park

3.2.1 Cost Savings Idea 2a –112th Ave. SE Alignment at Surrey Downs Park

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

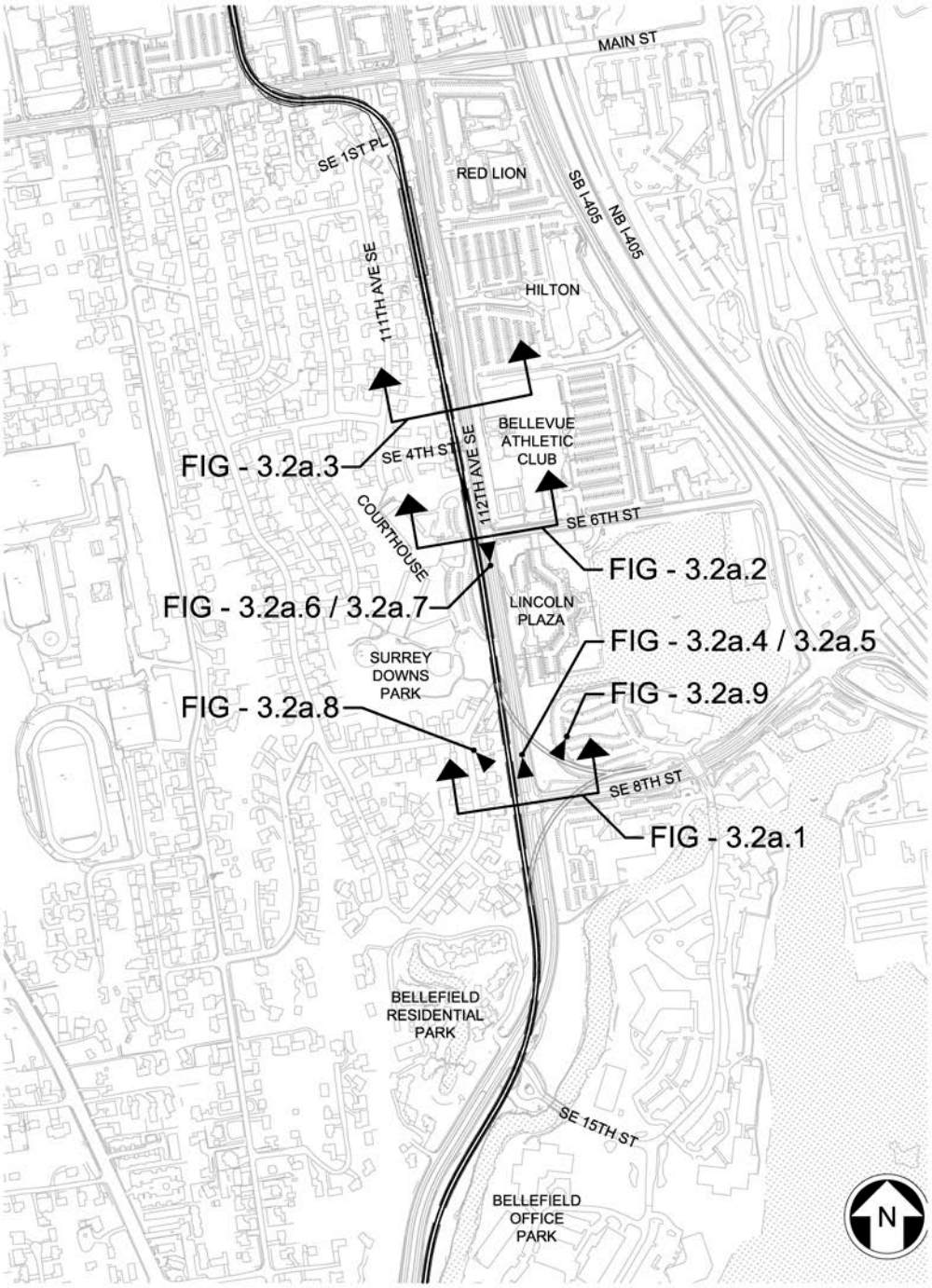


Figure 3.2a.0:
112th Ave. SE Alignment at Surrey Downs Park—2a

Table 3-4
Cost Savings Evaluation: 112th Alignment, Proposal – 2a

Cost Savings Evaluation Worksheet	
Description: 112th Ave. SE Alignment at Surrey Downs Park	**Proposal: 2a**
MOU Recommendation: 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 retained cut trench north of SE 8th Street. North of SE 8th St., the alignment continues in a retained cut trench, sufficiently deep to cross below a reconstructed SE 4th St., after which the alignment transitions close to at-grade for the East Main station. This concept maintains Surrey Downs neighborhood access at SE 4th St.	
Cost Savings Idea: 112th Ave. SE Alignment at Surrey Downs Park - The Cost Savings Idea extends the elevated guideway slightly further north after crossing 112th Ave. SE to accommodate a new roadway for neighborhood access below the aerial guideway at SE 8th St. The LRT will then transition north to an at-grade alignment north of SE 8th St. The new road extension west at SE 8th St. replaces the Surrey Downs neighborhood access from 112th Ave. SE at SE 4th St. Why Consider this Alternative? • Reduces construction cost • Construction risk is reduced by replacing a retained cut trench with an at-grade alignment • Improves light rail operations due to fewer vertical changes in the alignment • Avoids the need for a bridge at SE 4th St. • Improves drainage within the trackway	

	MOU Recommendation Estimate (2010 $ M)	**Cost Savings Idea Estimate (2010 $ M)**	**Range of Savings (2010 $ M)**
Cost Analysis	$57	$50	$5 to $9

Environmental Screening Results

Resource (Potential Impacts)	**MOU Recommendation**	**Cost Savings Idea**
LRT Operations	Complex vertical alignment with multiple grade changes and close vertical curves.	Relatively flat vertical alignment geometry, with minimal grades and long vertical tangents creating better rider comfort.
LRT Access and Ridership	N/A	N/A
Traffic (Mobility)		

Resource (Potential Impacts)	MOU Recommendation	Cost Savings Idea
• Traffic Impacts	Intersections along 112th Ave. SE operate acceptably.	Intersection impacts at SE 8th St. and 112th Ave SE. due to extension of SE 8th St. and a new traffic light.
• Vehicle Access	SE 4th St. to 112th Ave. SE remains open. SE 8th St. to 112th Ave. SE remains a "T" intersection. Surrey Down Park access closed from 112th Ave. SE.	Provides neighborhood access by extending SE 8th St. west to 111th Ave. SE. while closing SE 4th St. connection to 112th Ave. SE. Closes access to Surrey Downs Park from 112th Ave. SE. providing access from either or both SE 4th or SE 8th /111th Ave. SE.
• Pedestrian Access	SE 4th St. to 112th Ave. SE remains open. Surrey Downs Park access closed from 112th Ave. SE. Sidewalk provided along 112th Ave. SE.	SE 4th St. closed. SE 8th St. open to Surrey Downs Neighborhood. Surrey Downs Park access closed from 112th Ave. SE. Sidewalk provided along 112th Ave. SE.
Noise and Vibration	Moderate and severe noise impacts west of 112th Ave. SE, mitigated with sound walls, building sound insulation and special trackwork. A few vibration impacts on west side of 112th Ave. SE near SE 8th St. that can be mitigated.	Increased light rail and traffic noise from longer and higher elevated section, at-grade section, and extended SE 8th St., mitigated with sound walls, building sound insulation and special trackwork. Similar vibration impacts to MOU project, mitigated with special trackwork.
Visual Appearance	Elevated section and straddle bent over 112th Ave. SE. Retained cut with high retaining walls in Surrey Downs Park.	Greater visibility from longer and higher elevated section and at-grade section. Reduces height of retaining wall along Surrey Downs Park. New SE 8th St. access creates different views in the area.
Other Environmental Elements Affected by the Proposed Change		

Resource (Potential Impacts)	MOU Recommendation	Cost Savings Idea
• Property Impacts	Multiple partial and 16 full acquisitions on west side of 112th Ave. SE.	Additional 3 residential displacements on west side of 112th Ave. SE. due to SE 8th St. extension.
• Parklands	No direct access to park from 112th Ave. SE: replaced with new access from SE 4th St., and parkland acquisition for retained cut on east side of park.	No access to park from 112th Ave. SE: Park access replaced with new access from within Surrey Downs neighborhood from SE 4th St. or 111th Ave. SE. Similar parkland acquisition.
Schedule Risk	Moderate - potential for additional Federal review with changes to Surrey Downs Park.	Same as MOU Recommendation.

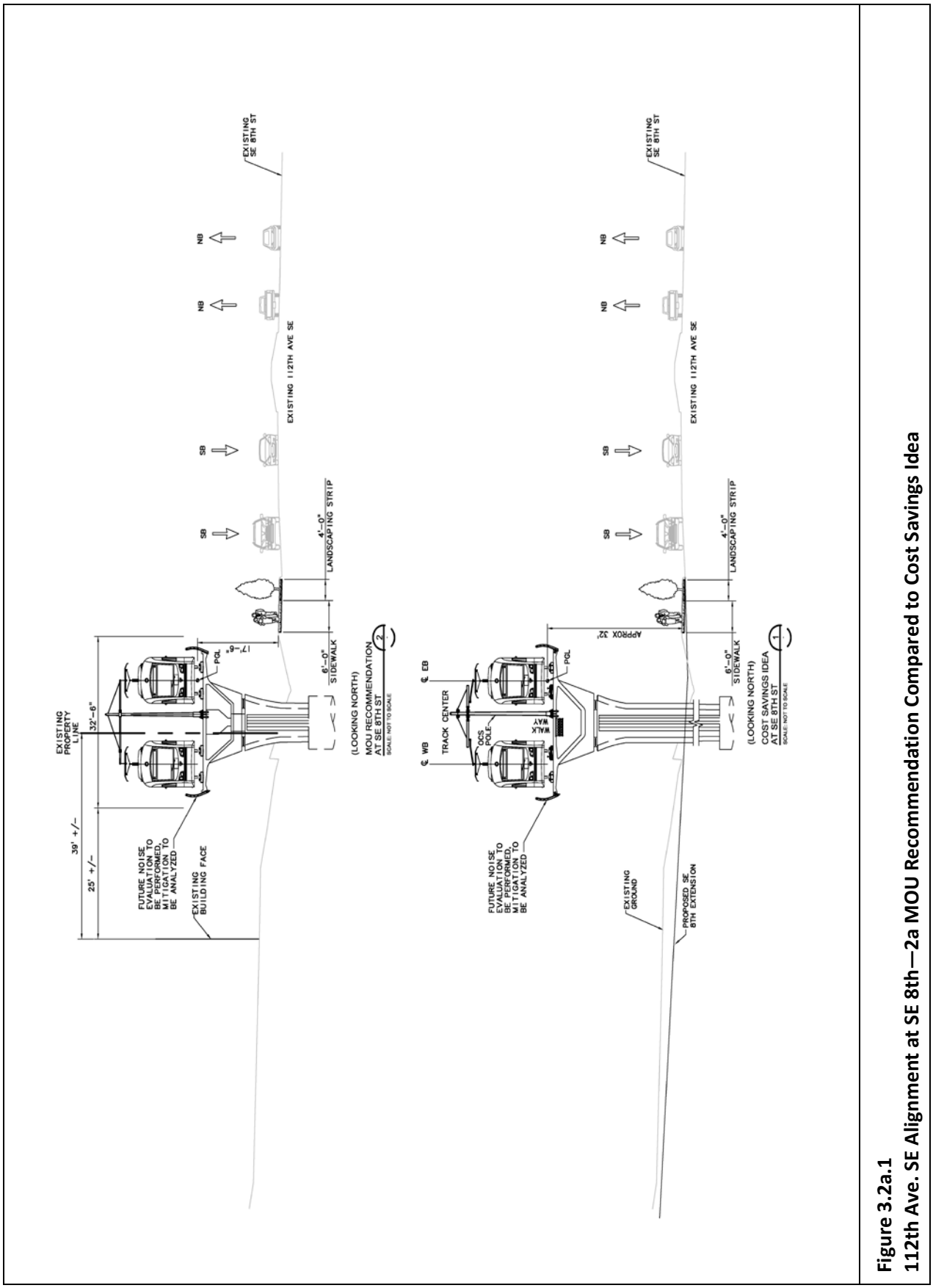


Figure 3.2a.1
112th Ave. SE Alignment at SE 8th—2a MOU Recommendation Compared to Cost Savings Idea

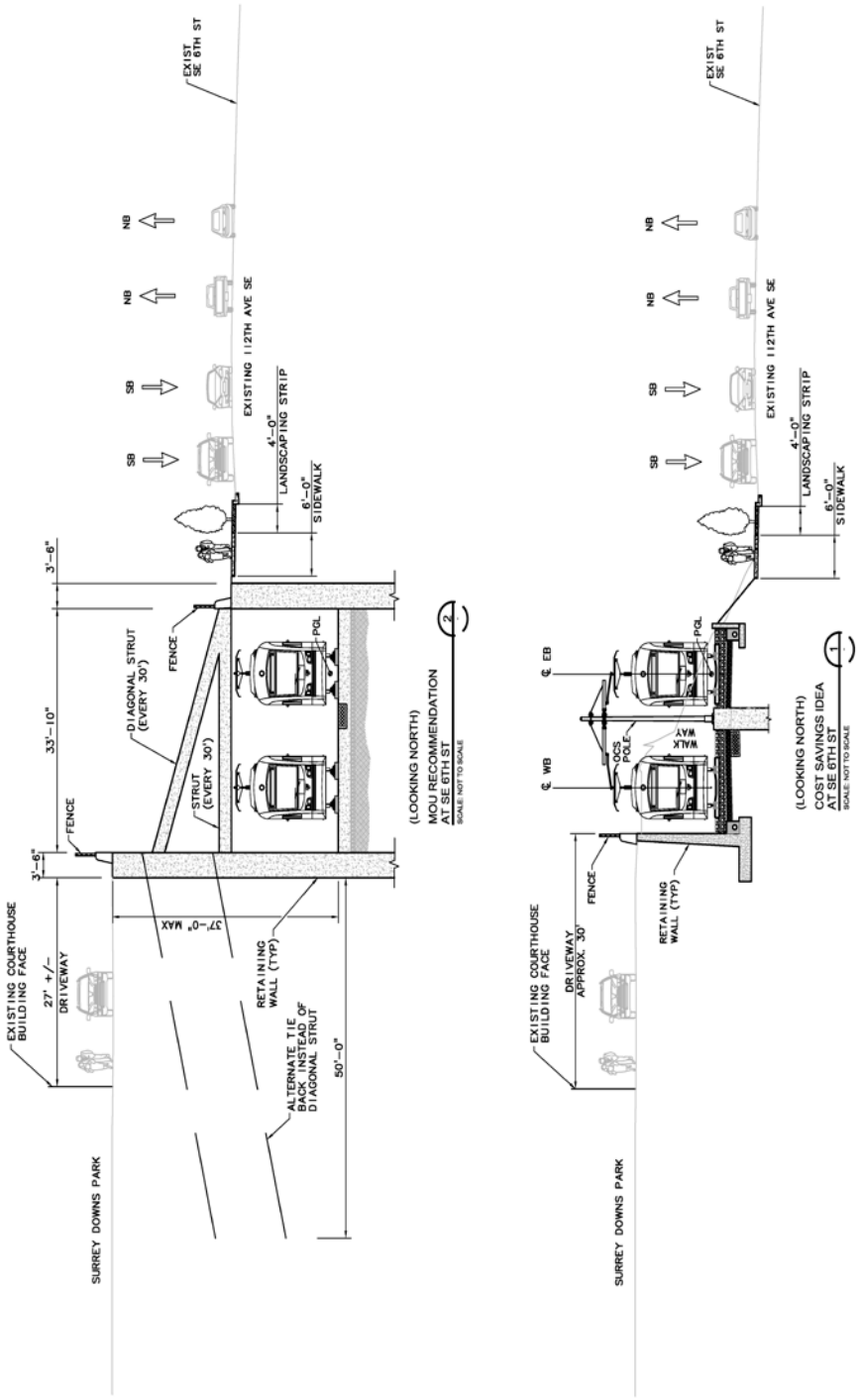


Figure 3.2a.2
112th Ave. SE Alignment at SE 6th—2a MOU Recommendation Compared to Cost Savings Idea

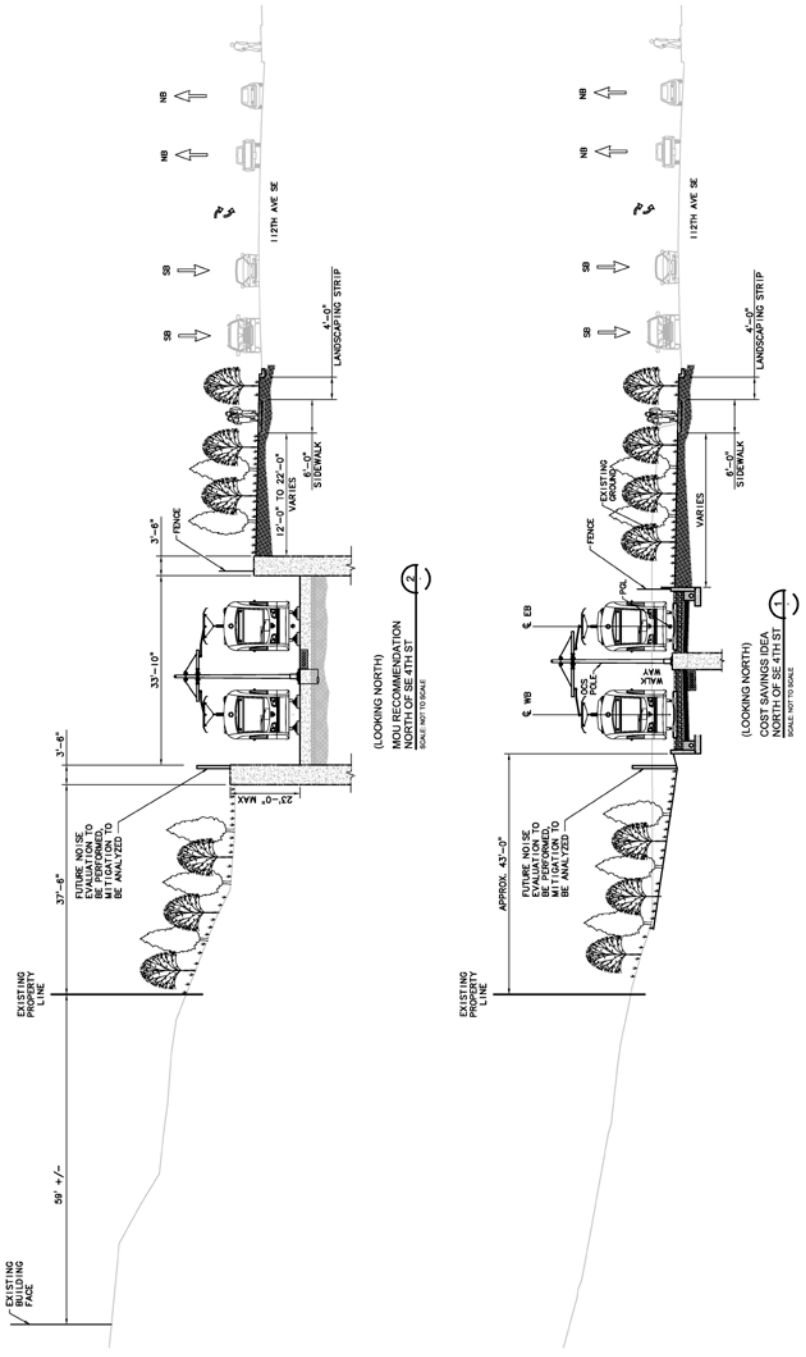


Figure 3.2a.3
112th Ave. SE Alignment North of SE 4th—2a MOU Recommendation Compared to Cost Savings Idea

Figure 3.2a.4
112th Ave. SE Alignment Looking South at SE 8th—2a MOU Recommendation

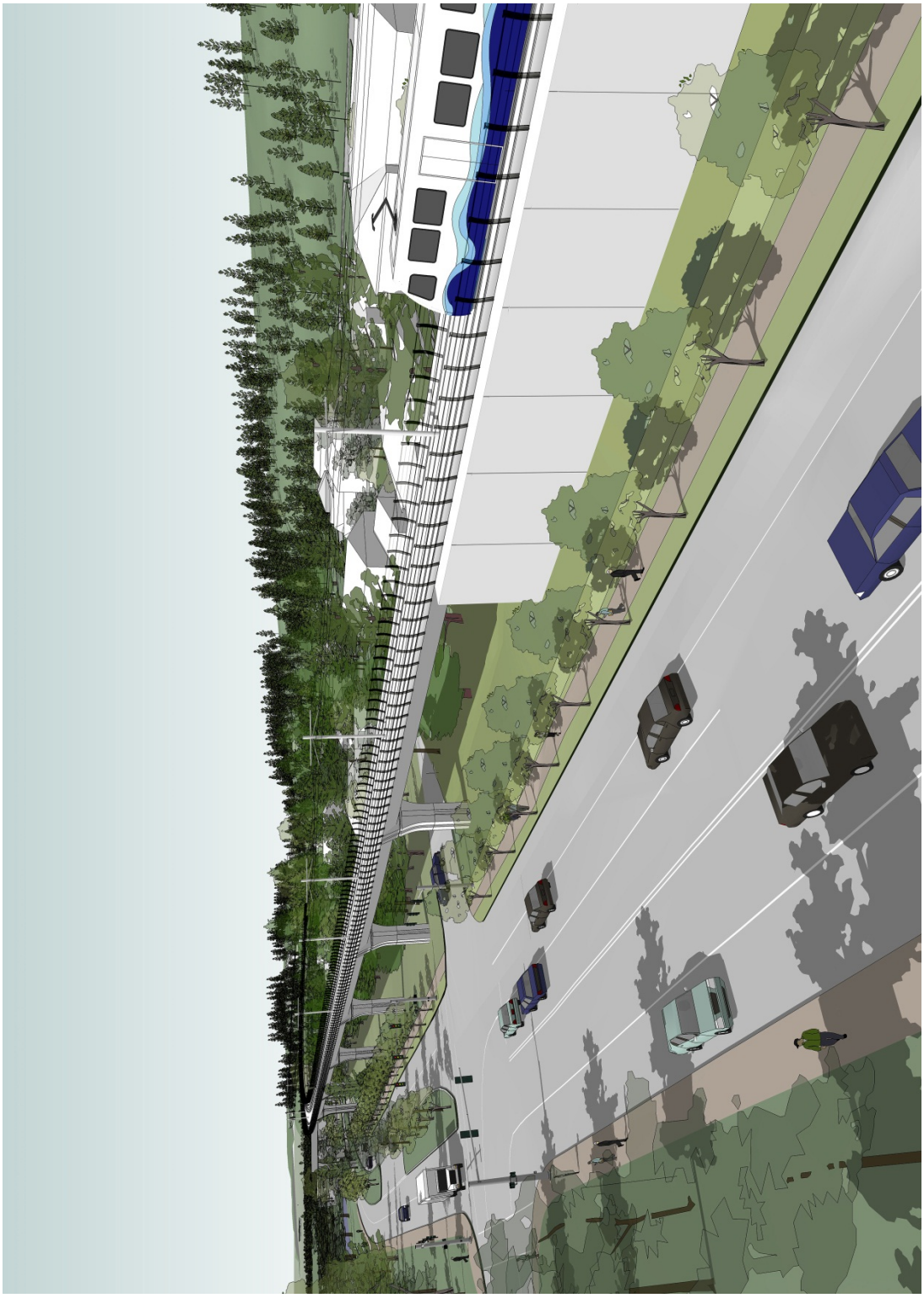


Figure 3.2a.5
112th Ave. SE Alignment Looking South at SE 8th—2a Cost Savings Idea

Figure 3.2a.6
112th Ave. SE Alignment Looking North at SE 6th—2a MOU Recommendation

Figure 3.2a.7
112th Ave. SE Alignment Looking North at SE 6th—2a Cost Savings Idea

Figure 3.2a.8
112th Ave. SE Alignment Looking Southeast at SE 8th/111th Ave. SE—2a Cost Savings Idea

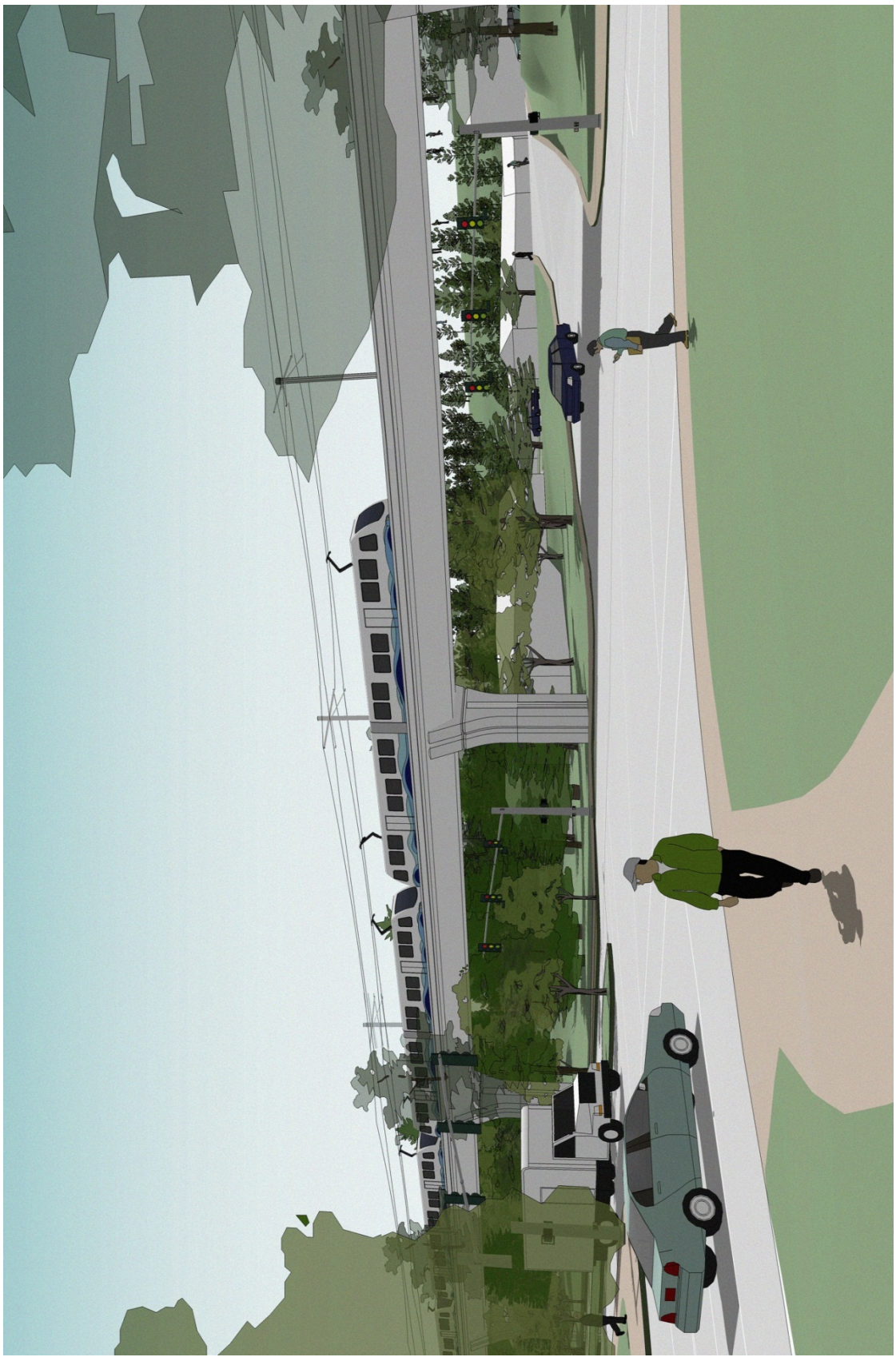


Figure 3.2a.9
112th Ave. SE Alignment Looking South West at SE 8th—2a Cost Savings Idea

3.3 Downtown Station Design

3.3.1 Cost Savings Idea 3a – Eliminate Mezzanine

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

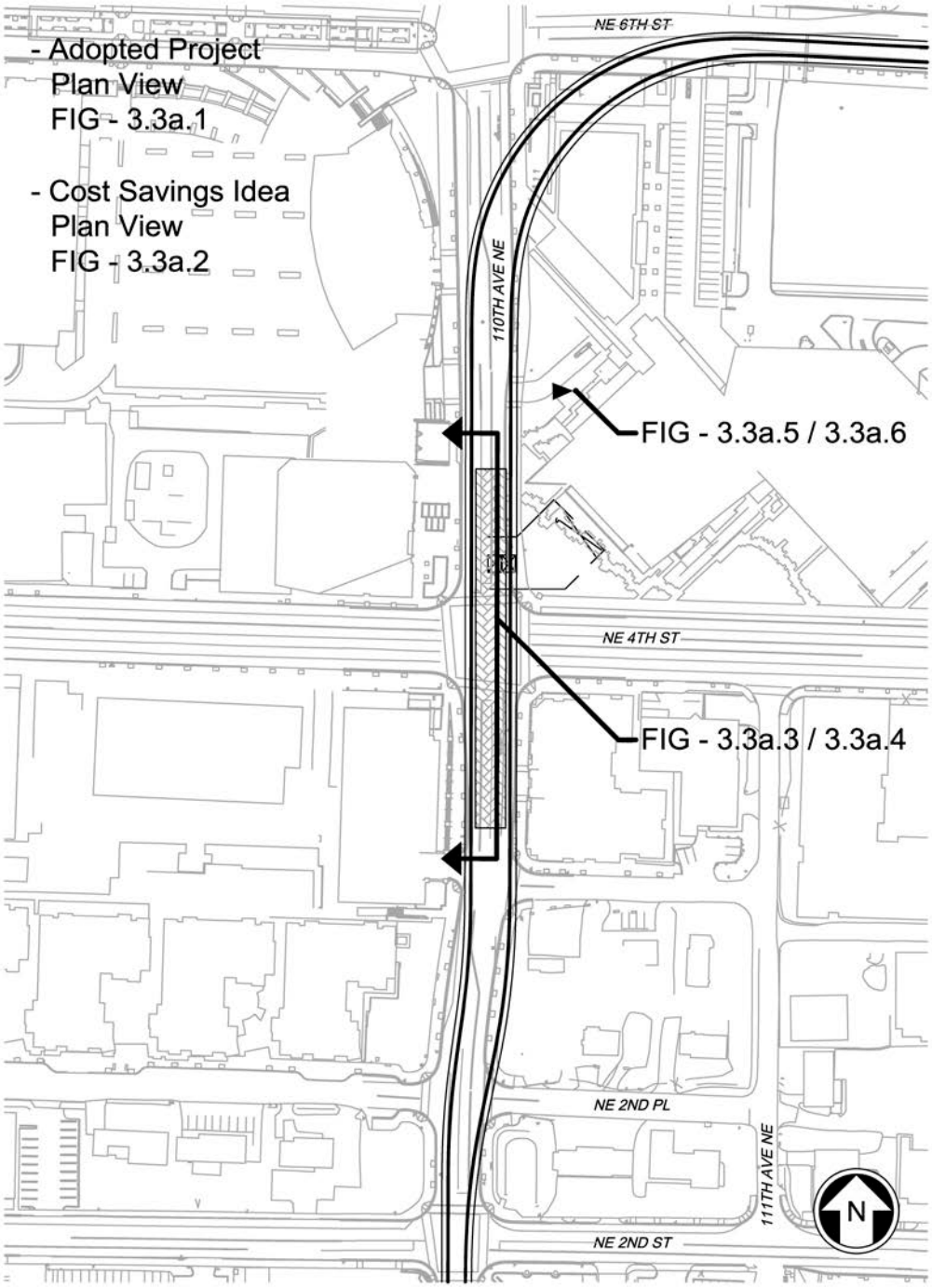


Figure 3.3a.0:
Eliminate Mezzanine—3a

Table 3-5
Cost Savings Evaluation: Downtown Station, Proposal – 3a

Cost Savings Evaluation Worksheet			
Description: Downtown Station Design			**Proposal: 3a**
Adopted 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.			
Cost Savings Idea: Eliminate mezzanine - Provide access to the center station platform from 110th Ave. NE. Why Consider this Alternative? • Reduces construction cost and may shorten construction duration • Improves station access by reducing the depth of the station and providing simpler, user-friendly access. • Reduces construction risk due to a shallower tunnel and station. • Similar to downtown Seattle International District Station concept.			
	Adopted Project Estimate (2010 $ M)	**Cost Savings Idea Estimate (2010 $ M)**	**Range of Savings (2010 $ M)**
Cost Analysis	$70	$64	$4 to $7
Environmental Screening Results			
Resource (Potential Impacts)	**Adopted Project**	**Cost Savings Idea**	
LRT Operations	Horizontal and vertical alignment design requires 20 MPH operations due to geometry.	Same as Adopted Project.	
LRT Access and Ridership	6,000 daily boardings at Bellevue Transit Center Station in year 2030. Access to station provided through two entrances	Slight increase in ridership due to less vertical walking distance for patrons. Access to station provided through two entrances on east side of 110th Ave. NE; north and south of NE 4th St.	
Jobs Within 5 Minute Walk Radius Residents Within 5 Minute Walk Radius	36% 14%	44% 19%	
Traffic (Mobility)			

Resource (Potential Impacts)	Adopted Project	Cost Savings Idea
• Traffic Impacts	Congestion impact requiring mitigation at NE 4th St. and 108th Ave NE.	Up to 5% increase in congestion in downtown Bellevue and southeast area of downtown from reduced travel lanes on 110th Ave. NE.
• Vehicle Access	Maintains four travel lanes on 110th Ave. NE.	Reduces travel lanes on 110th Ave NE to two thru lanes –one each – north- and Southbound. Maintains turning lanes at intersections. City Hall 110th Ave. NE driveway removed.
• Pedestrian Access	Business and residential access maintained.	Same as Adopted Project.
Noise and Vibration	Moderate noise and groundborne noise impacts from elevated guideway on NE 6th St. that can be mitigated. No vibration impacts.	Increased vibration and groundborne noise from shallower tunnel that could be mitigated.
Visual Appearance	No impacts.	Same as Adopted Project.
Other Environmental Elements Affected by the Proposed Change		
• Property Impacts	Minor acquisition for station entrances.	Less property acquisition for relocated station entrances.
• Parklands	Minor acquisition of Pocket Parks for south station entrance.	Minor acquisitions of Pocket Parks for tunnel fans and vents.
Schedule Risk	N/A	Lower.

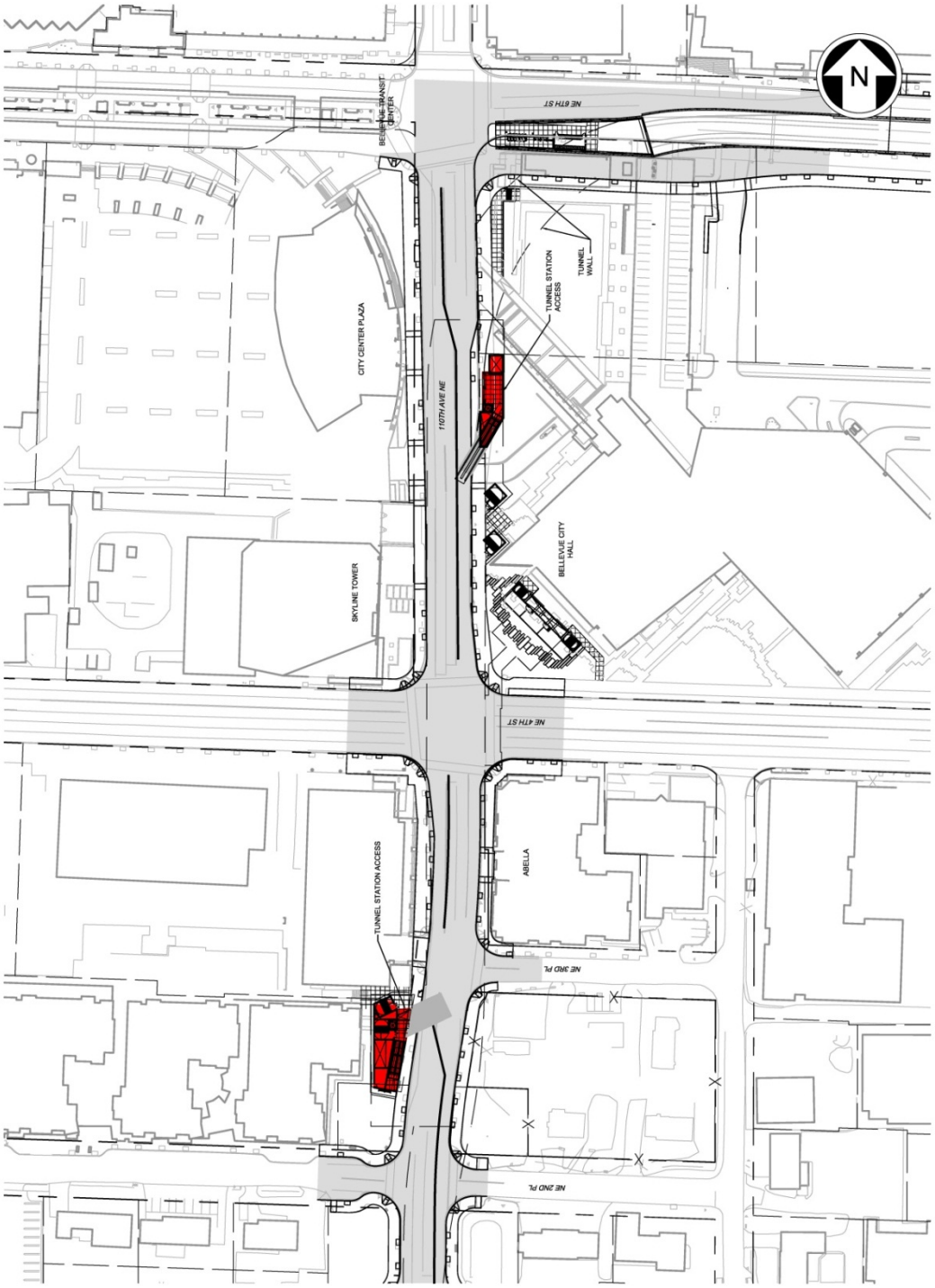


Figure 3.3a.1
Downtown Station Design - Adopted Project

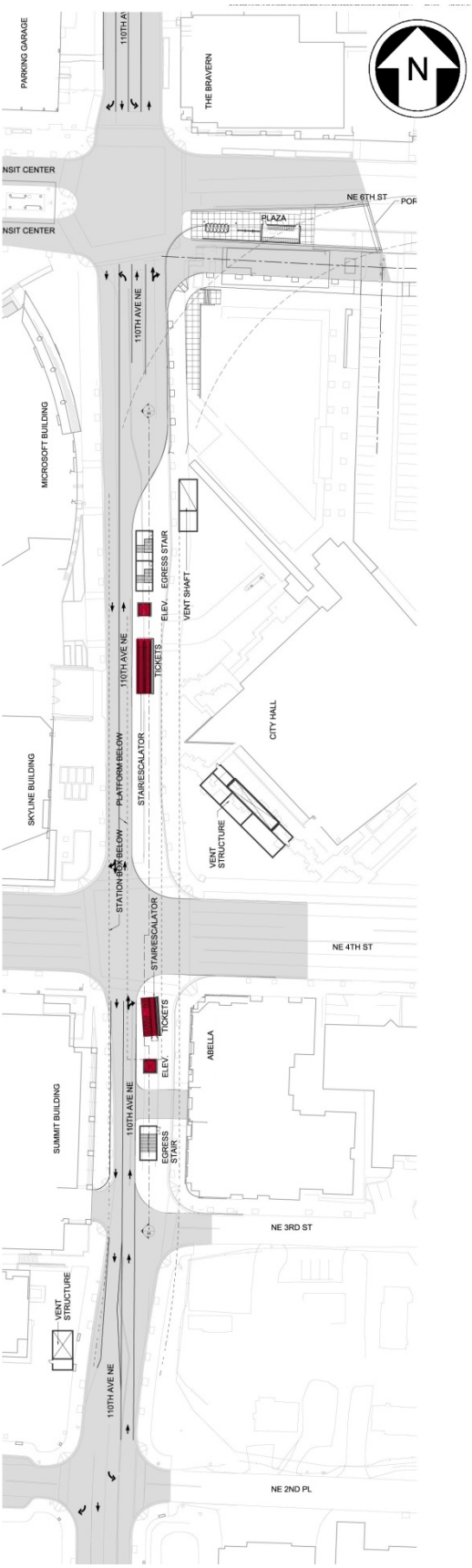


Figure 3.3a.2
Eliminate Mezzanine—3a Cost Savings Idea

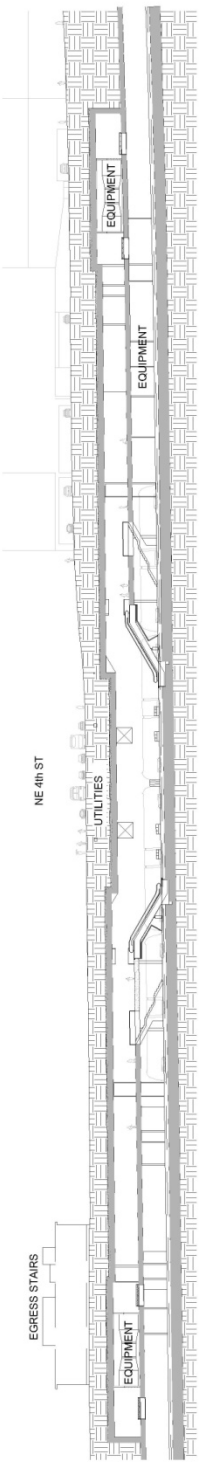


Figure 3.3a.3
Downtown Station Design - Adopted Project

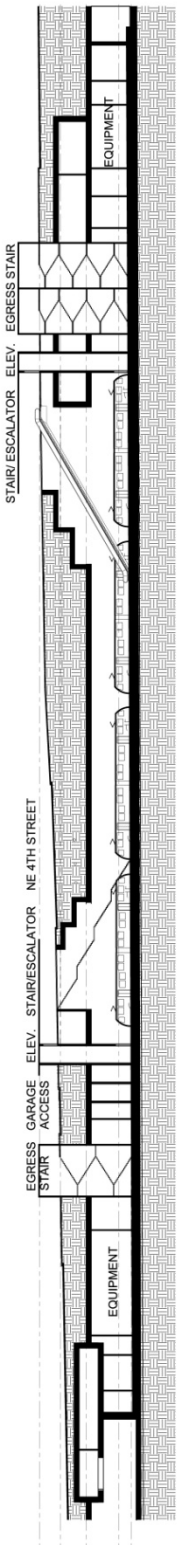


Figure 3.3a.4
Eliminate Mezzanine—3a Cost Savings Idea

Figure 3.3a.5
Downtown Station Design—3 Adopted Project

Figure 3.3a.6
Eliminate Mezzanine—3a Cost Savings Idea

3.3.2 Cost Savings Idea 3b – Stacked Tunnel Configuration

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

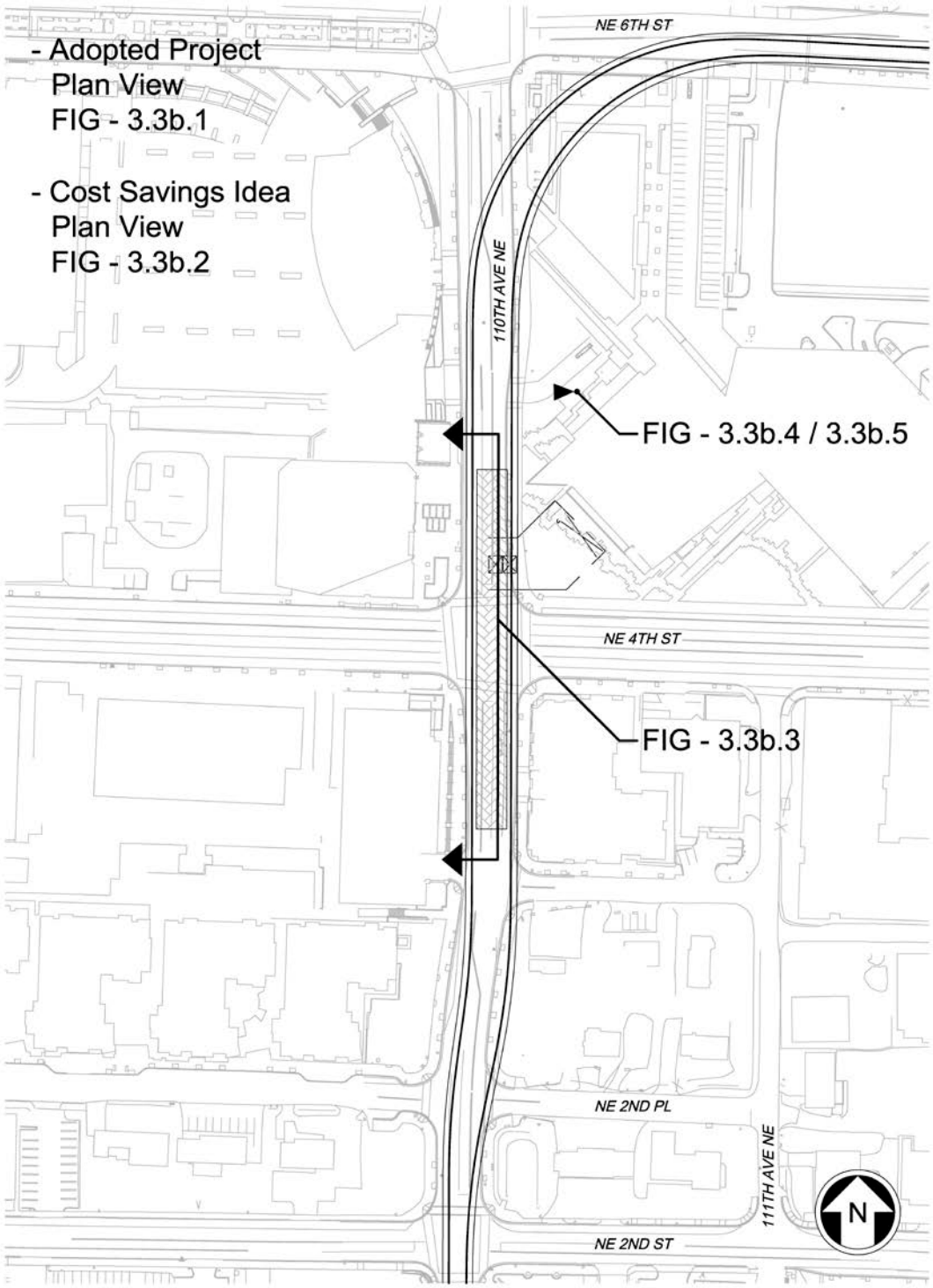


Figure 3.3b.0
Construct a Stacked Tunnel Configuration - 3b

Table 3-6
Cost Savings Evaluation: Downtown Station – 3b

Cost Savings Evaluation Worksheet			
Description: Downtown Station Design			**Proposal: 3b**
Adopted 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.			
Cost Savings Idea: Construct a stacked tunnel configuration - This idea would provide a stacked tunnel concept – providing a cut and cover tunnel and station, eliminating the mezzanine with stacked platforms on the east side of the tracks, allowing access from the east side of 110th Ave. NE. This would increase the overall depth of the station by 20 feet but reduce the structure widths. Why Consider this Alternative? • Reduces construction cost; may shorten construction duration. • Reduces construction risk due to narrower tunnel. • May reduce utility relocations due to narrower tunnel. • Successfully used in Vancouver, BC.			
	Adopted Project Estimate (2010 $ M)	**Cost Savings Idea Estimate (2010 $ M)**	**Range of Savings (2010 $ M)**
Cost Analysis	$149	$138	$8 to $13
Environmental Screening Results			
Resource (Potential Impacts)	**Adopted Project**	**Cost Savings Idea**	
LRT Operations	Horizontal and vertical alignment design requires 20 MPH operations due to geometry.	Same as Adopted Project.	
LRT Access and Ridership	6,000 daily boardings at Bellevue Transit Center Station in year 2030. Access to tunnel provided through two entrances	Same as Adopted Project. Access to station provided through two entrances on east side of 110th Ave. NE; north and south of NE 4th St.	
Jobs Within 5 Minute Walk Radius Residents Within 5 Minute Walk Radius	36% 14%	38% 14%	
Traffic (Mobility)			

Resource (Potential Impacts)	Adopted Project	Cost Savings Idea
• Traffic Impacts	Congestion impacts requiring mitigation at NE 4th St. and 108th Ave NE.	Up to 5% increase in congestion in downtown Bellevue and southeast area of downtown from reduced travel lanes on 110th Ave. NE.
• Vehicle Access	Maintains four travel lanes on 110th Ave. NE	Allows three lanes – on 110th Ave. NE - eliminates one lane. City Hall 110th Ave. NE driveway removed.
• Pedestrian Access	Maintains residential and business access.	Same as Adopted Project.
Noise and Vibration	Moderate noise and groundborne noise impacts from elevated guideway on NE 6th St. that can be mitigated. No vibration impacts.	Increased vibration and groundborne noise from reconfigured tunnel that could be mitigated.
Visual Appearance	No impacts.	Same as Adopted Project.
Other Environmental Elements Affected by the Proposed Change		
• Property Impacts	Minor acquisition for station entrances.	Less property acquisitions for relocated station entrances.
• Parklands	Minor acquisition of Pocket Parks for south station entrance.	Minor acquisitions of Pocket Parks for tunnel fans and vents.
Schedule Risk	N/A	Lower.

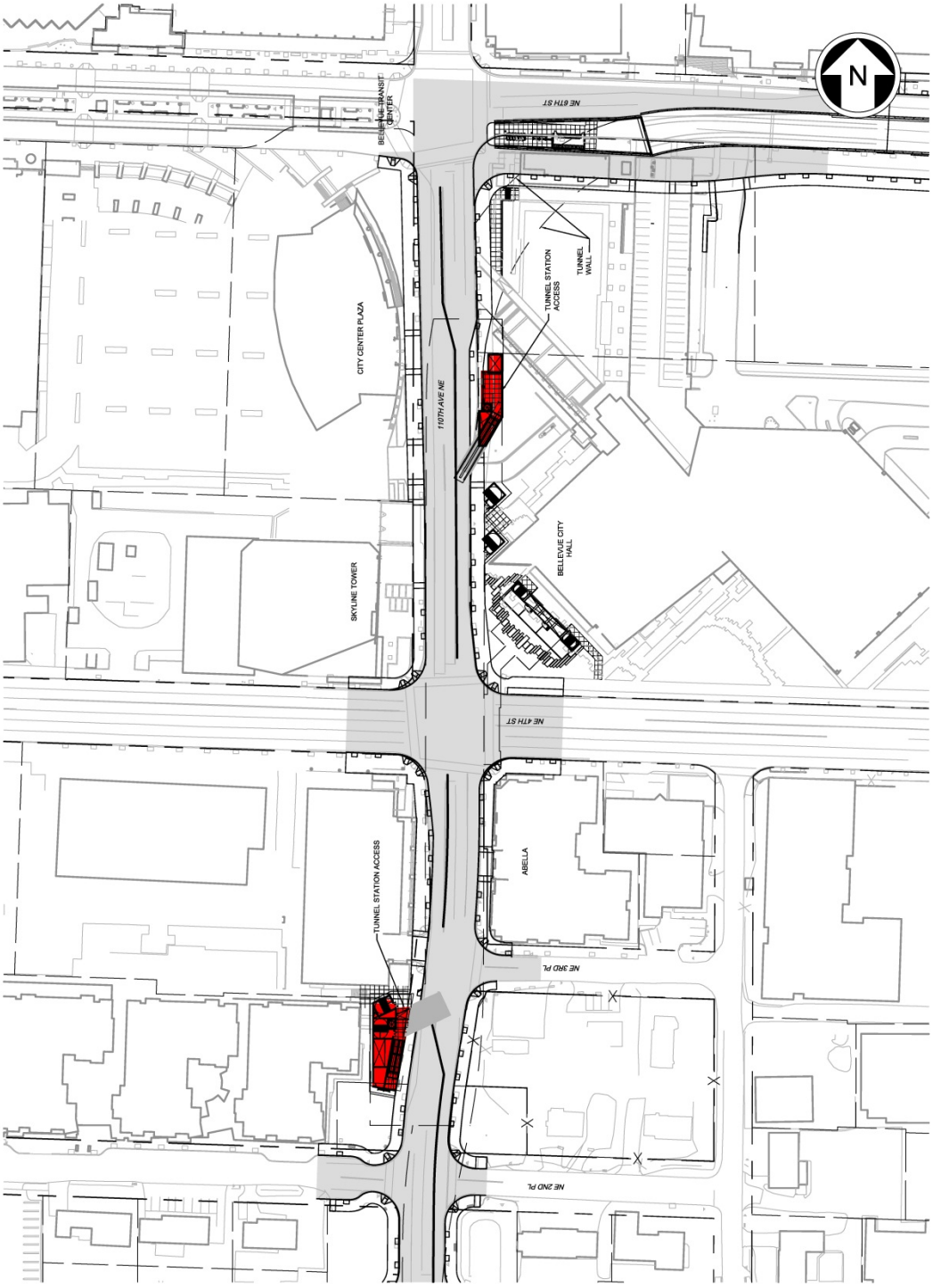


Figure 3.3b.1
Downtown Station Design - Adopted Project

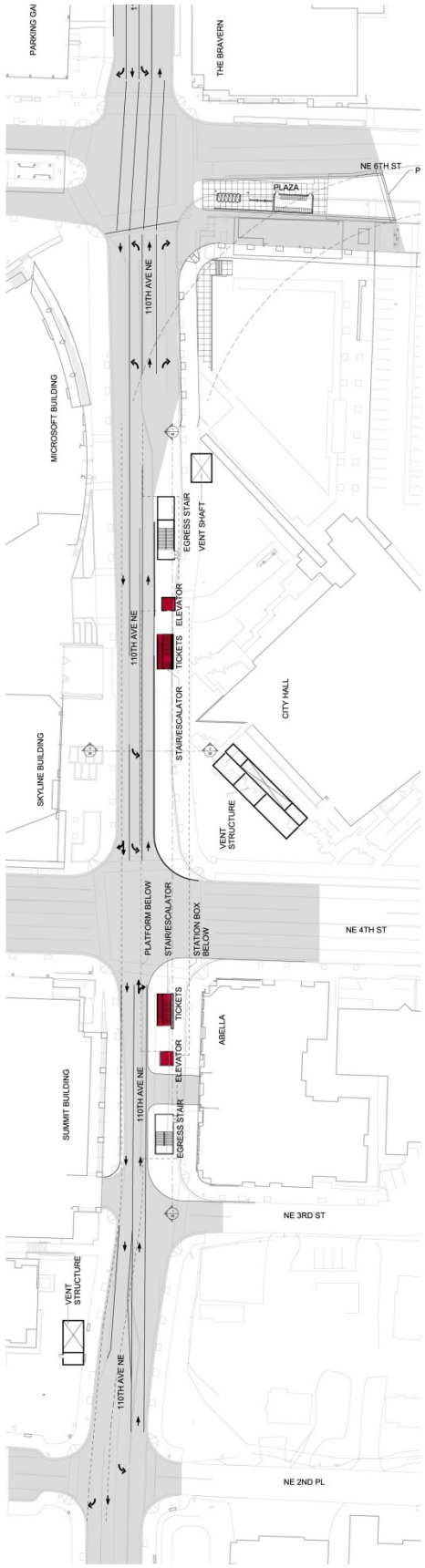


Figure 3.3b.2
Construct a Stacked Tunnel Configuration—3b Cost Savings Idea

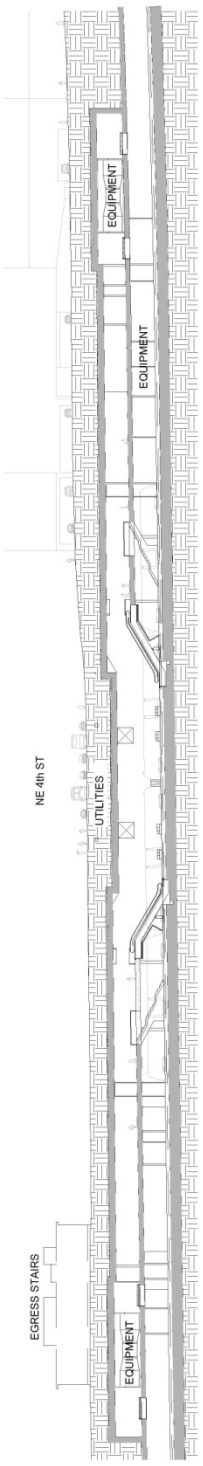


Figure 3.3b.3
Downtown Station Design - Adopted Project

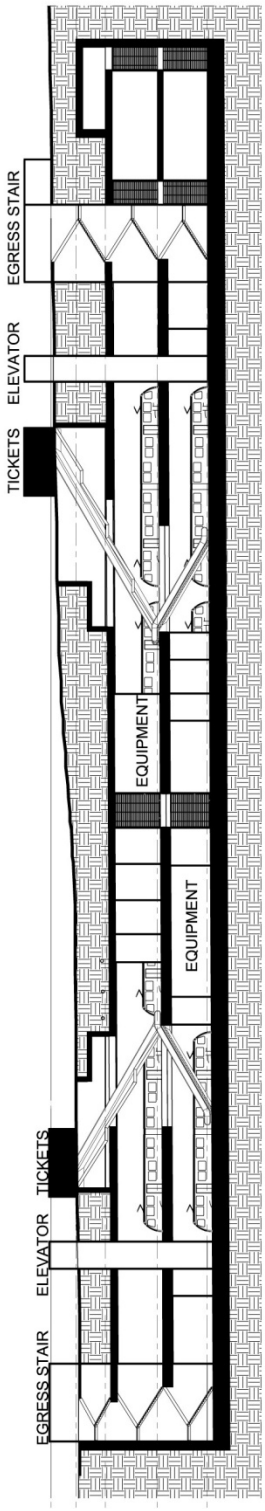


Figure 3.3b.4
Construct a Stacked Tunnel Configuration—3b Cost Savings Idea

Figure 3.3b.5
Downtown Station Design - Adopted Project

Figure 3.3b.6
Construct a Stacked Tunnel Configuration—3b Cost Savings Idea

3.3.3 Cost Savings Idea 3c – Relocate Station to NE 6th (Parallel)

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

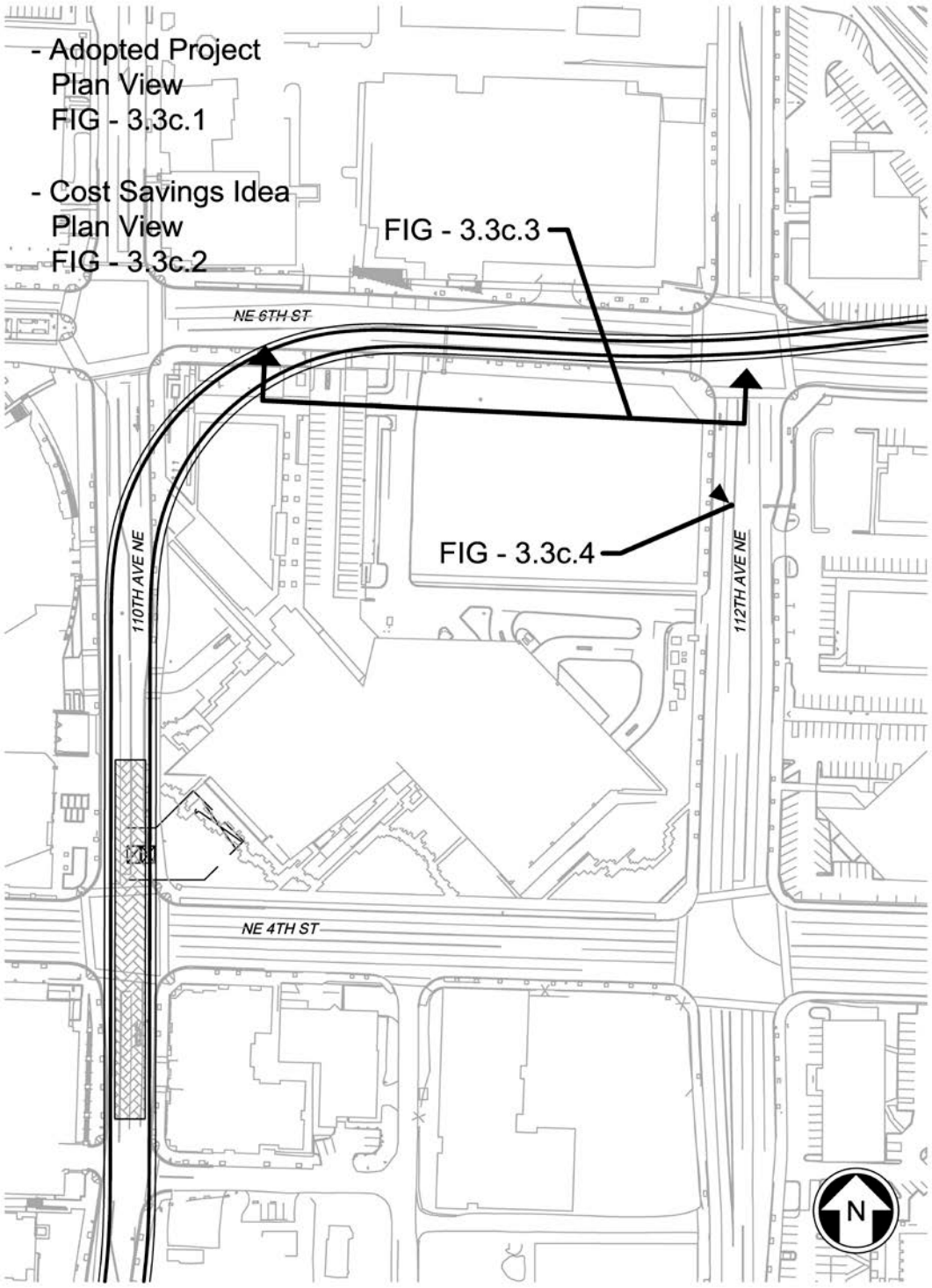


Figure 3.3c.0:
Relocate Station to NE 6th—3c

Table 3-7
Cost Savings Evaluation, Downtown Station, Proposal – 3c

Cost Savings Evaluation Worksheet			
Description: Downtown Station Design			**Proposal: 3c**
Adopted Project: Provide 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.			
Cost Savings Idea: Relocate station to NE 6^{tth} (Parallel). Move the station to NE 6th St. with above-grade station access on the west end. Why Consider this Alternative? • Reduces construction cost; may shorten construction duration. • Reduces construction risk due to replacement of subway station with an elevated station. • Reduces construction risk due to a shallower tunnel. • Greater visibility of the station.			
	Adopted Project Estimate (2010 $ M)	**Cost Savings Idea Estimate (2010 $ M)**	**Range of Savings (2010 $ M)**
Cost Analysis	$188	$173	$10 to $18
Environmental Screening Results			
Resource (Potential Impacts)	**Adopted Project**		**Cost Savings Idea**
LRT Operations	Horizontal and vertical alignment design requires 20 MPH operations due to geometry.		Horizontal and vertical alignment design requires 10 MPH operations due to horizontal radius near 150'. This will require an approval of a design deviation by Sound Transit.
LRT Access and Ridership	6,000 daily boardings at Bellevue Transit Center Station in year 2030. Access to tunnel provided through two entrances		Slightly lower ridership from single station entrance. One station access at NE 6th St.
Jobs Within 5 Minute Walk Radius Residents Within 5 Minute Walk Radius	36% 14%		33% 4%
Resource (Potential Impacts)	**Adopted Project**		**Cost Savings Idea**

Traffic (Mobility)		
• Traffic Impacts	Congestion impact requiring mitigation at NE 4th St. and 108th Ave NE in downtown Bellevue.	Same as Adopted Project.
• Vehicle Access	Maintains four travel lanes on 110th Ave. NE	Maintains 4 lanes on 110th Ave. Maintains 5 lanes on NE 6th. NE 6th St/City hall access removed. Limits access to future development on Metro Site.
• Pedestrian Access	Maintains residential and business access.	Same as Adopted Project. May affect access to Metro Site.
Noise and Vibration	Moderate noise and groundborne noise impacts from elevated guideway on NE 6th St. that can be mitigated. No vibration impacts.	Added bell noise from above-grade station, mitigated with building sound insulation. Increased groundborne vibration from reconfigured tunnel that could be mitigated.
Visual Appearance	No impacts.	Greater visibility of station.
Other Environmental Elements Affected by the Proposed Change		
• Property Impacts	Minor acquisition for station entrances.	Increased property acquisition including King County Metro Site and Bellevue City Hall parking garage.
• Parklands	Minor acquisition of Pocket Parks for south station entrance.	No impact due to relocated station.
Schedule Risk	N/A	Lower.

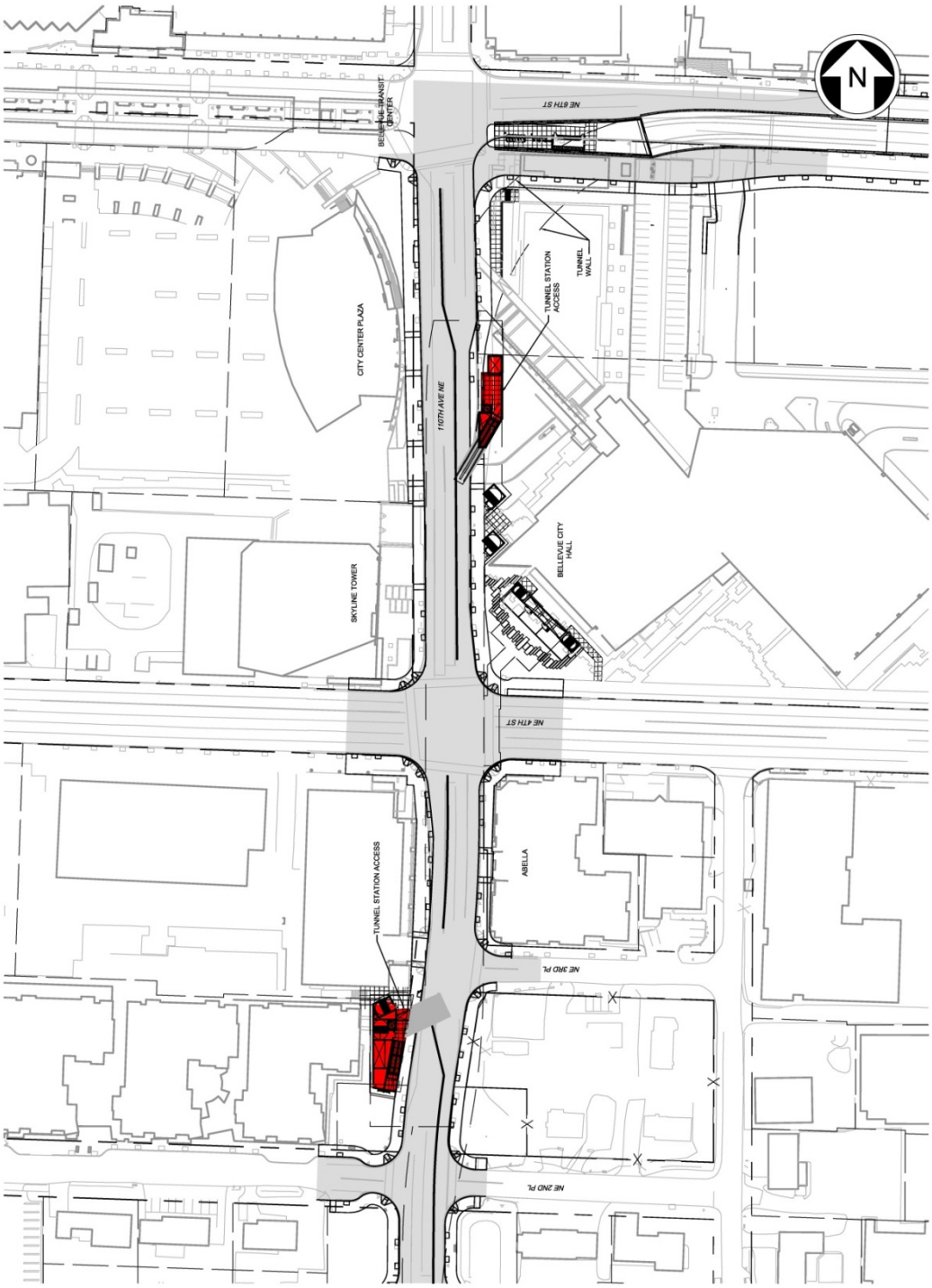


Figure 3.3c.1:
Downtown Station Design - Adopted Project

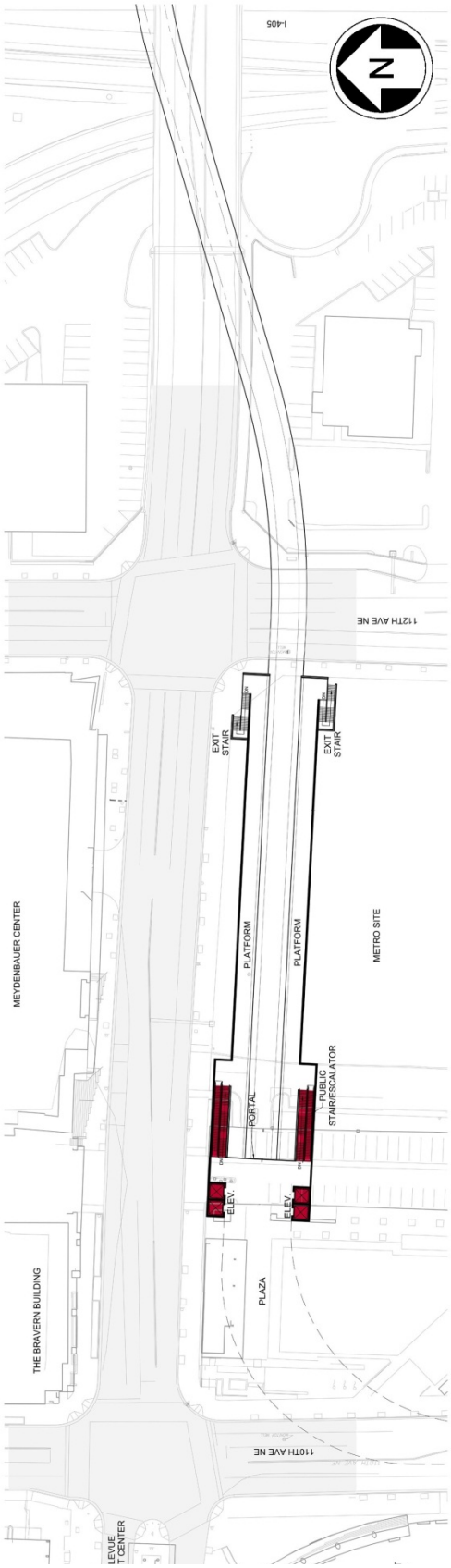


Figure 3.3c.2:
Relocate Station to NE 6th (Parallel)—3c Cost Savings Idea

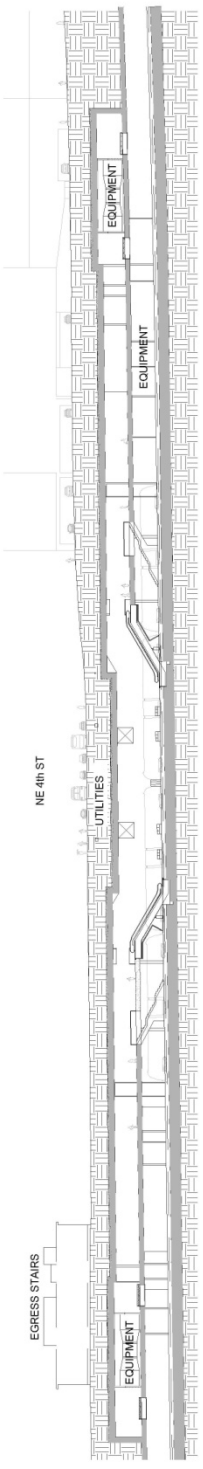


Figure 3.3c.3:
Downtown Station Design - Adopted Project

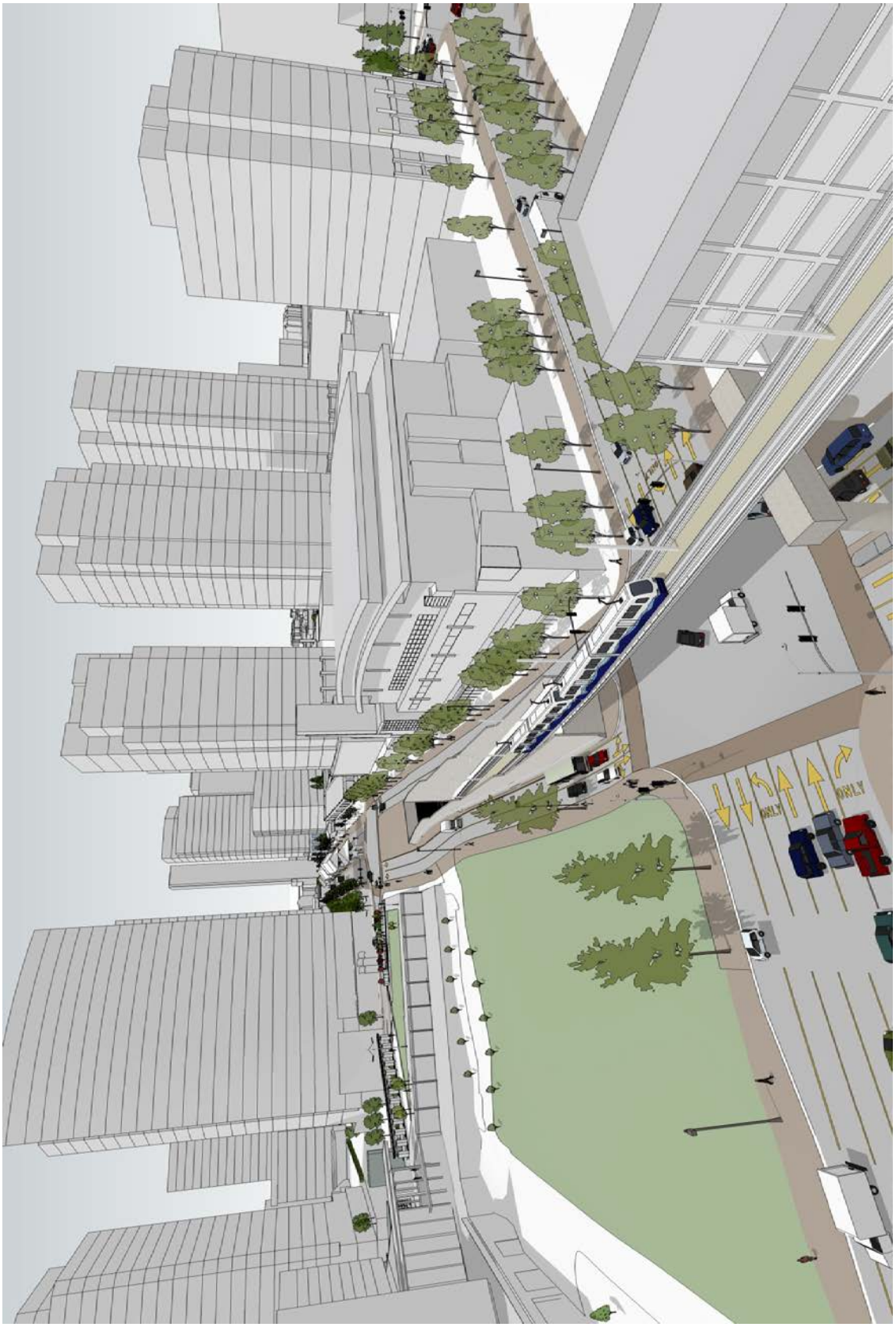


Figure 3.3c.4:
Downtown Station Design —3c Adopted Project

Figure 3.3c.5:
Relocate Station to NE 6th (Parallel)—3c Cost Savings Idea

3.3.4 Cost Savings Idea 3d – Relocate Station to City Hall/Metro Site (Diagonal)

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

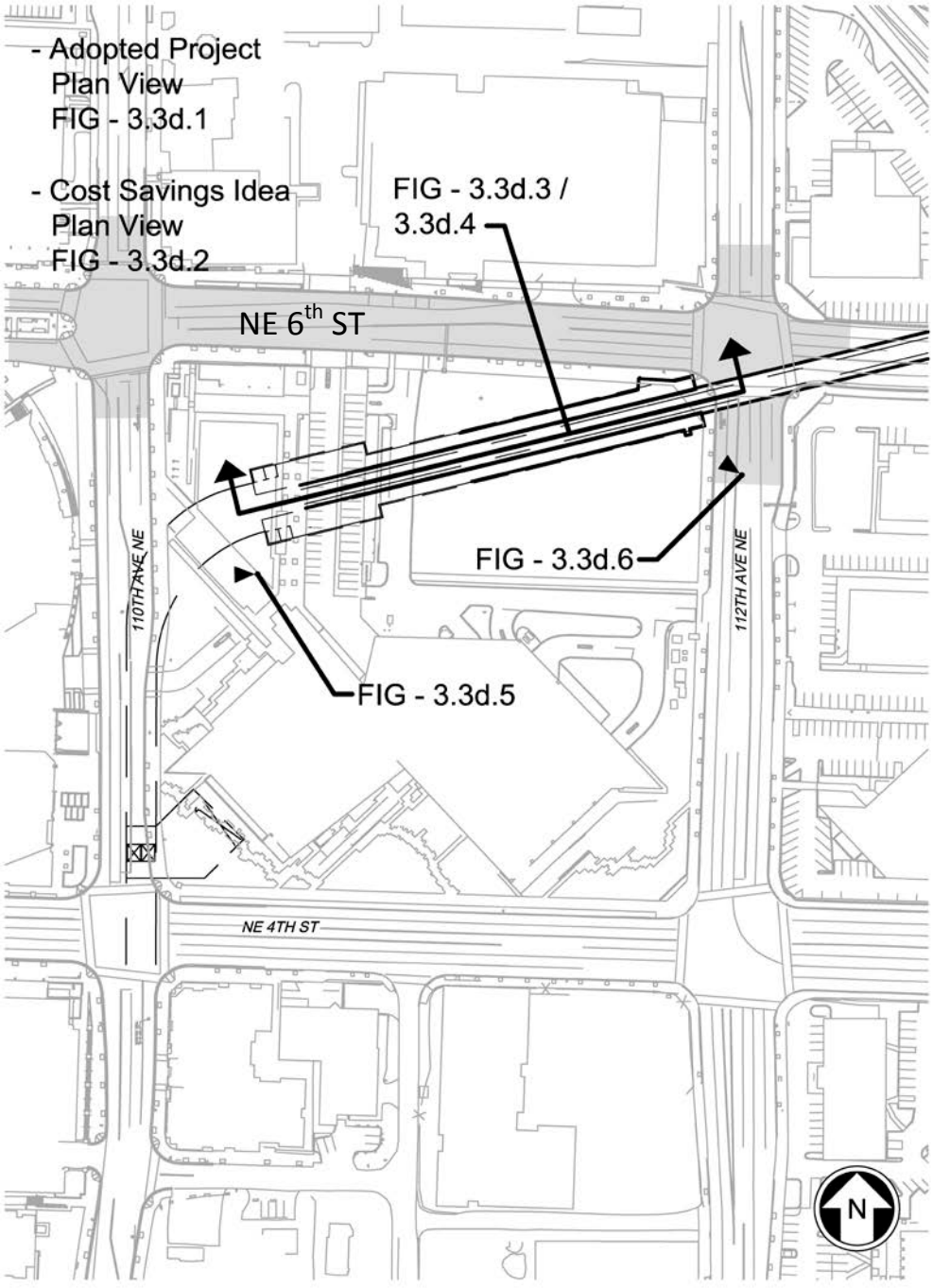


Figure 3.3d.0:
Relocate Station to City Hall/Metro Site—3d

Table 3-8
Cost Savings Evaluation: Downtown Station, Proposal – 3d

Cost Savings Evaluation Worksheet			
Description: Downtown Station Design			**Proposal: 3d**
Adopted Project: Provides a cut-and-cover tunnel and station with tracks side-by-side. Track spacing widens at the station to provide for a center platform and mezzanine above to transition passengers from center to side(s) of 110th Ave.NE.			
Cost Savings Idea: Relocate Station to City Hall/Metro Site (Diagonal) - Relocate the station to the City Hall Plaza in a shallower tunnel, displacing existing parking at this site. Why Consider this Alternative? • May shorten construction duration. • Reduces construction risk due to replacement of subway station with a partially elevated station. • Reduces construction risk due to a shallower tunnel. • Greater visibility of the station.			
	Adopted Project Estimate (2010 $ M)	**Cost Savings Idea Estimate (2010 $ M)**	**Range of Savings (2010 $ M)**
Cost Analysis	$188	$168	$14 to $23
Environmental Screening Results			
Resource (Potential Impacts)	**Adopted Project**	**Cost Savings Idea**	
LRT Operations	Horizontal and vertical alignment design requires 20 MPH operations due to geometry.	Horizontal and vertical alignment design requires 10 MPH operations due to horizontal radius near 150'. This will require approval of a design deviation by Sound Transit.	
LRT Access and Ridership	6,000 daily boardings at Bellevue Transit Center Station in year 2030. Access to tunnel provided through two entrances	Slightly lower ridership from single station entrance. One station access at NE 6th St.	
Jobs Within 5 Minute Walk Radius Residents Within 5 Minute Walk Radius	36% 14%	33% 7%	
Traffic (Mobility)			

Resource (Potential Impacts)	Adopted Project	Cost Savings Idea
• Traffic Impacts	Congestion impact requiring mitigation at NE 4th St. and 108th Ave NE.	Same as Adopted Project. Relocates City Hall parking garage.
• Vehicle Access	Maintains four travel lanes on 110th Ave. NE	Maintains four lanes on 110th Ave. NE. Maintains five lanes on NE 6th St. NE 6th St. City hall parking garage removed. Limits access to future development on Metro Site.
• Pedestrian Access	Maintains residential and business access.	Same as Adopted Project. May affect access to Metro Site
Noise and Vibration	Moderate noise and groundborne noise impacts from elevated guideway on NE 6th St. that can be mitigated. No vibration impacts.	Added bell noise from at-grade station, mitigated with building sound insulation. Increased vibration and groundborne noise to Bellevue City Hall from reconfigured tunnel that could be mitigated.
Visual Appearance	No impacts.	Greater visibility of station and removal of parking garage structure.
Other Environmental Elements Affected by the Proposed Change		
• Property Impacts	Minor acquisition for station entrances.	Increased permanent property acquisition including King County Metro Site and Bellevue City Hall parking garage and police facilities.
• Parklands	Minor acquisition of Pocket Parks for south station entrance.	No impact due to relocated station.
Schedule Risk	N/A	Lower.

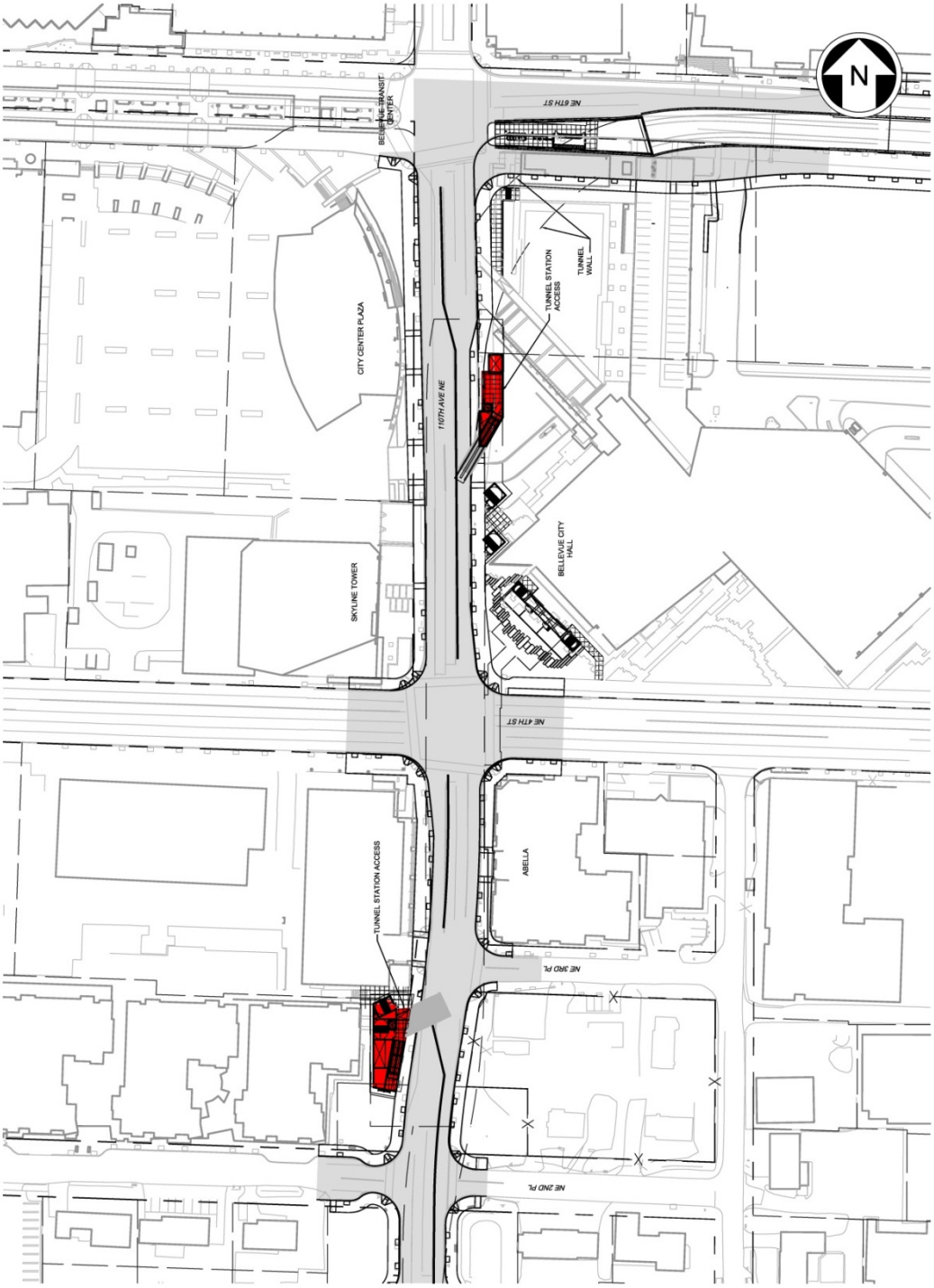


Figure 3.3d.1:
Downtown Station Design - Adopted Project

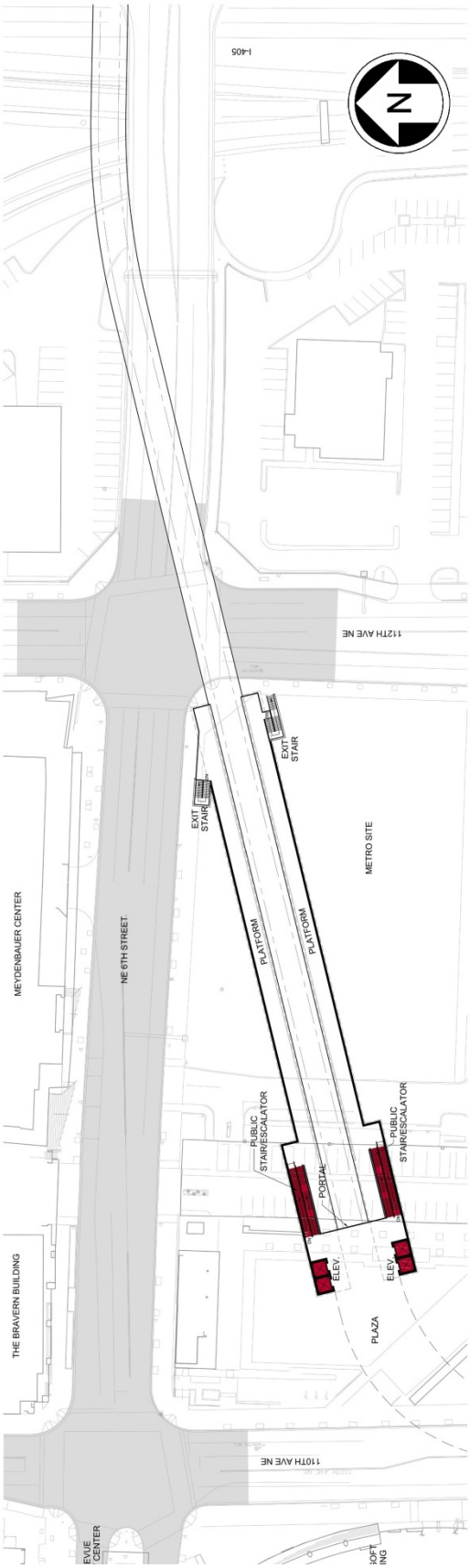


Figure 3.3d.2:
Relocate Station to City Hall/Metro Site (Diaganol)—3d Cost Savings Idea

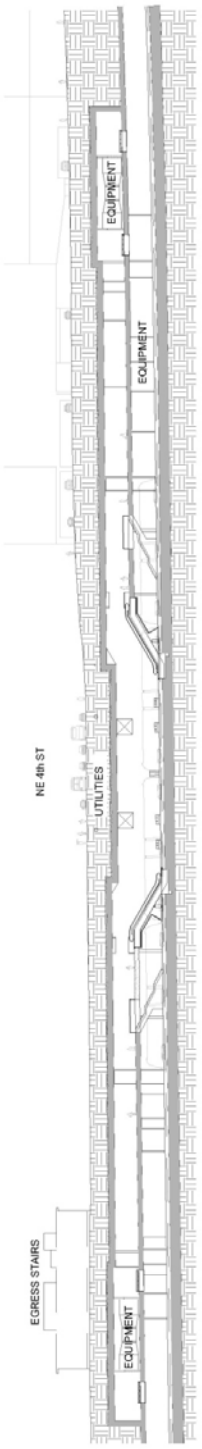


Figure 3.3d.3:
Downtown Station Design - Adopted Project

Figure 3.3d.4:
Relocate Station to City Hall/Metro Site (Diagonal)—3d Cost Savings Idea

3.3.5 Walk Distance Analysis of Downtown Station Cost Savings Ideas

Table 3-9
Downtown Station Design

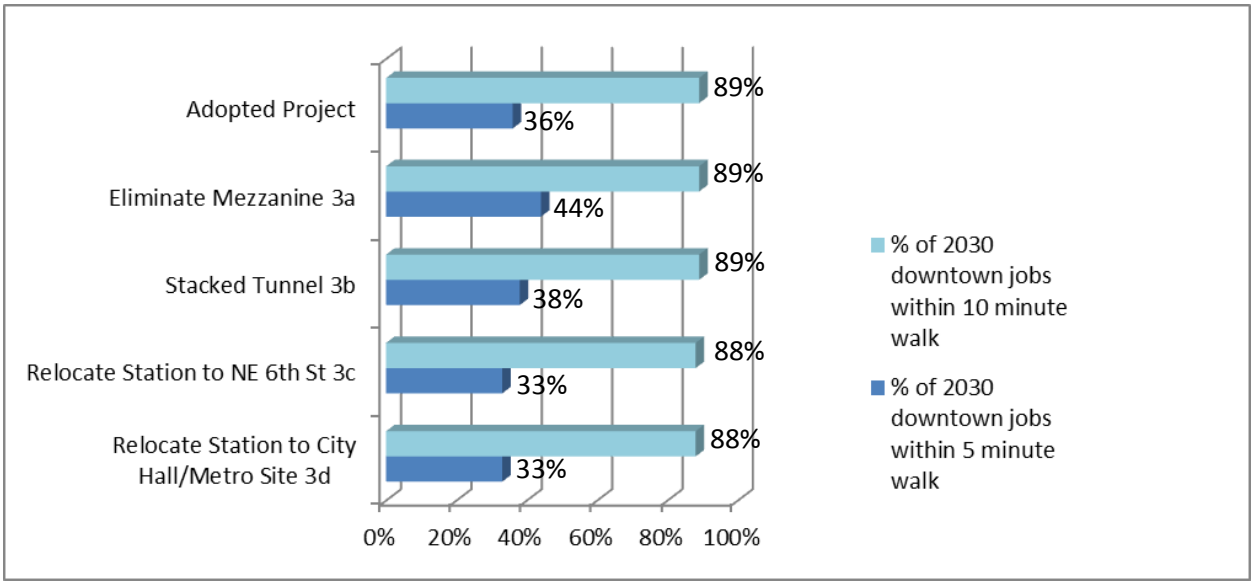
3a. Eliminate Mezzanine, Station Entrance in Outer Lane of 110th Ave. (Allows Station and Tunnel to Be Shallower)
3b. Construct A Stacked Tunnel Configuration With Entrances in the Outer Lane of 110th Ave. (Allows Tunnel to Be Narrower)
3c. Relocate Station to NE 6th (Parallel)
3d. Relocate Station to the City Hall/Metro Site (Diagonal)

A walk distance analysis was conducted by the City of Bellevue to illustrate the share of predicted jobs and residents who would be within a five- and ten-minute walk distance of the Bellevue Transit Center (BTC) Station. Pedestrian capture area maps were prepared for the Adopted Project and four cost savings ideas. The maps identify the parcels that are within the 5- and 10-minute walk distance (or ¼ mile and ½ mile, respectively) of the BTC Station.

The analysis illustrate that the stations with two entrances, which include the Adopted Project, Eliminate Mezzanine 3a and Stacked Tunnel 3b, have the largest pedestrian capture areas as compared to the Relocate Station to NE 6th St 3c and Relocate Station to City Hall/Metro Site 3d ideas.

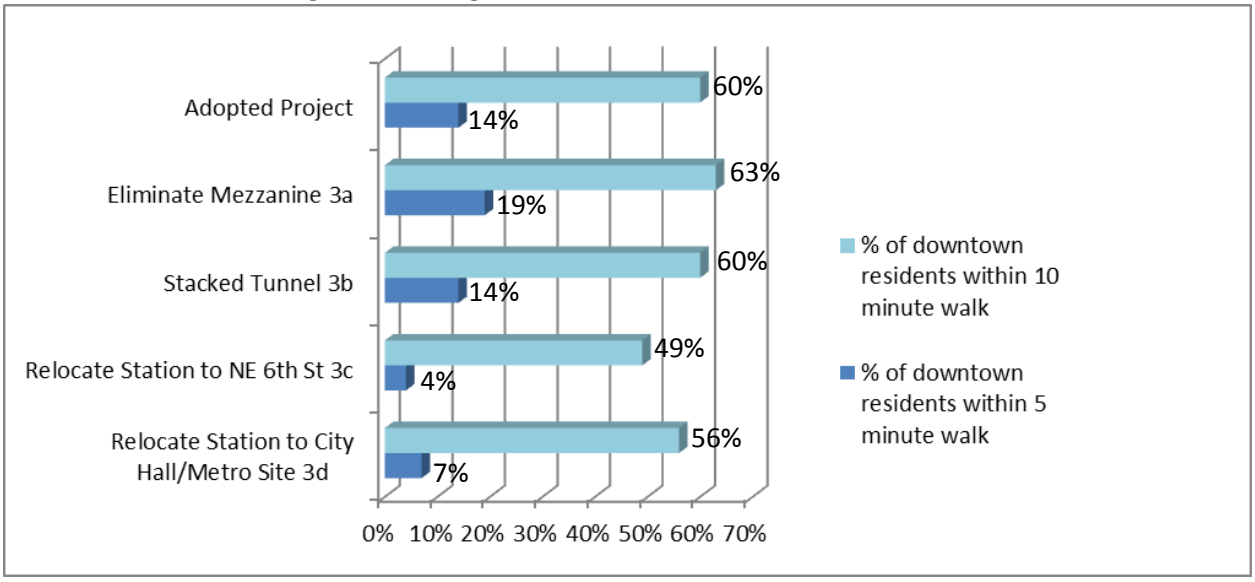
The walk distance analysis also included a review of the percent share of future jobs and residents that would be within walking distance of the BTC Station. The analysis shows that the Eliminate Mezzanine 3a idea would capture the largest share of 2030 jobs that would be located within 5-minute walk distance (44 percent) of the station. The Adopted Project and remaining ideas are similar, ranging from 33 percent to 38 percent. Future jobs that would be located within 10-minute walk distance are similar for all options (88 percent to 89 percent). The results are shown in Table 3.3.2 as follows:

Table 3-10
Downtown Station Design Cost Savings Ideas – Walk Access to Jobs in 2030



The analysis shows that the Eliminate Mezzanine 3a idea would capture the largest share of the future residents who would be located within 5-minute walk distance of the station (19 percent). The Adopted Project and remaining cost savings ideas capture a lower share, ranging from 4 percent to 14 percent. The share of future residents who would be located within 10-minute walk distance of the station is highest for the Eliminate Mezzanine 3a. The Adopted Project and Stacked Tunnel 3b would capture a slightly lower share (60 percent to 63 percent). The Relocate Station to NE 6th St 3c and Relocate Station to City Hall/Metro Site 3d ideas captures the least percent share of the residents at 49 percent and 56 percent, respectively. The results are shown in Table 3.3.2 as follows:

Table 3-11
Downtown Station Design Cost Savings Ideas – Walk Access for Residents in 2030



The entire Walk Distance Analysis Report including pedestrian capture maps can be found in Appendix A of this Cost Savings Report.

3.4 Downtown Tunnel Design

3.4.1 Cost Savings Idea 4a – Retained Cut Main St. to NE 2nd St.

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

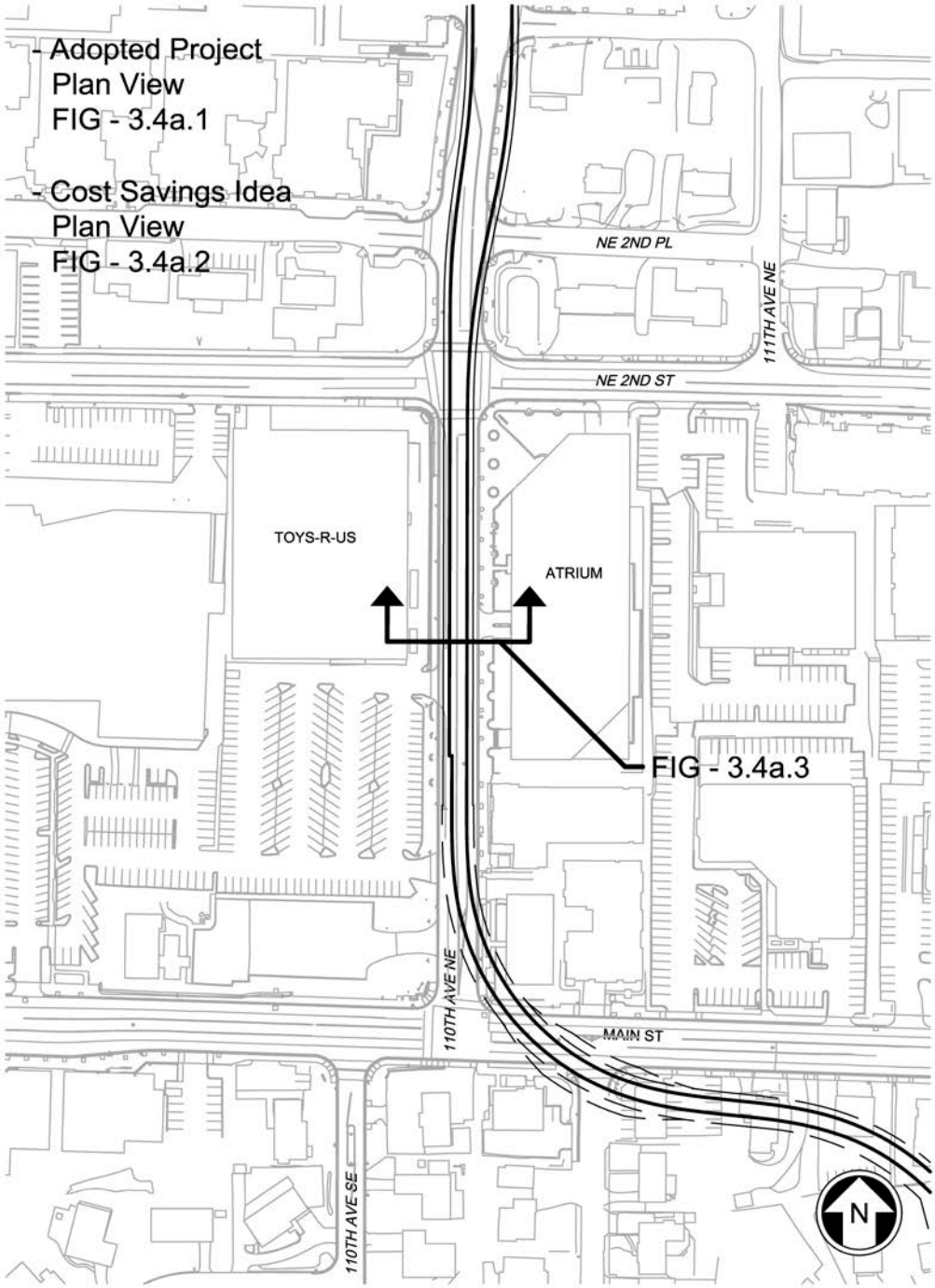


Figure 3.4a.0:
Retained Cut Main St. to NE 2nd St.—4a

Table 3-12
Cost Savings Evaluation: Downtown Tunnel, Proposal – 4a

Cost Savings Evaluation Worksheet			
Description: Downtown Tunnel Design			**Proposal: 4a**
Adopted Project: The Adopted Project includes a cut and cover tunnel and station from south of Main St. to NE 6th St. along 110th Ave. NE as the LRT alignment proceeds through downtown Bellevue. The roadway configuration of 110th Ave. NE would remain in its current arrangement upon completion of tunnel and station construction.			
Cost Savings Idea: Retained cut from Main St to NE 2nd St - This idea would replace the portion of the cut-and-cover tunnel between Main St. and NE 2nd St. with a retained cut structure. The retained cut structure would include an opening along 110th Ave. NE of approximately 26 feet in width. The intersections of Main St. and NE 2nd St. would be reconfigured to channel vehicular traffic around the retained cut opening along 110th Ave. NE. Wider travel lanes would be required on either side of the retained cut opening to provide for emergency vehicle access. Why Consider this Alternative? • May reduce tunnel ventilation requirements.			
	Adopted Project Estimate (2010 $ M)	**Cost Savings Idea Estimate (2010 $ M)**	**Range of Savings (2010 $ M)**
Cost Analysis	Upon Further Analysis, No Savings		
Environmental Screening Results			
Resource (Potential Impacts)	**Adopted Project**		**Cost Savings Idea**
LRT Operations	Horizontal and vertical alignment design requires 20 mph operations due to geometry.		Same as Adopted Project.
LRT Access and Ridership	N/A		N/A
Traffic (Mobility)			
• Traffic Impacts	Congestion impacts requiring Potential mitigation at NE 4th St. and 108th Ave NE		Same as Adopted Project.

Resource (Potential Impacts)	Adopted Project	Cost Savings Idea
• Vehicle Access	Maintains current 110th Ave. NE access and roadway intersection configurations.	Widen 110th Ave. NE between Main St. and NE 2nd St. to accommodate retained cut opening and wider travel lanes required for emergency vehicle access. Right in – right out driveway access restriction between Main St. and NE 2nd St. Requires non-standard signalized intersection at Main St. and 110th Ave. NE.
• Pedestrian Access	Maintains current 110th Ave. NE sidewalk access.	Maintains current 110th Ave. NE sidewalk access.
Noise and Vibration	No impacts.	Increased noise from retained cut alignment to apartments on the east side of 110th Ave. NE, may be mitigated by using absorbent material on retained cut walls.
Visual Appearance	No impacts	Greater visibility from retained cut alignment.
Other Environmental Elements Affected by the Proposed Change		
• Property Impacts	Property acquisitions related to tunnel.	New property acquisitions from larger footprint.
Schedule Risk	N/A	Lower.

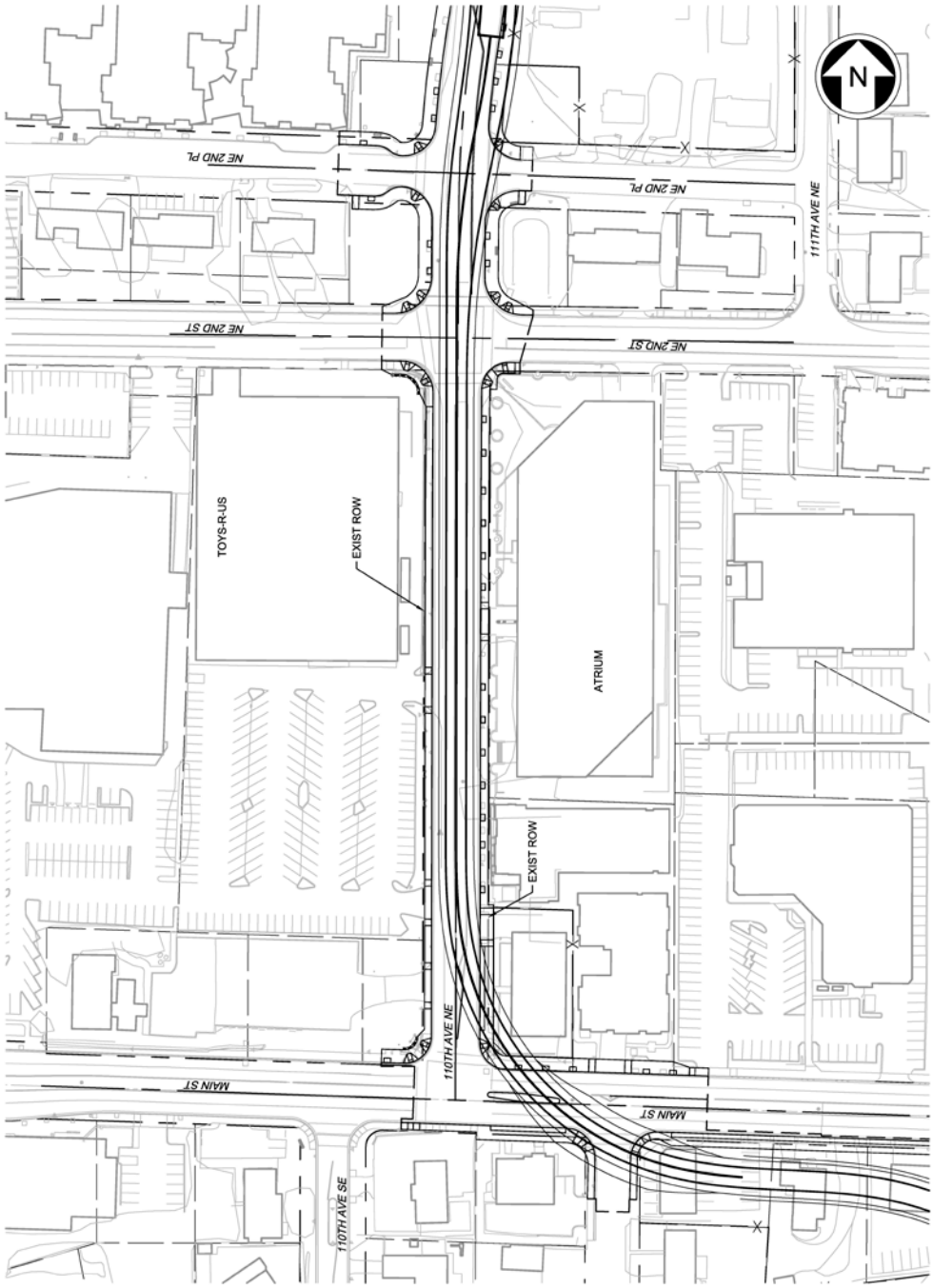


Figure 3.4a.1:
Downtown Tunnel Design - Adopted Project

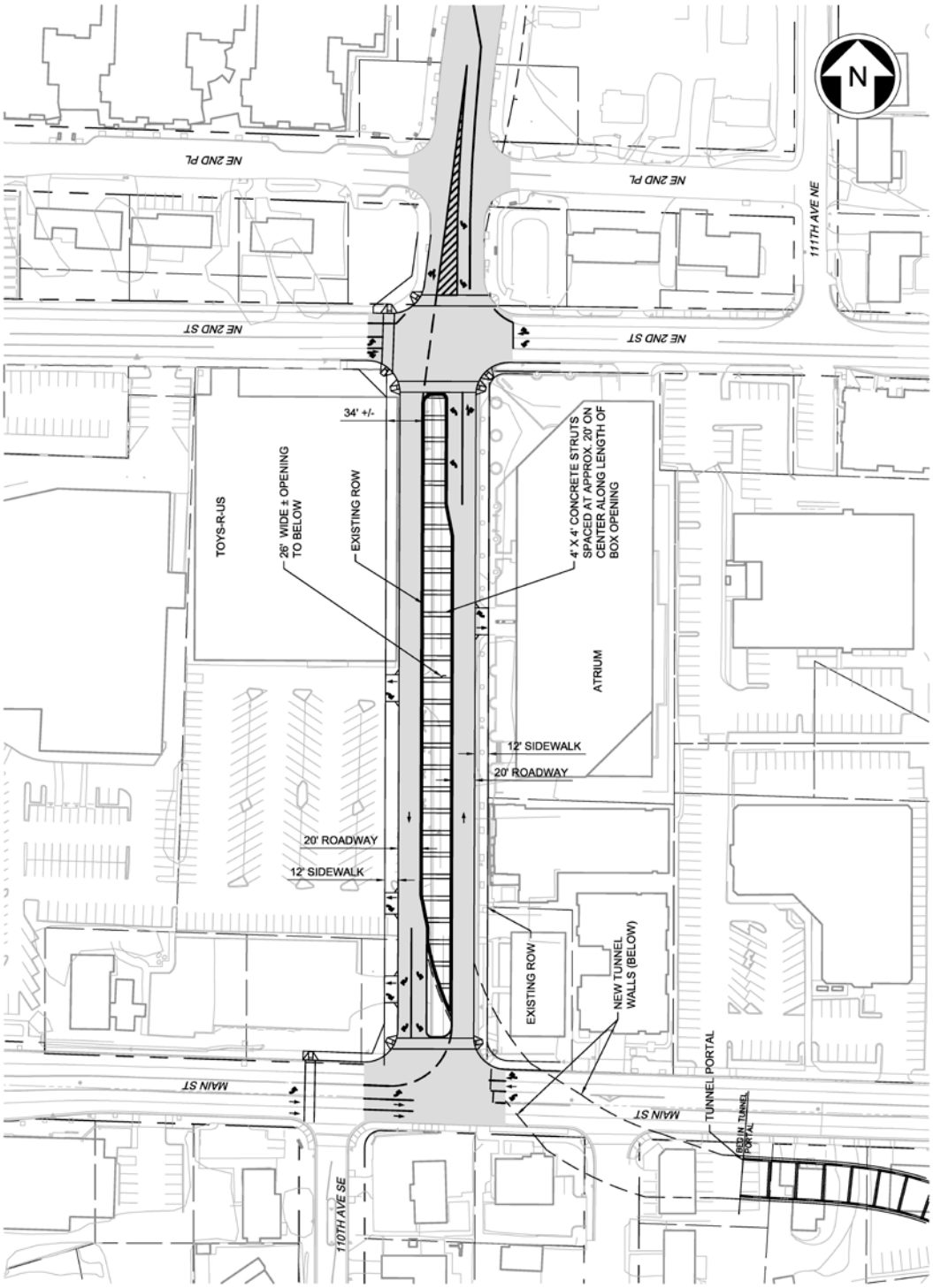


Figure 3.4a.2:
Retained Cut from Main St. to NE 2nd St.—4a Cost Savings Idea

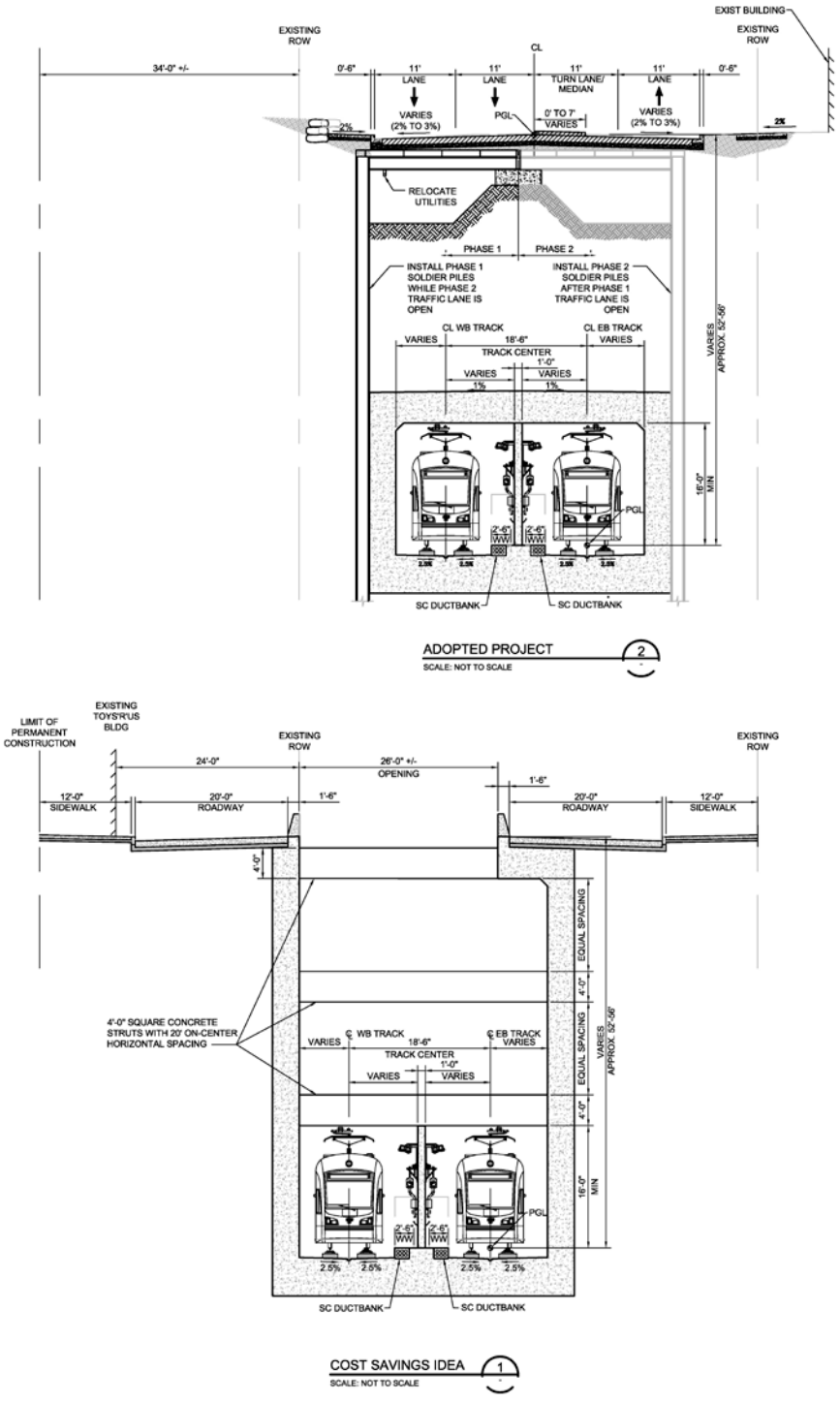


Figure 3.4a.3:
Retained Cut from Main St. to NE 2nd St.—Adopted Project Compared to Cost Savings Idea

3.5 NE 16th St. Cross-Section

3.5.1 Cost Savings Idea 5a – Build Two-way Road on North Side of Light Rail Alignment

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

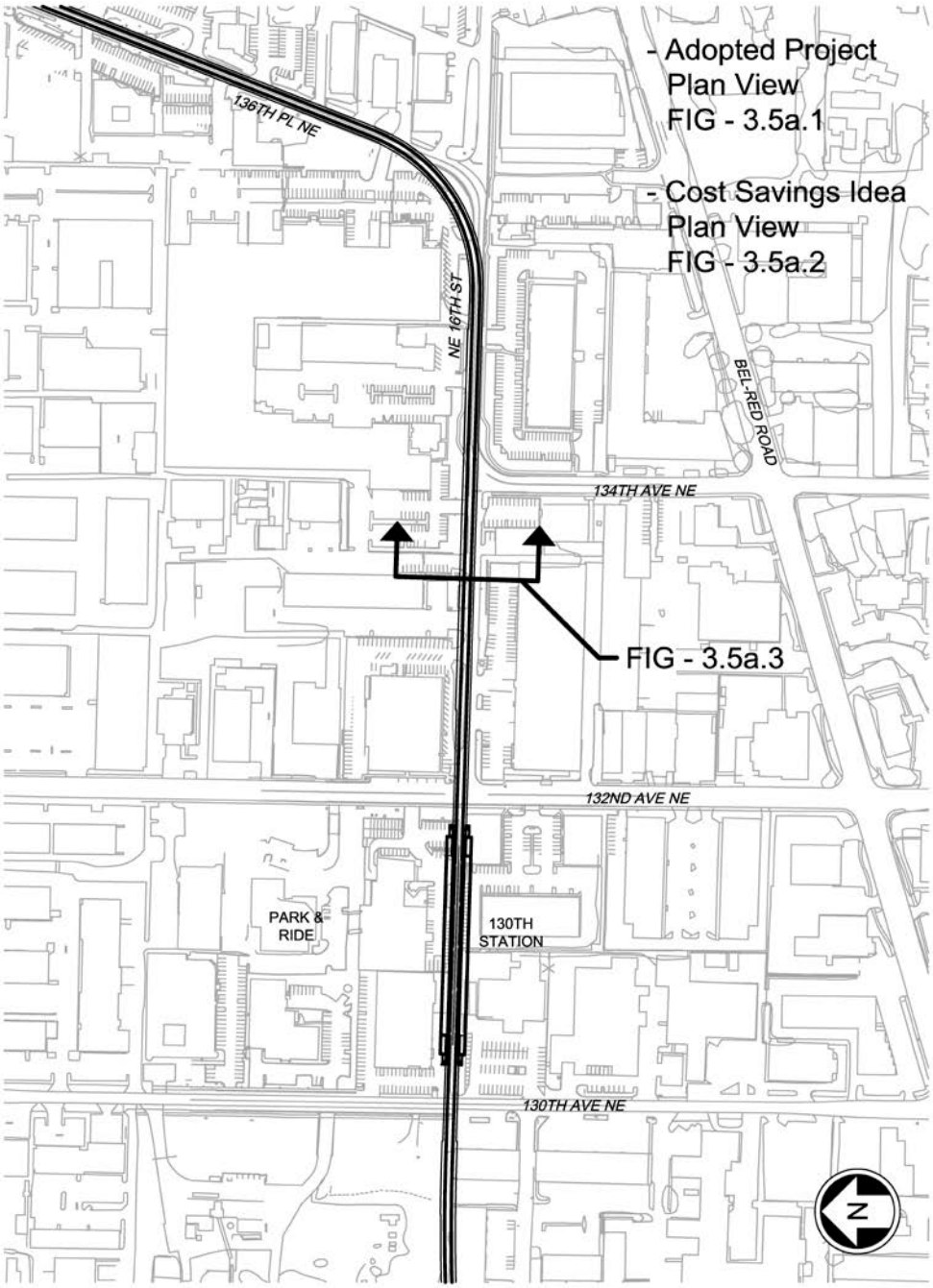


Figure 3.5a.0:
Build Two-Way Road on North Side of Light Rail Alignment—5a

Table 3-9
Cost Savings Evaluation: NE 16th St, Proposal – 5a

Cost Savings Evaluation Worksheet			
Description: Build Two-Way Road on North Side of Light Rail Alignment			**Proposal: 5a**
Adopted Project: Provides a bifurcated roadway cross-section on NE 16th St. The north side of the roadway is elevated relative to the light rail guideway and south side of the roadway.			
Cost Savings Idea: Build two-way road on north side of light rail alignment - This Cost Savings Idea minimizes the roadway section and uses an embedded light rail guideway to improve fire access width, eliminating throw-away walls, reducing the scope of drainage improvements and overall need for right-of-way in this area. Why Consider this Alternative? • Total road/light rail width gets narrower. • Reduces the amount of road construction • Supports a phased implementation of a comprehensive plan for NE 16th St.			
	Adopted Project Estimate (2010 $ M)	**Cost Savings Idea Estimate (2010 $ M)**	**Range of Savings (2010 $ M)**
Cost Analysis	**Upon Further Analysis, No Savings**		
Environmental Screening Results			
Resource (Potential Impacts)	**Adopted Project**	**Cost Savings Idea**	
LRT Operations	Complex but within design criteria manual horizontal and vertical geometry.	Minimal to no change.	
LRT Access and Ridership	N/A	N/A	
Traffic (Mobility)			
• Traffic Impacts	Intersections operate acceptably along NE 16th St. and 136th Place NE.	Worse intersection operations and safety considerations at NE 16th St./136th Place NE intersection.	
• Vehicle Access	North roadway at a higher level than light rail and south roadway. Right in, right out on each side of LRT alignment.	Roadway/light rail on one level - Restricted access to properties on the south side – improves access for properties north of the alignment.	
• Pedestrian Access	Full access provided to adjacent properties on both sides of NE 16th St.	Same as Adopted Project.	

Resource (Potential Impacts)	Adopted Project	Cost Savings Idea
Noise and Vibration	No impacts.	Increased traffic noise from changed roadway configuration that could be mitigated
Visual Appearance	At-grade section in center of traffic lanes with north traffic lanes higher than the southern lanes.	At-grade section on south side of two-way traffic lanes.
Other Environmental Elements Affected by the Proposed Change		
• Property Impacts	Multiple partial acquisitions along NE 16th St. between 132nd Ave. NE and 136th Place NE.	One likely additional business displacement. Reduced level of acquisitions from narrower light rail and road right-of-way.
Schedule Risk	N/A	Lower.

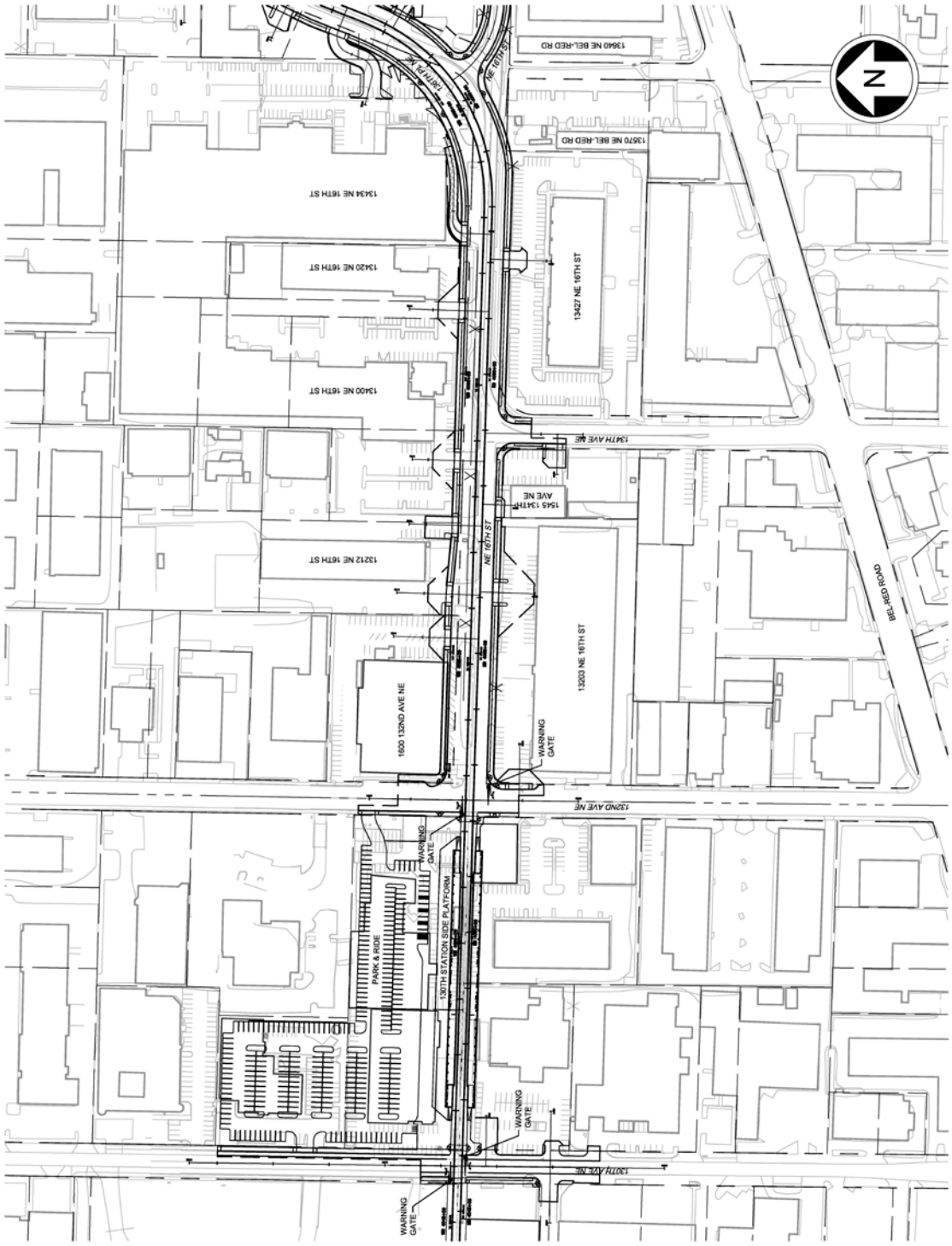


Figure 3.5a.1:
NE 16th St. Cross-Section - Adopted Project

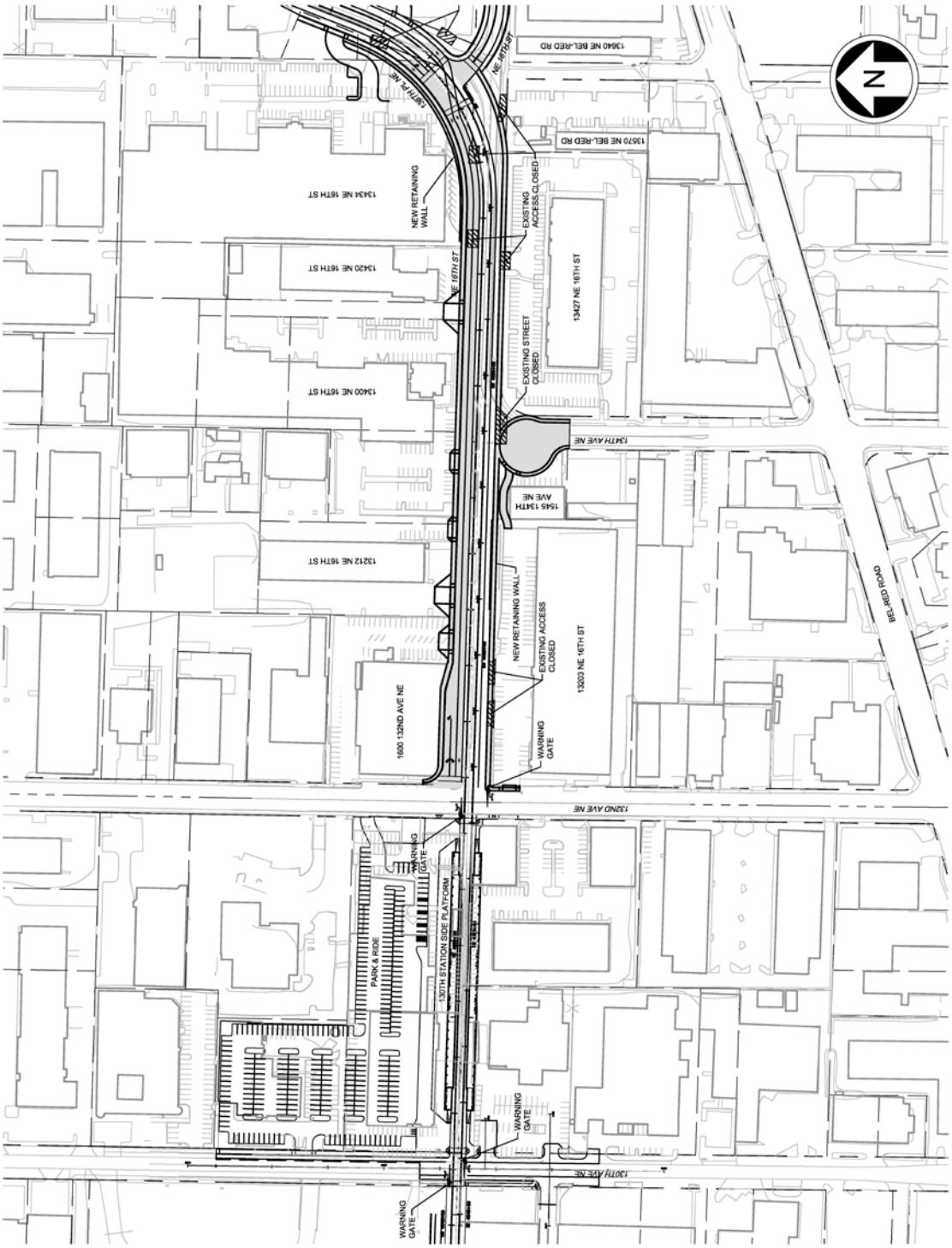


Figure 3.5a.2:
Build Two-Way Road on North Side of Light Rail Alignment—5a Cost Savings Idea

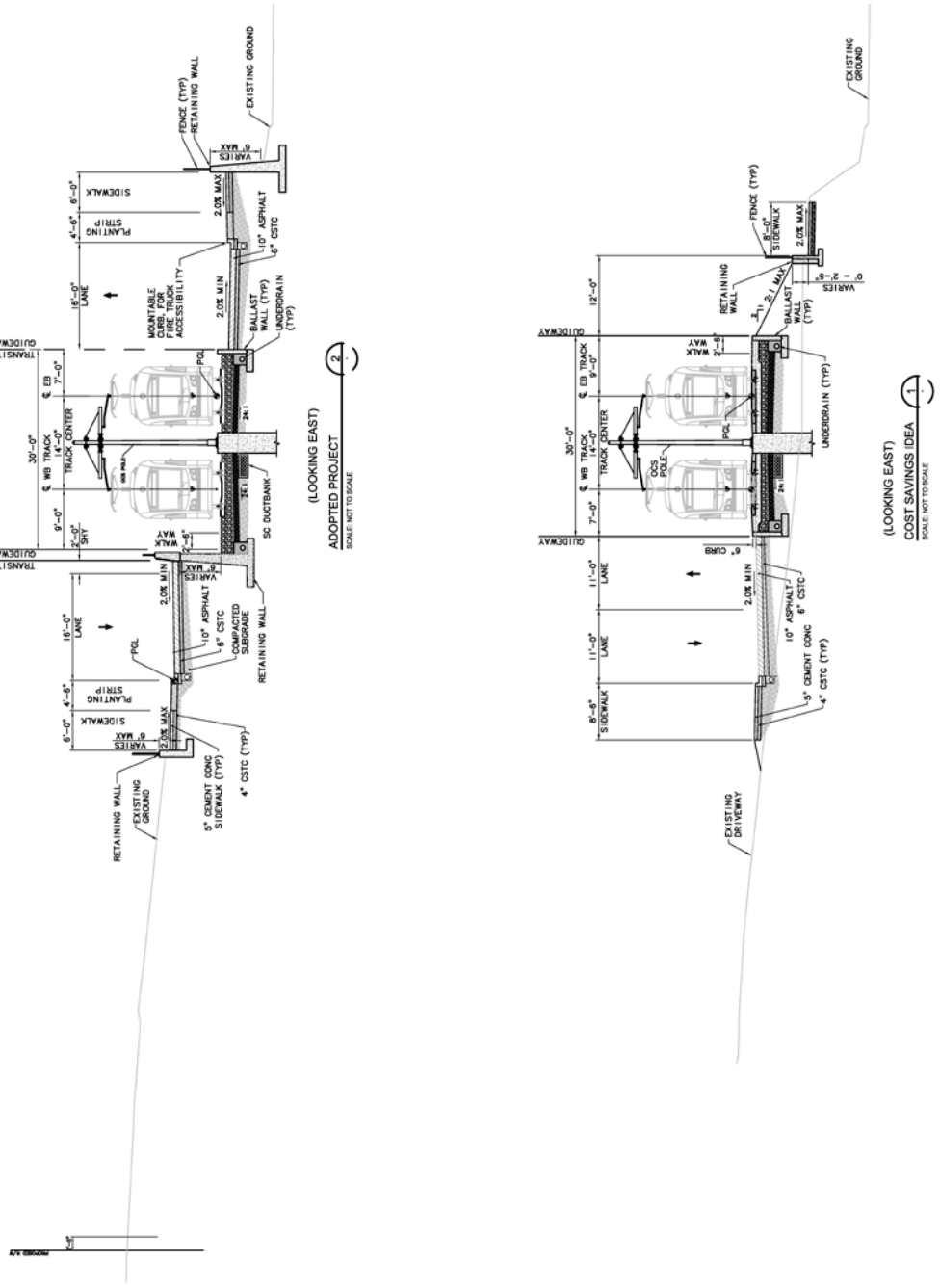


Figure 3.5a.3:
NE 16th St. Cross-Section - Adopted Project Compared to Cost Savings Idea

3.5.2 Cost Savings Idea 5b – City of Bellevue Configuration of NE 16th St.

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

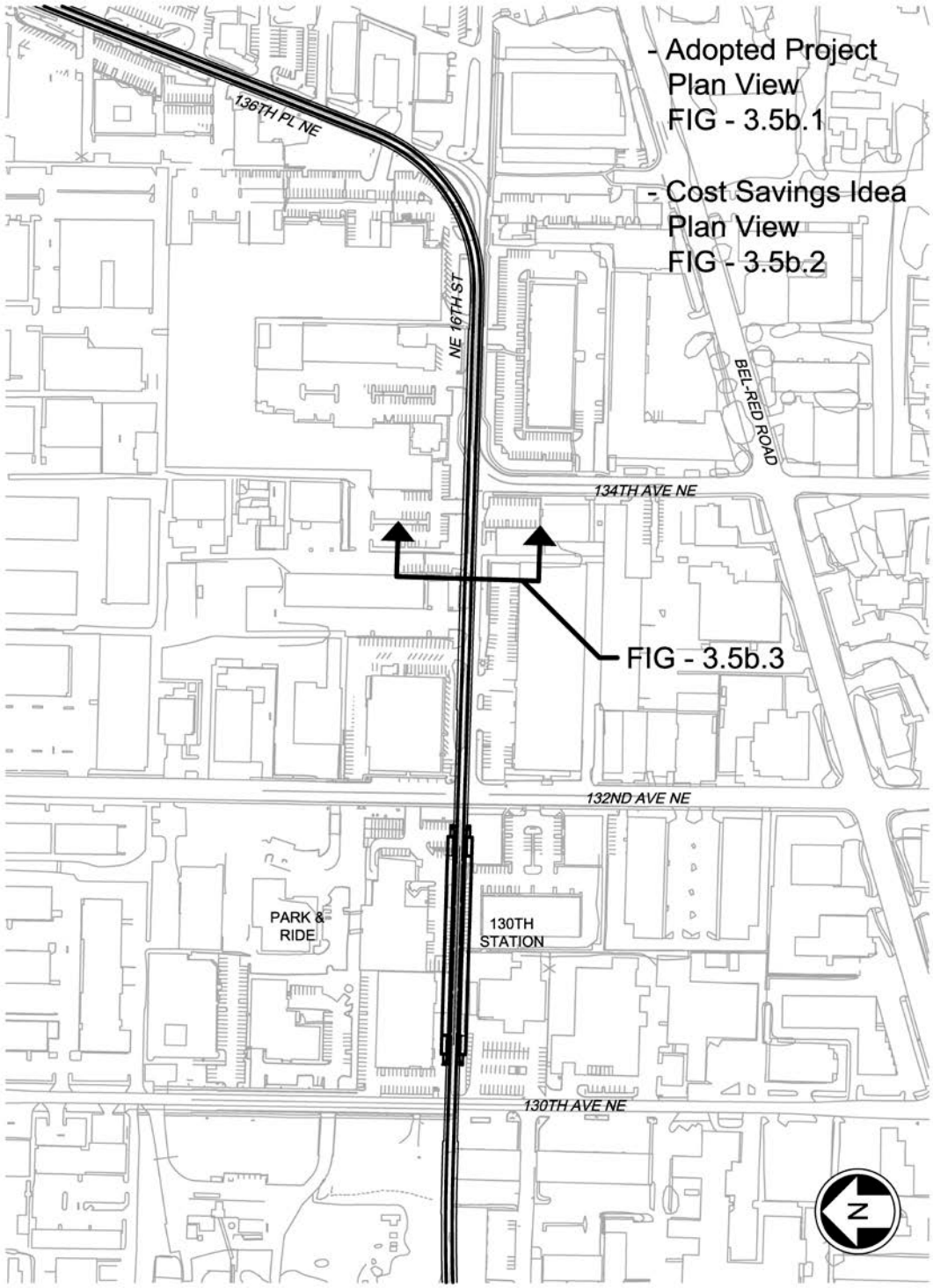


Figure 3.5b.0:
Alternative Configuration of NE 16th St.—5b

Table 3-14
Cost Savings Evaluation: Alternative Configuration of NE 16th – 5b

Cost Savings Evaluation Worksheet			
Description: Alternative Configuration of NE 16th			**Proposal: 5b**
Adopted Project: Provides a bifurcated roadway cross-section on NE 16th St. The north side of the roadway is elevated relative to the light rail guideway and south side of the roadway.			
Cost Savings Idea: Alternative Configuration of NE 16th St. - This alternative cross-section provides a bifurcated roadway cross-section. The north and south roadways are vertically aligned and positioned with the LRT. This configuration is more suitable for the future development of the area. Why Consider this Alternative? • Reduces future cost to build the roadway. • Consist with city plans. • Accommodates future development opportunities, and the future extension of 134th Ave. NE.			
	Adopted Project Estimate (2010 $ M)	**Cost Savings Idea Estimate (2010 $ M)**	**Range of Savings (2010 $ M)**
Cost Analysis	**Upon Further Analysis, No Savings**		
Environmental Screening Results			
Resource (Potential Impacts)	**Adopted Project**	**Cost Savings Idea**	
LRT Operations	Complex but within design criteria manual horizontal and vertical geometry.	Minimal to no change.	
LRT Access and Ridership	N/A	N/A	
Traffic (Mobility)			
• Traffic Impacts	Intersections operate acceptably along NE 16th St. and 136th Place NE.	Improvement over adopted project due to more opportunities for fuller street grid.	
• Vehicle Access	North roadway at a higher level than light rail and south roadway. Right in, right out on each side of LRT alignment.	Roadway and light rail on one level. Provides access to properties on both sides. Right-in and right-out on each side of LRT alignment.	
• Pedestrian Access	Full access provided to adjacent properties on both sides of NE 16th St.	Improvement over adopted project due to more opportunities for a fuller pedestrian network.	
Noise and Vibration	No impacts.	Same as Adopted Project.	

Resource (Potential Impacts)	Adopted Project	Cost Savings Idea
Visual Appearance	At-grade section in center of traffic lanes with north traffic lanes higher than the southern lanes.	LRT and traffic lanes are all at the same level.
Other Environmental Elements Affected by the Proposed Change		
• Property Impacts	Multiple partial acquisitions along NE 16th St. between 132nd Ave. NE and 136th Place NE.	Same as Adopted Project.
Schedule Risk	N/A	Lower.

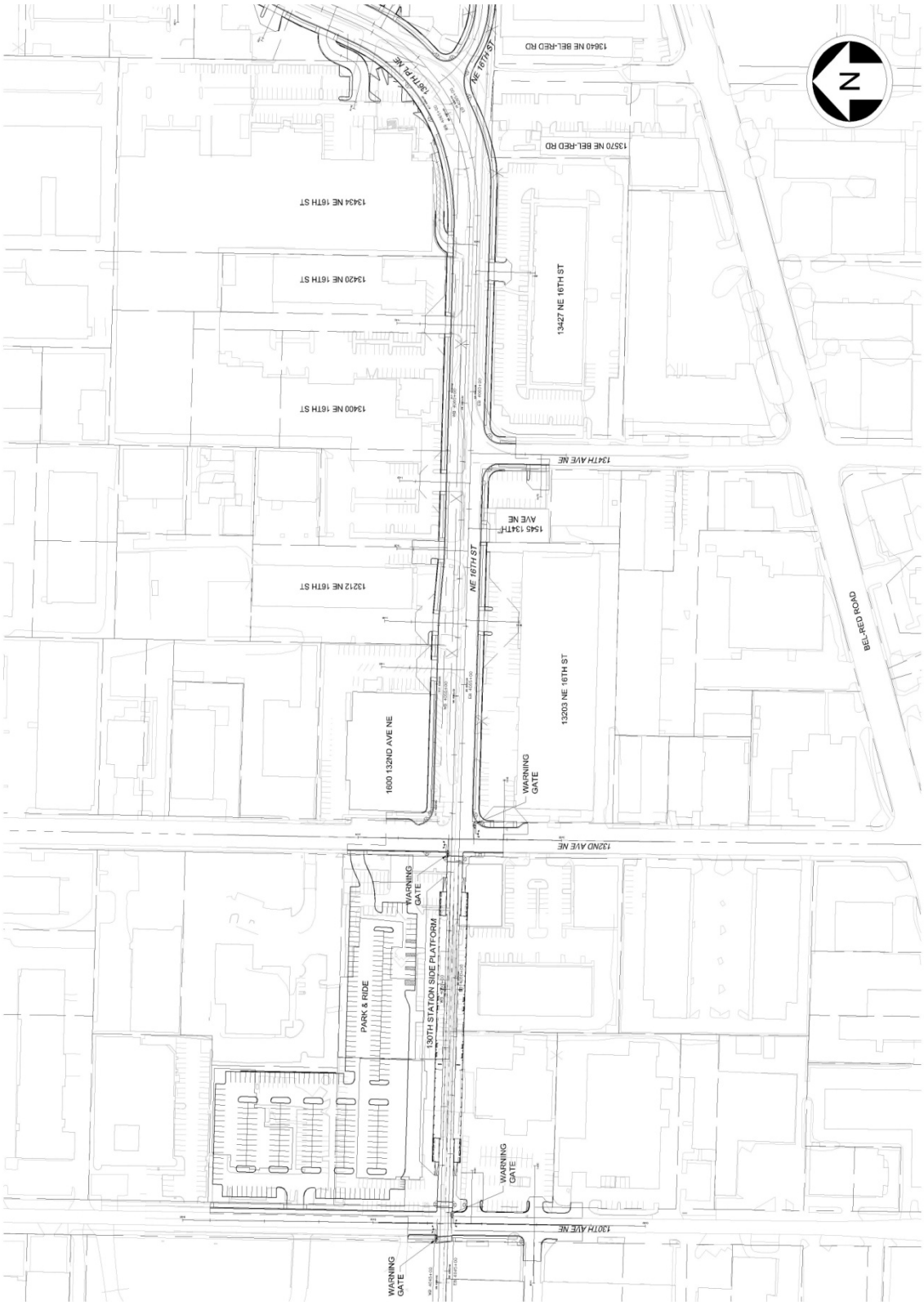


Figure 3.5b.1:
NE 16th St. Cross-Section - Adopted Project

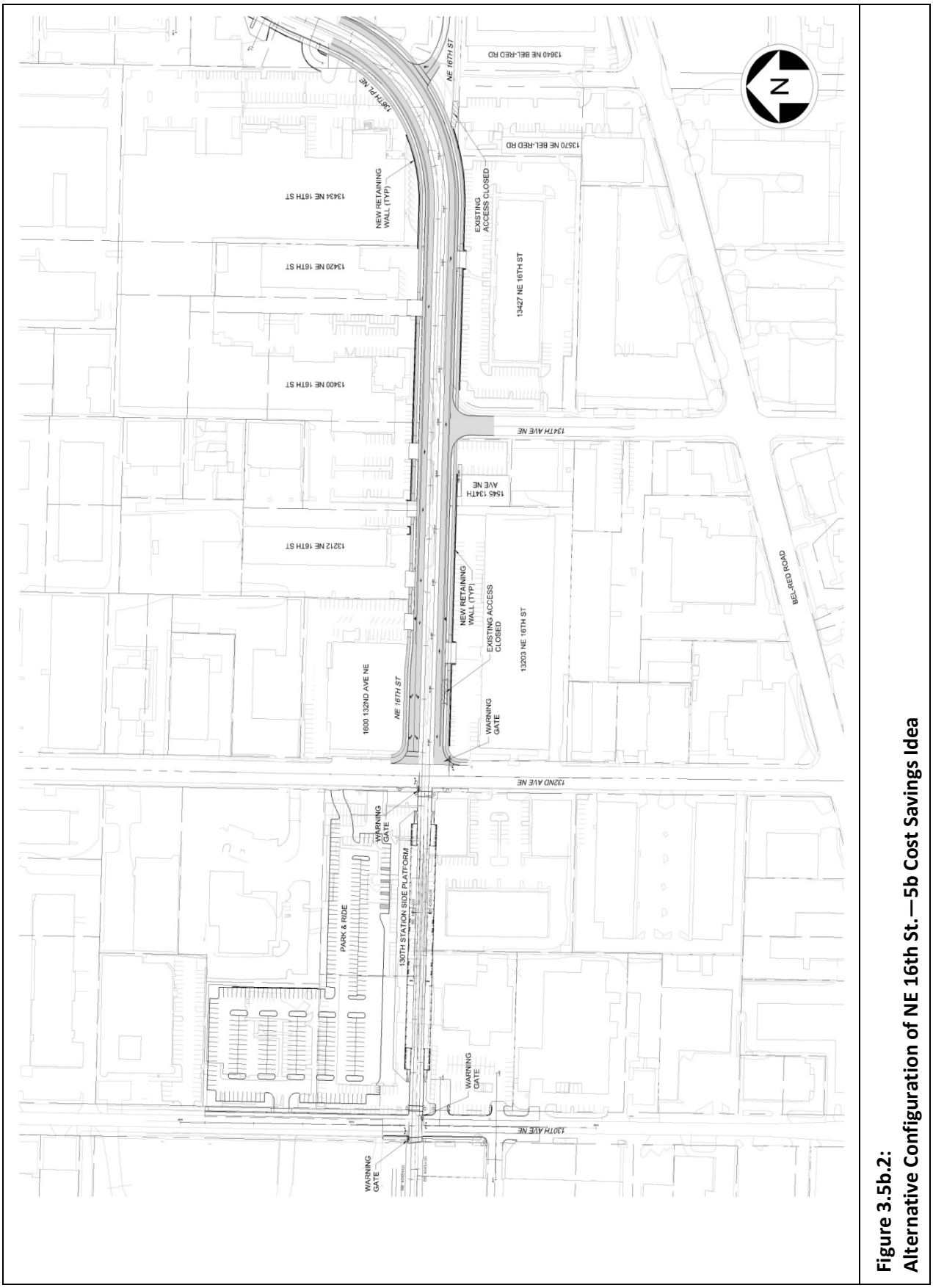


Figure 3.5b.2:
Alternative Configuration of NE 16th St.—5b Cost Savings Idea

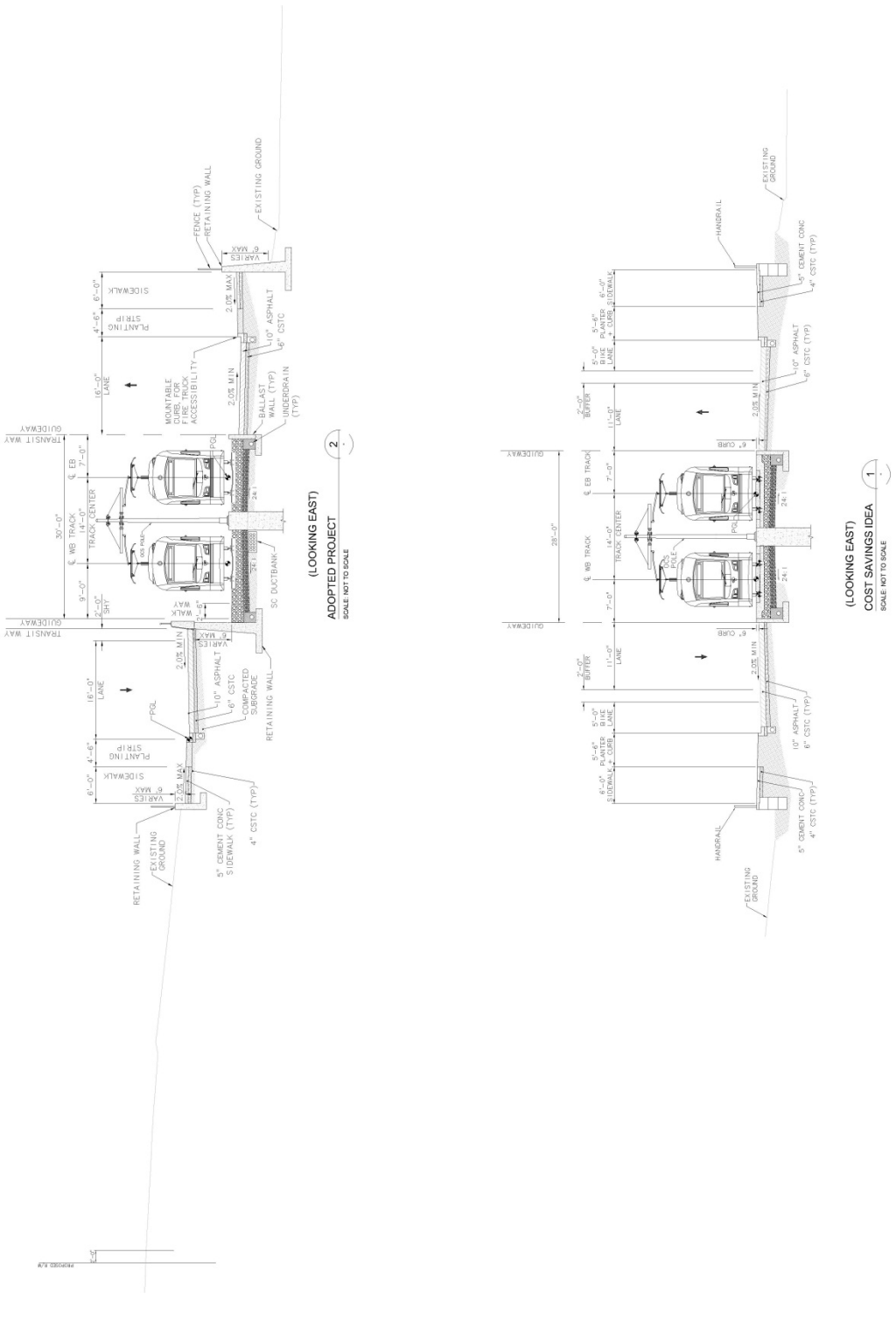


Figure 3.5b.3:
Alternative Configuration of NE 16th St.—5b Adopted Project Compared to Cost Savings Idea

4.0 Cost Savings Ideas – Previously Reviewed and Not Selected

The following are Cost Savings Ideas previously reviewed and not selected. These ideas are not planned to be developed any further.

Table 4-1
Cost Savings Ideas Reviewed But Not Selected

Description
1. South Bellevue Way Alignment
a. Utilize Bellevue HOV Ramps to Exit I-90
b. At Grade Center Running Alignment on Bellevue Way and 112th Ave. SE
2. 112th Ave. SE Design Modifications
a. At-Grade Crossing of SE 15th St.

5.0 Summary of Public Involvement

On April 26, 2012, Sound Transit and the City co-hosted the first of two public open houses to introduce Cost Savings Ideas and provide an opportunity for public review and comment. The open house was held from 4:00 to 7:00 p.m. at Bellevue City Hall. Over 200 people attended the open house to learn about the Cost Savings Ideas and provide feedback. Bellevue Councilmembers and Sound Transit Board Members also attended the open house. Comments and input received included:

- General support for cost-savings measures
- Concern for noise and visual impacts
- Opposition to additional property acquisitions
- Concern for increased cut-through traffic in the Surrey Downs neighborhood
- Preference for a grade-separated alignment on 112th Ave SE
- Concern for environmental effects
- Support for easy access to light rail stations
- General support for the downtown station ideas

Community members were asked to sign in upon arrival and received an East Link Project folio and comment form. Staff ambassadors greeted participants and explained the cost savings process and ideas under consideration. Technical staff reviewed the ideas and invited participants to note their comments directly on design plans or comment forms provided. In addition to the ideas with potential changes to the MOU Project Description, ideas for further engineering review and ideas previously reviewed and not selected were also shared. Staff collected approximately 160 comments at the first open house. All comments from the Cost Savings Open House #1, stakeholder briefings, correspondence and Cost Savings Open House #2 (June 5, 2012) will be compiled and shared with the Sound Transit Board and Bellevue City Council and made available to the public on the project website.

Sound Transit and the City collaborated to spread the word about the cost savings process and opportunities for public involvement. The open houses were broadly advertised through the following channels:

- Display advertisements in the Bellevue Reporter, Seattle Transit Blog, La Raza, Seattle Chinese Post, Publicola.net, and BellevuePatch.com;

- Postcards mailed to 31,201 eastside residents and businesses;
- A press release to local papers and blogs;
- Email notification to 5,041 subscribers of the East Link Project listserv, subscribers of the Bellevue Gov Alert, subscribers of the neighborhood newsletter, and other agency or community group;
- Announcements on the City and Sound Transit project web pages;
- Sandwich boards displayed at key locations in Bellevue;
- Posters distributed to community locations; and
- Social media announcements to 4,061 City of Bellevue and Sound Transit Facebook fans and 7,960 Twitter followers.

Sound Transit and the City are working together to attend stakeholder briefings throughout May, June and July; and respond to correspondence. A Cost Savings Open House # 2 will be held on Tuesday, June 5, 2012 from 4-7pm at Bellevue City Hall. The purpose of the second open house is to present the information provided in this report.

6.0 Next Steps

The cost-savings ideas presented at the open house and to the City Council and Sound Transit Board were identified through a process somewhat unique to East Link. In recognition of the commitment to collaborate on ways to deliver the Project within the resources available, the agencies invited outside experts with experience in construction and operation of light rail and major public construction projects to review the Project and generate ideas that could lead to cost savings. This was a more enhanced process than the typical value engineering that happens during final design. Standard value engineering work is ongoing and will continue throughout final design.

Cost savings ideas categorized as ideas that "impact the MOU Project Description," would, if ultimately determined to be ideas that should be incorporated into East Link, require approval by both agencies; by the Sound Transit Board as modifications to the approved Project , and by the City Council as modifications to the Project described in the MOU. Before either agency can take that action, additional engineering work and environmental review is necessary to identify impacts and mitigation consistent with the standards applicable to East Link. This additional engineering and environmental work requires time and resources, and would occur as design of the Project moves forward into 2012 and 2013.

In order to ensure that this dedication of time and resources has the support of both agencies, the Sound Transit Board and Bellevue City Council will be asked in June to endorse moving forward for further feasibility analysis only those Cost Savings Ideas that the agencies believe could be incorporated into East Link and support the agencies' commitment to deliver a high-quality, well-integrated Project which serves the region. This June endorsement 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 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 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.

The entire Cost Savings Report and open house graphics can be found at www.soundtransit.org/eastlink

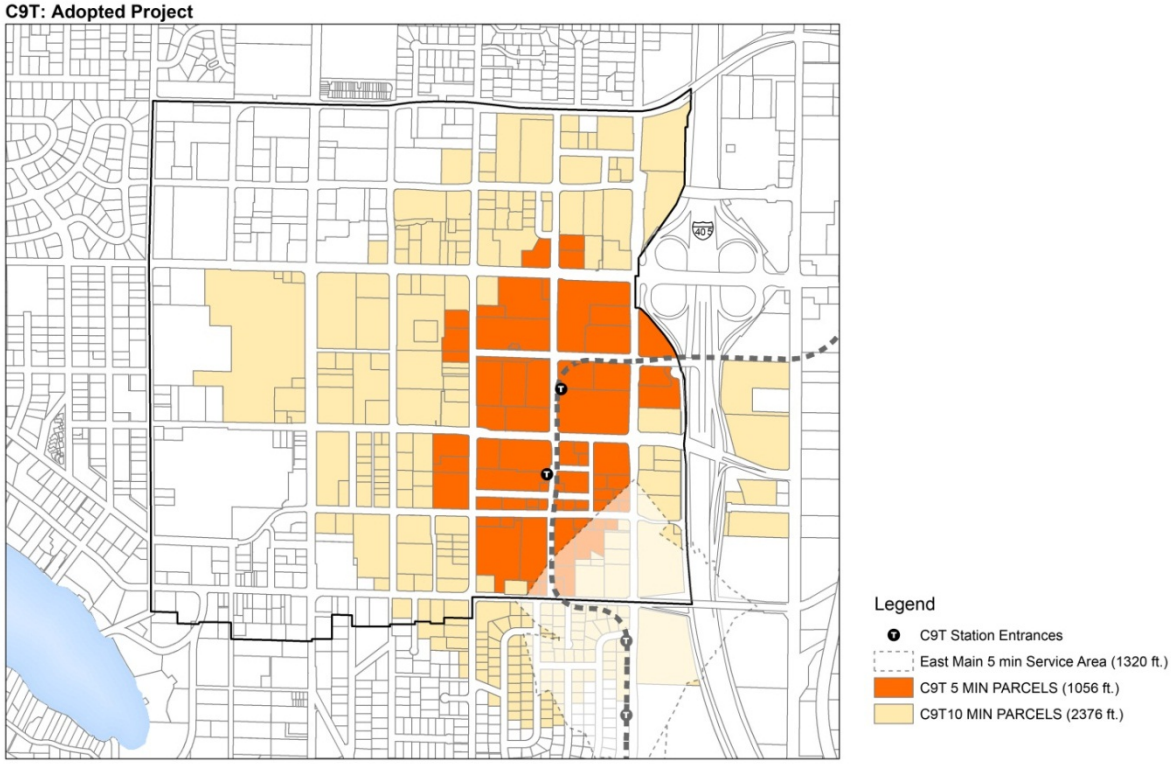
7.0 Appendix A - Downtown Bellevue Walk Analysis

Land Use Accessibility/Walk Distance Analysis

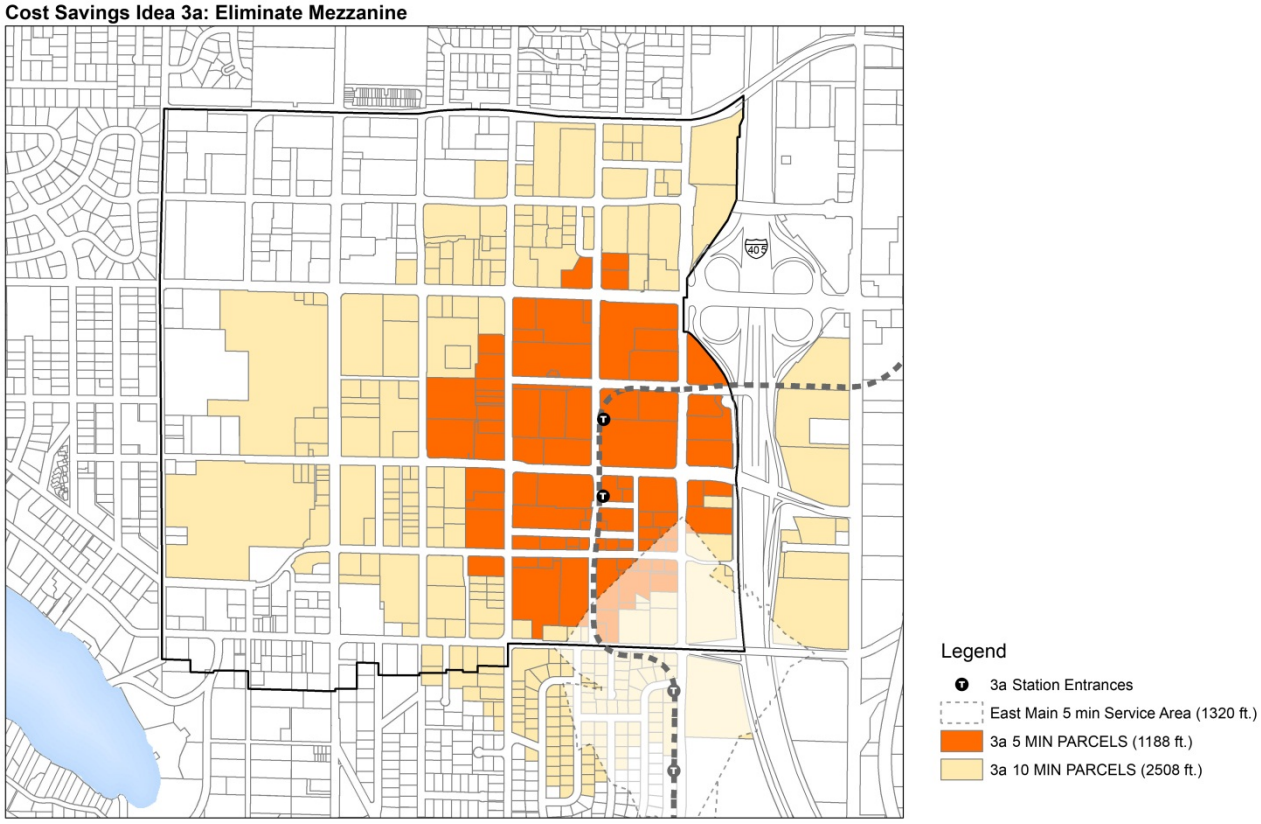
A walk distance analysis has been performed to better understand the differences in pedestrian capture areas associated with the Adopted Project (C9T station) and four cost savings ideas. This analysis conducted by the City of Bellevue assesses the percent of forecast 2030 Downtown jobs and residents that would be within a 5-minute and 10-minute walk distance of the primary Downtown "Bellevue Transit Center" station. Shown on the walk maps are the parcels that would be accessible by 5-minute and 10-minute walk times. The 5-minute walk distance from the East Main station is shown on the maps for reference.

Using an average walk speed of 3.0 miles per hour, the 5-minute walk represents the higher-capture, 1/4-mile distance for transit users. The 10-minute walk represents a 1/2-mile walk distance. The 5-minute and 10-minute walk distances have been adjusted to take into account vertical circulation at the Downtown station. The tunnel station in the Adopted Project (C9T) includes a 60-second delay for a pedestrian to reach the nearest sidewalk/pedestrian route. Cost savings idea 3a (Eliminate Mezzanine) includes a 30-second delay for vertical circulation because of the reduced depth of the station. Cost savings idea 3b (Stacked Tunnel) includes a 60-second delay. And cost savings ideas 3c (Relocate Station to NE 6th St) and 3d (Relocate Station to City Hall/ Metro Site) both include a 30-second delay for vertical circulation. This analysis does not include travel distance reductions for intersection delay. Much of the intersection delay would occur for north/south travel across NE 4th and NE 8th Street, and it is assumed pedestrians would travel across the intersection if their destination was in close proximity across the street.

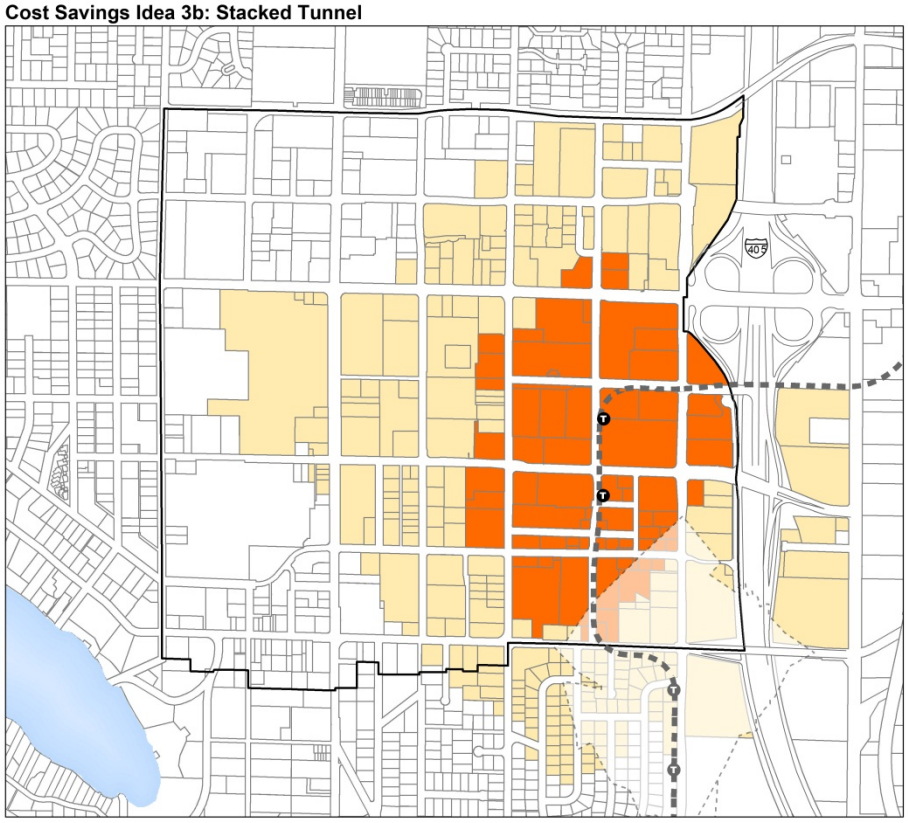
C9T: Adopted Project



Cost Savings Idea 3a: Eliminate Mezzanine



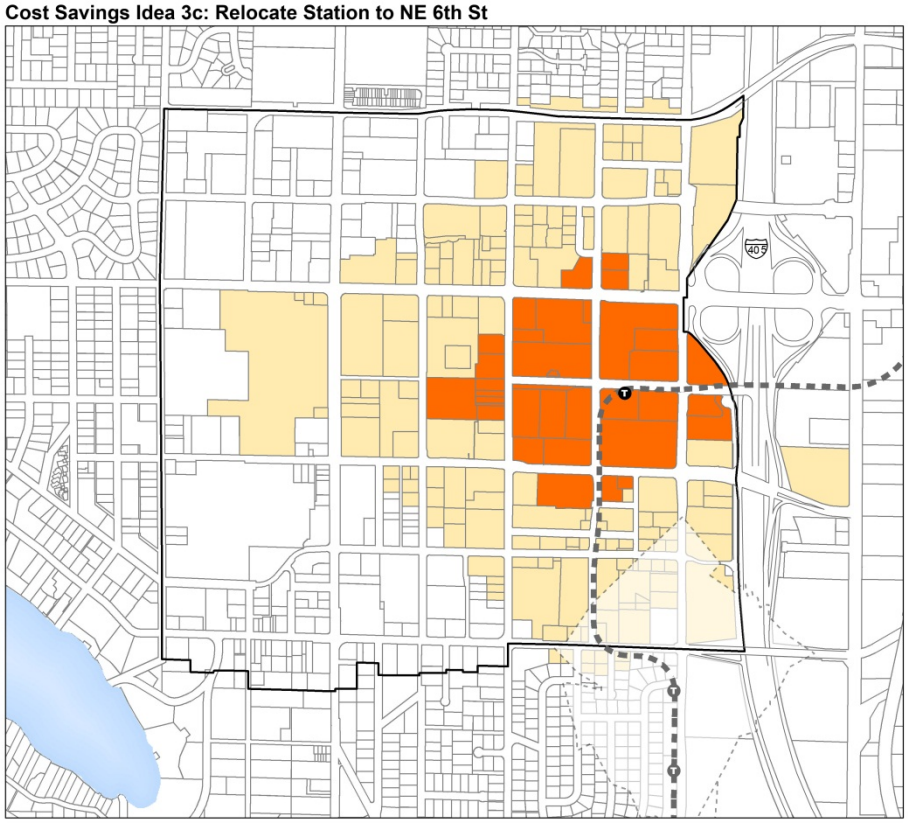
Cost Savings Idea 3b: Stacked Tunnel



Legend

- 3b Station Entrances
- East Main 5 min Service Area (1320 ft.)
- 3b 5 MIN PARCELS (1056 ft.)
- 3b 10 MIN PARCELS (2376 ft.)

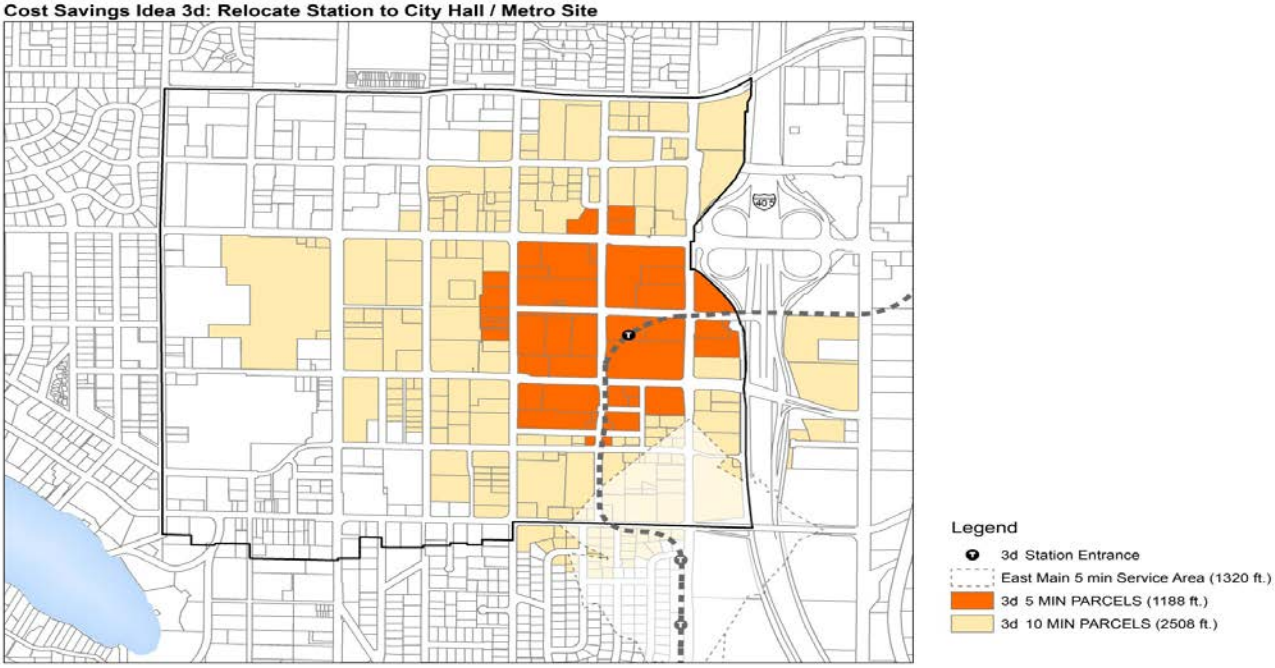
Cost Savings Idea 3c: Relocate Station to NE 6th St



Legend

- 3c Station Entrance
- East Main 5 min Service Area (1320 ft.)
- 3c 5 MIN PARCELS (1188 ft.)
- 3c 10 MIN PARCELS (2508 ft.)

Cost Savings Idea 3d: Relocate Station to City Hall / Metro Site



Land Use Accessibility (Walk Distance Analysis)		**Adopted Project C9T**	Cost Savings Ideas			
			Eliminate Mezzanine 3a	**Stacked Tunnel 3b**	**Relocate Station to NE 6th St 3c**	**Relocate Station to City Hall/ Metro Site 3d**
2030 Downtown jobs within walking distance of "Bellevue Transit Center" station	Percent within 5-minute walk	36%	44%	38%	33%	33%
	Percent within 10-minute walk	89%	89%	89%	88%	88%
2030 Downtown residents within walking distance of "Bellevue Transit Center" station	Percent within 5-minute walk	14%	19%	14%	4%	7%
	Percent within 10-minute walk	60%	63%	60%	49%	56%