Item No.	7a_supp
Date of Meeting	September 25, 2018

Update on ST3 West Seattle and Ballard Link Extensions

Level 2 Screening Results

September 25, 2018

Port of Seattle

Primary Port of Seattle Objectives for ST3 Projects

1. Improve regional transportation for personal mobility, while protecting maritime and industrial land uses and freight mobility;

2. Strengthen access to POS/NWSA facilities, both existing and future developments; and

3. Enhance service to Seattle-Tacoma International Airport for passengers and employees, from a web of cities throughout the region.

System expansion

Sound Transit's system expansion means every few years new light rail, bus rapid transit and commuter rail stations open throughout the region, providing fast, reliable alternatives to congested roads.

soundtransit.org/system

ST3 Representative project

- Identifies mode, corridor, number of stations, general station locations
- Informs cost, schedule, operating needs

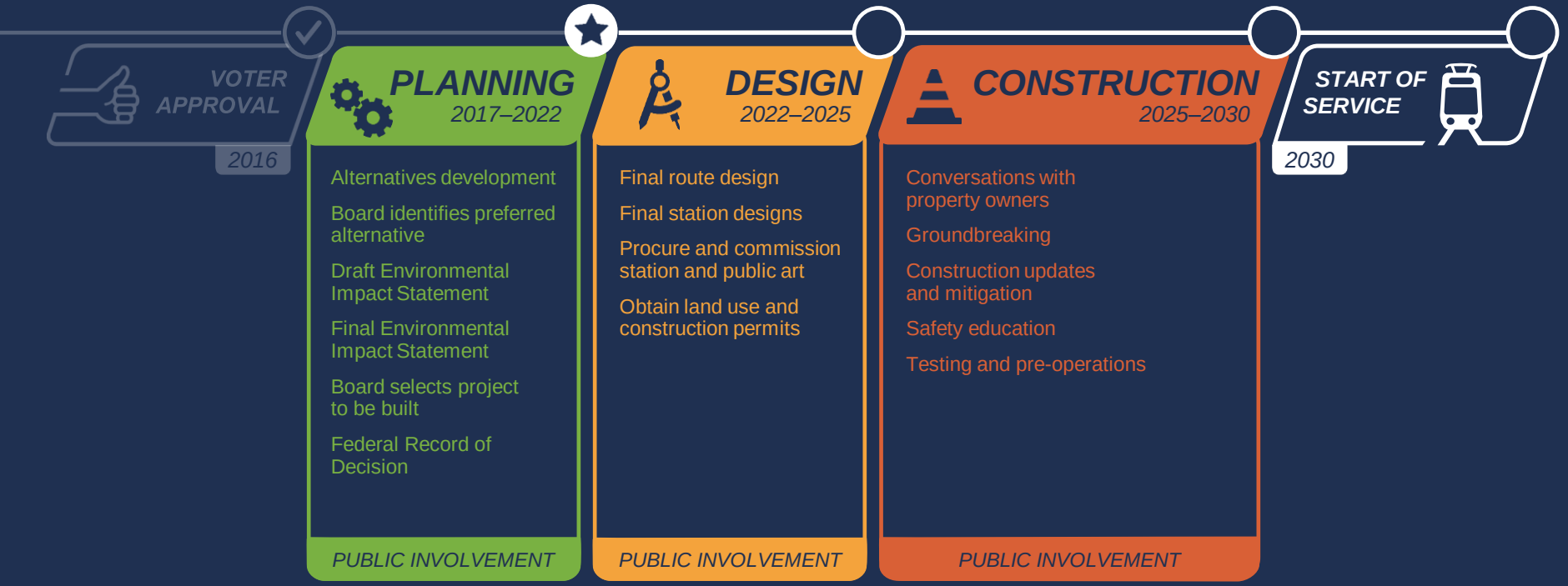
West Seattle Link Extension

- Opening 2030
- Four elevated stations at SODO, Delridge, Avalon and Alaska Junction; one at-grade station at Stadium
- New rail-only fixed span crossing of the Duwamish River
- Length: 4.7 miles

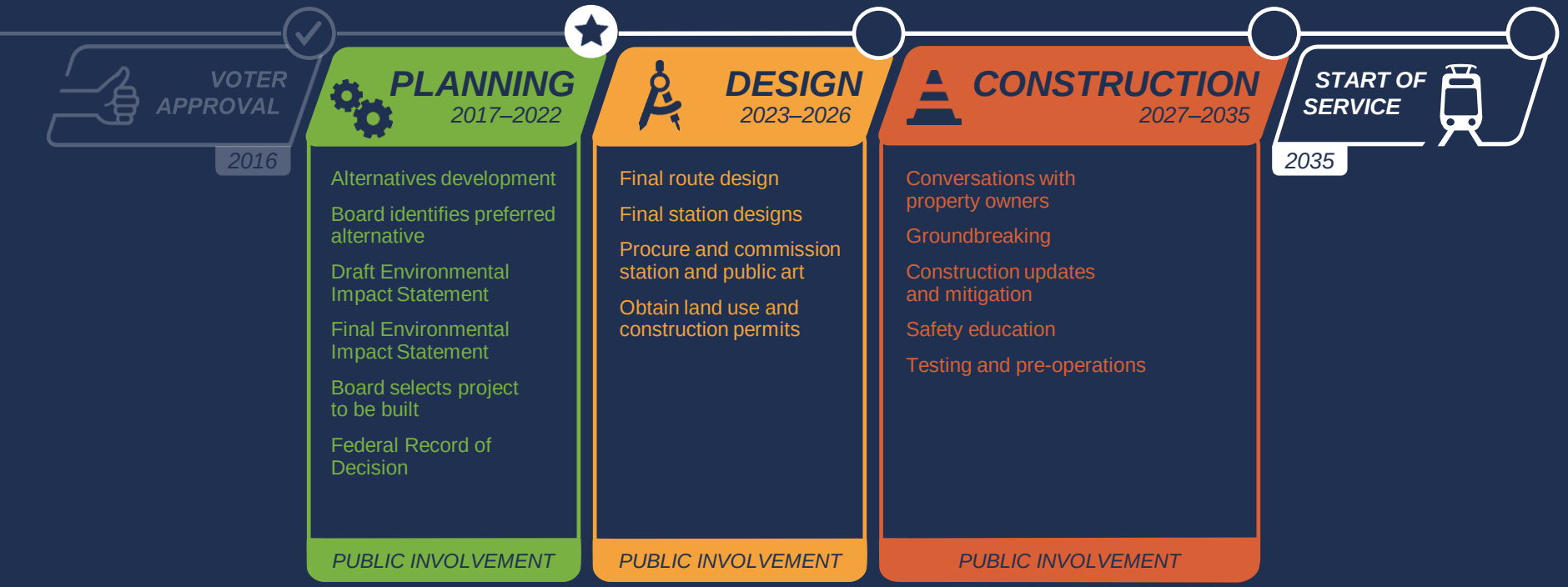
Ballard Link Extension

- Opening 2035
- Three elevated stations: Ballard, Interbay, Smith Cove
- Six tunnel stations: Seattle Center, South Lake Union, Denny, Westlake, Midtown, International District/Chinatown
- New rail-only movable bridge over Salmon Bay
- Length: 7.1 miles

West Seattle project timeline



Ballard project timeline



VOTER APPROVAL

2016

PLANNING

DESIG

2017–2019

Alternatives development

Board identifies preferred alternative

2019–2022

Draft Environmental Impact Statement

Final Environmental Impact Statement

Board selects project to be built

Federal Record of Decision

PUBLIC INVOLVEMENT

Alternatives development process

LEVEL 1
Alternatives development

Early-2018

Conduct early scoping

Study ST3 representative project and alternatives

Screen alternatives

PUBLIC INVOLVEMENT

LEVEL 2
Alternatives development

Mid-2018

Technical analysis

Refine and screen alternatives

PUBLIC INVOLVEMENT

LEVEL 3
Alternatives development

Late-2018 / Early-2019

Refine and screen alternatives

Conduct Environmental Impact Statement (EIS) scoping

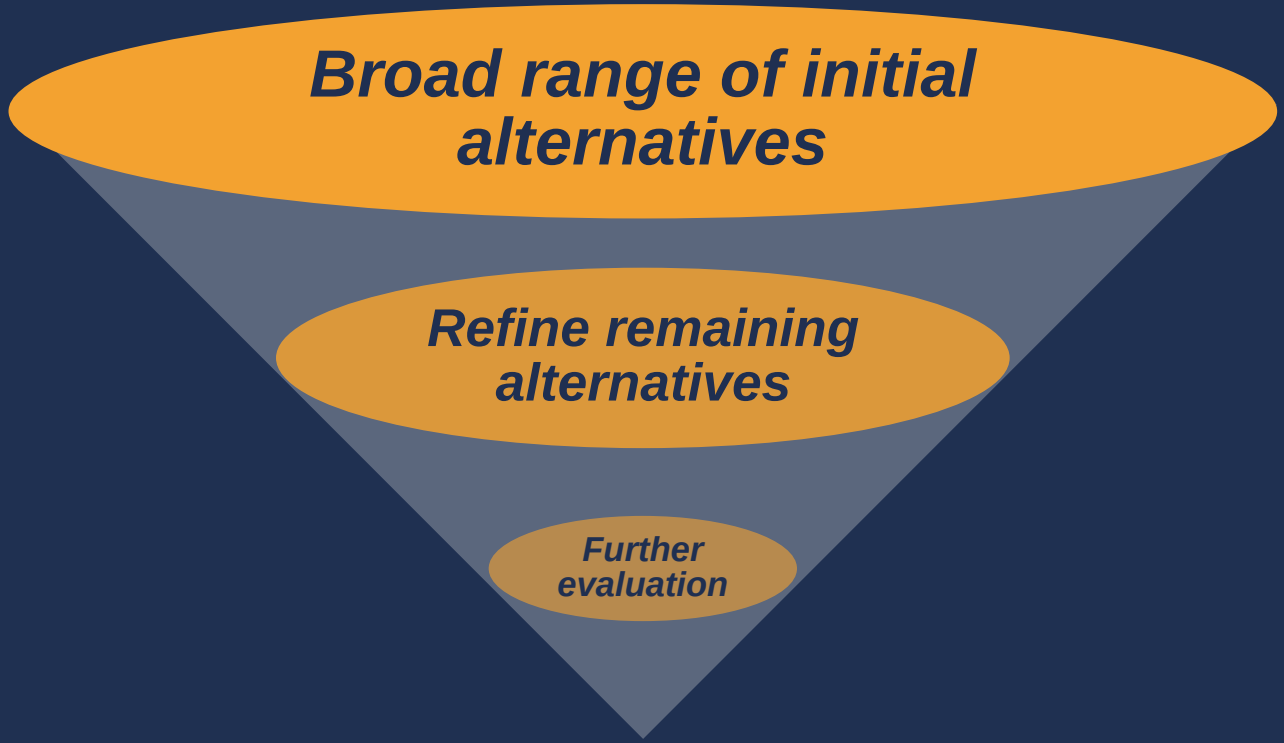
PUBLIC INVOLVEMENT

PREFERRED ALTERNATIVE*

Early-2019

*The Sound Transit Board identifies preferred alternatives and other alternatives to study.

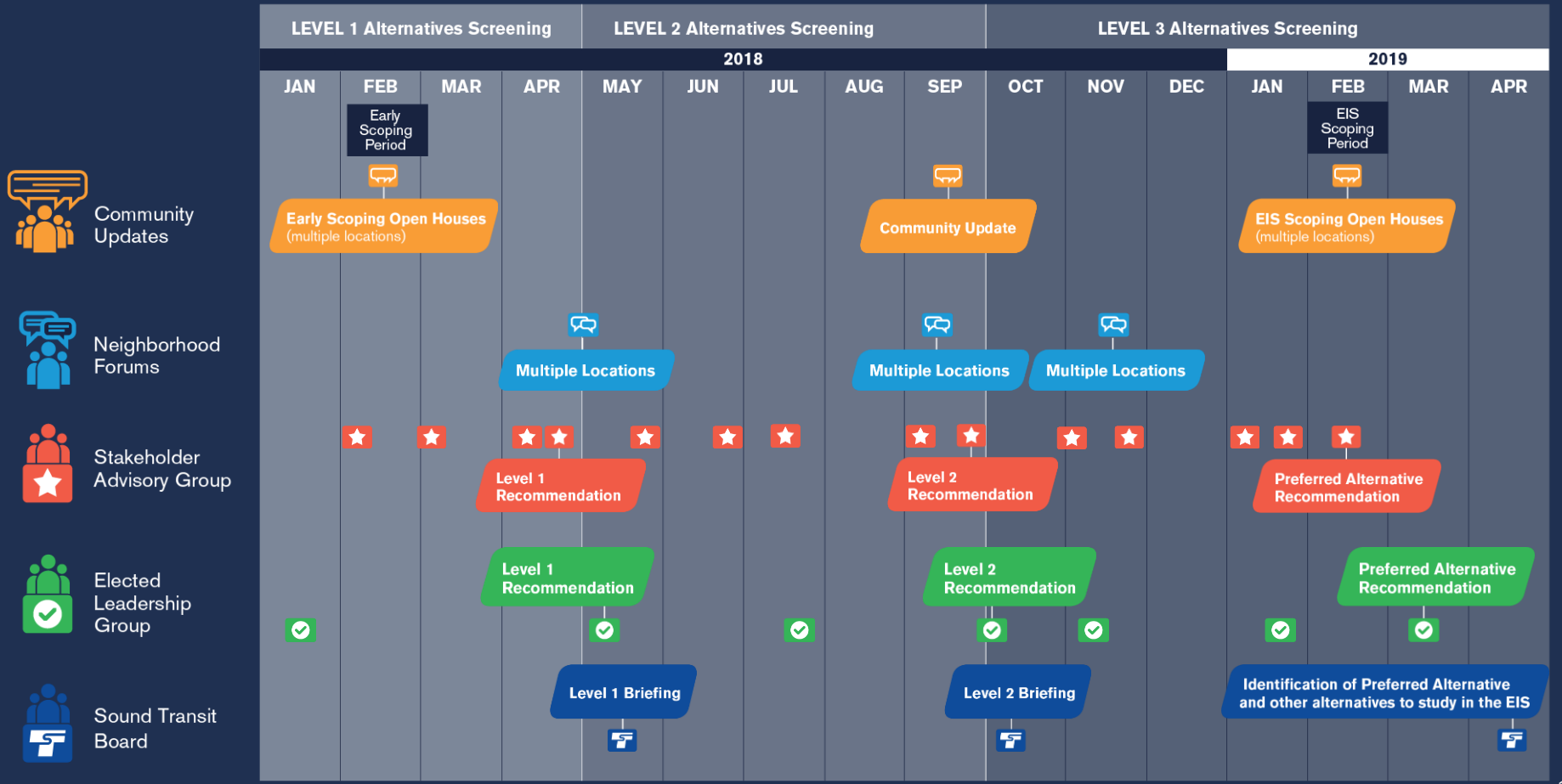
Screening process



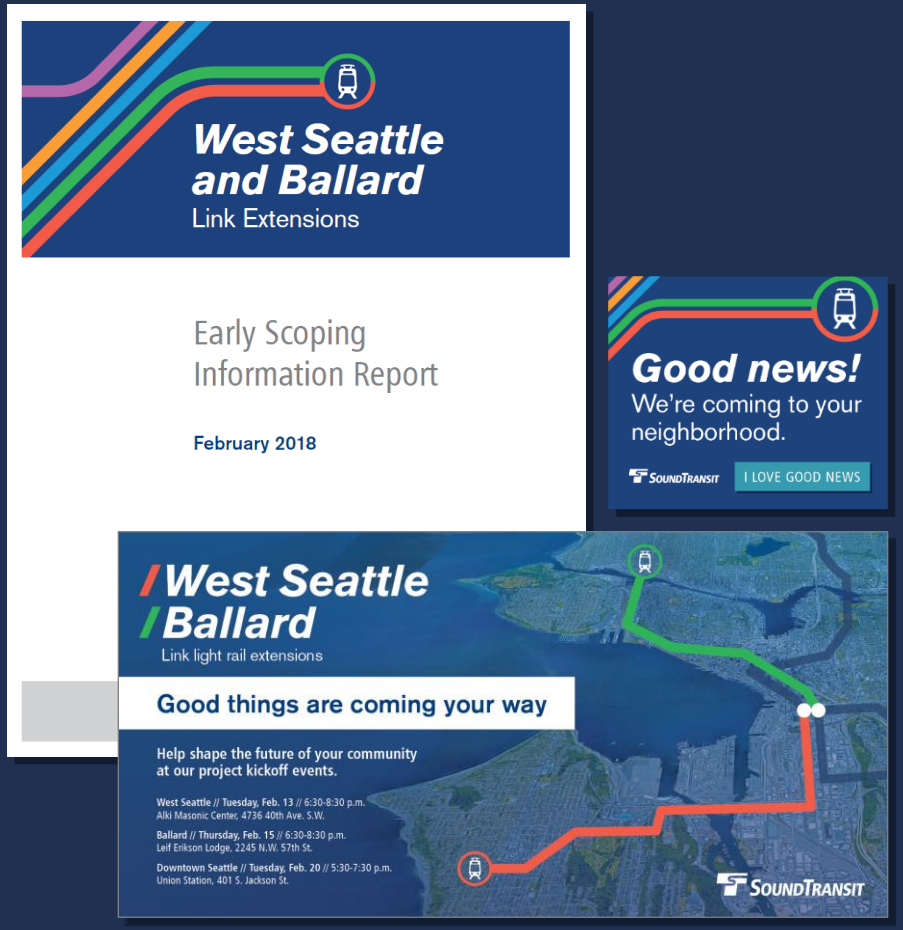
Preferred Alternative and other EIS alternatives

Community Engagement and Collaboration

Community engagement and collaboration



Meeting dates subject to change.



Overview

- Early scoping: Feb. 2 – March 5
- Notification via postcards, advertisements, project website, email updates, press releases, social media, agency invitation letters, etc.
- 3 public meetings in Feb.
- Online open house
- 1 agency meeting
- Other methods to comment

Neighborhood forums

- **4/21:** Chinatown / Int'l District
- **4/23:** Denny / SLU / Seattle Center
- **5/2:** Midtown / Westlake
- **5/5:** Delridge / Avalon / Alaska Junction
- **5/9:** SODO / Stadium
- **5/12:** Ballard / Interbay / Smith Cove

External Engagement Report: Jun-Aug 2018

17 comments and questions

6 email updates engaging more than **4,000** subscribers

4 Tweets engaging more than **82,000** users

5 posts engaging more than **30,000** users

8 festivals engaging more than **3,300** community members

49 community briefings

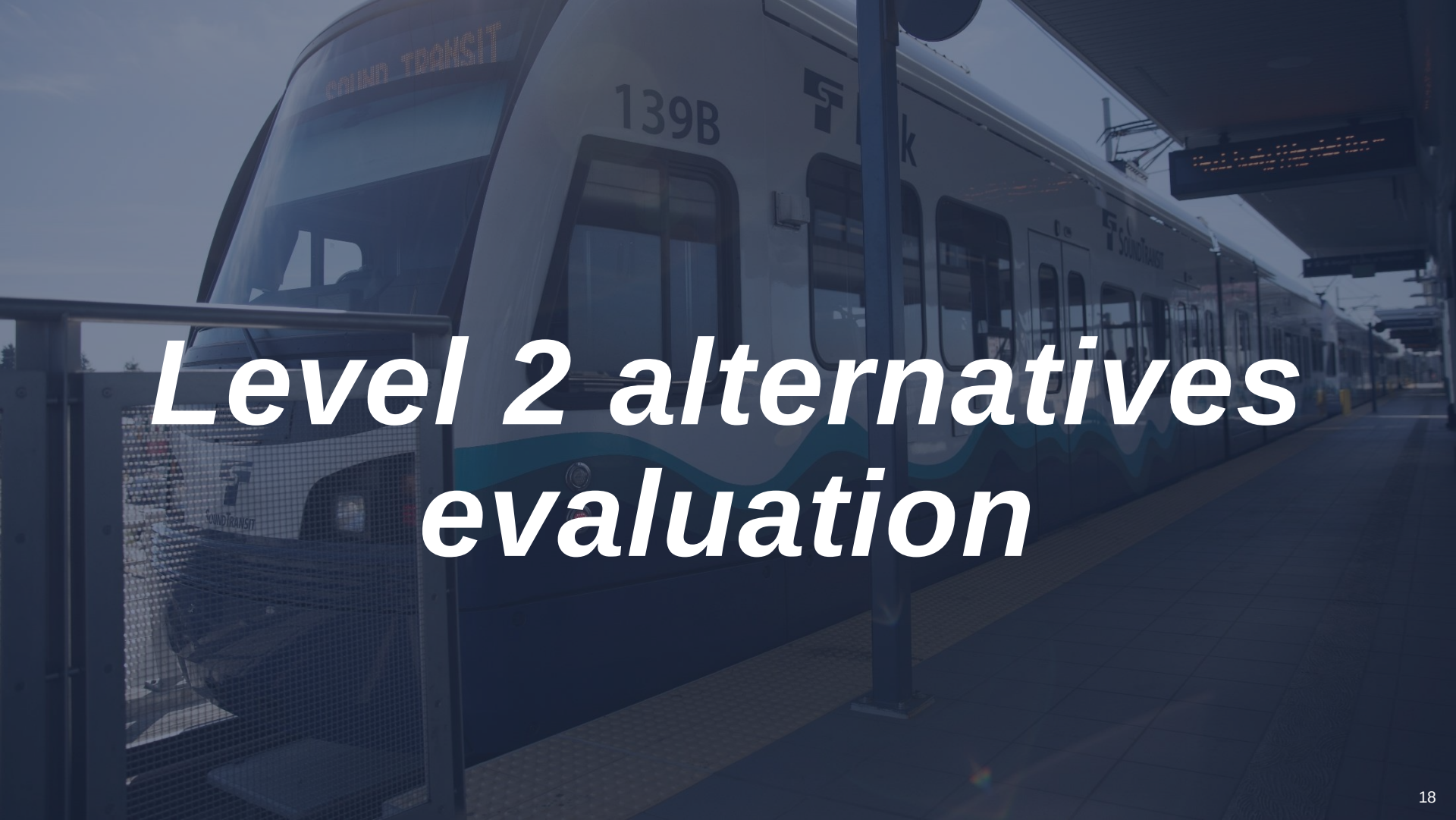
2 Stakeholder Advisory Group meetings

1 Elected Leadership Group meeting

Station Charrettes

Collaborative design sessions with agencies, key community stakeholders

- ✓ 6/28: Ballard / Interbay
- ✓ 7/12: Seattle Center
- ✓ 7/20: Delridge
- ✓ 7/24: Alaska Junction / Avalon
- ✓ 7/30: Chinatown – International District
- ✓ 8/2: Denny / SLU
- ✓ 8/28 SODO/Stadium



Level 2 alternatives evaluation

Purpose and need

Purpose Statement	Symbol
Provide high quality rapid, reliable, and efficient peak and off-peak LRT service to communities in the project corridors as defined in ST3.	
Improve regional mobility by increasing connectivity and capacity through downtown Seattle to meet the projected transit demand.	
Connect regional centers as described in adopted regional and local land use, transportation, and economic development plans and Sound Transit's *Regional Transit Long-Range Plan*.	
Implement a system that is consistent with the *ST3 Plan* that established transit mode, corridor, and station locations and that is technically feasible and financially sustainable to build, operate, and maintain.	
Expand mobility for the corridor and region's residents, which include transit dependent, low income, and minority populations.	
Encourage equitable and sustainable urban growth in station areas through support of transit-oriented development, station access, and modal integration in a manner that is consistent with local land use plans and policies.	
Preserve and promote a healthy environment and economy by minimizing adverse impacts on the natural, built and social environments through sustainable practices.	

Evaluation criteria

- *17 criteria consistent in all levels of evaluation*

- Reliable service
- Travel times
- Regional connectivity
- Transit capacity
- Projected transit demand
- Regional centers served
- ST Long-Range Plan consistency
- ST3 consistency
- Technical feasibility
- Financial sustainability
- Historically underserved populations
- Station area local land use plan consistency
- Modal integration
- Station area development opportunities
- Environmental effects
- Traffic operations
- Economic effects

Measures and methods

- *50+ quantitative and/or qualitative measures*
- *Rating thresholds for High, Medium and Low*
- *Key differentiators and findings*

Lower Performing

Medium Performing

Higher Performing

Cost assessment

- **Purpose:** To ***inform comparison*** of Level 2 alternatives
- **Comparative costs *by segment***
  - Consistent methodology (2017$; construction, real estate, etc.)
  - Based on limited conceptual design (less than 5% design)
  - Final project budget established at 60% design (~ 2024)
- Costs for ***end-to-end alternatives*** in Level 3

Financial constraints

- ST3 Plan budget based on 2014 conceptual cost estimates
- Significant recent escalation in construction and real estate costs
- Level 2 cost assessment provides basis for comparison of alternatives within a segment
- Level 3 end-to-end alternatives will facilitate comparison to ST3 budget
- Be mindful of financial realities when considering Level 2 recommendations

Study segments

1

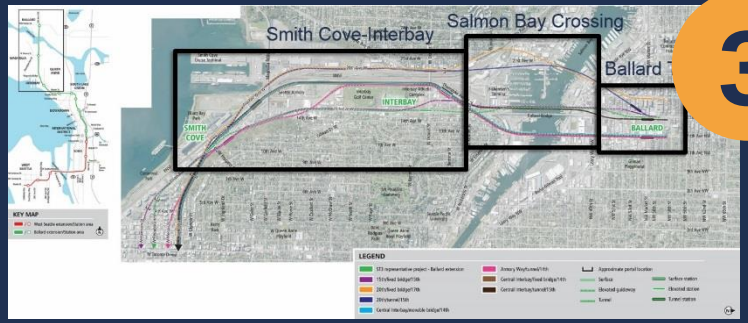
Map of alternatives

2

Evaluation Measures	ST3 Representative Project	15th/Fixed Bridge/15th	20th/Fixed Bridge/15th	20th/Tunnel/15th	Central Interbay/Movable Bridge/14th	Armory Way/Tunnel/14th	Central Interbay/Fixed Bridge/14th	Central Interbay/Tunnel/15th
quality rapid, reliable, and efficient peak and off-peak light rail transit service to communities in the project corridors defined in ST3.								
Service Interruptions	Lower	Higher	Higher	Higher	Lower	Higher	Higher	Higher
Times (minutes)	5 to 6	5 to 6	5 to 6	5 to 6	5 to 6	5 to 6	5 to 6	5 to 6
al mobility by increasing connectivity and capacity through downtown Seattle to meet projected transit demand.								
ork Integration	Medium	Medium	Medium	Medium	Medium	Medium	Medium	Medium
r Carrying Capacity	Medium	Medium	Medium	Medium	Medium	Medium	Medium	Medium
Iversal (2040 pop/emp) [A]	17,200	16,700	16,000	17,000	15,400	16,400	15,400	16,500
gional centers as described in adopted regional and local land use, transportation, and economic development plans and Sound Transit's Long-Range Plan.								
nal Growth Centers Served	N/A [B]	N/A	N/A	N/A	N/A	N/A	N/A	N/A
cturing/Industrial Centers Served	1	1	1	1	1	1	1	1
Accommodates Future LRT Extension	Medium	Medium	Lower	Higher	Medium	Higher	Medium	Higher
Implement a system that is consistent with the ST3 Plan that established transit mode, corridor, and station locations and that is technically feasible and financially sustainable to build, operate, and maintain.								
Mode, Route and Stations per ST3	Higher	Higher	Higher	Higher	Higher	Higher	Higher	Higher
Potential ST3 Schedule Effects	Higher	Higher	Higher	Higher	Higher	Higher	Higher	Higher
Potential ST3 Operating Plan Effects	Lower	Higher	Higher	Higher	Lower	Higher	Higher	Higher
Engineering Constraints	Medium	Medium	Medium	Lower	Higher	Lower	Higher	Lower
Constructability Issues	Medium	Medium	Medium	Lower	Higher	Lower	Higher	Lower
Operational Constraints	Lower	Higher	Higher	Higher	Lower	Higher	Higher	Higher
Conceptual Capital Cost Comparison		$200M increase	$500M increase	$700M increase	$200M increase	$300M increase	$100M increase	$500M increase
Operating Cost Impacts	Medium	Medium	Medium	Medium	Medium	Medium	Medium	Medium
Expand mobility for the corridor and region's residents, which include transit dependent, low income, and minority populations.								
Opportunities for Low-income/Minority activity nodes/subsidized rental units) [C]	Medium	Medium	Medium	Medium	Medium	Medium	Medium	Medium
	6%	6%	6%	6%	6%	6%	6%	6%
Low-Income Population [D2]	19% / 18%	20% / 18%	20% / 18%	20% / 18%	19% / 18%	19% / 18%	19% / 18%	19% / 18%
Minority Population [D2]	21% / 20%	21% / 20%	21% / 20%	21% / 20%	21% / 20%	21% / 20%	21% / 20%	21% / 20%
Youth Population [D2]	5% / 12%	11% / 12%	11% / 12%	11% / 12%	12% / 12%	11% / 12%	12% / 12%	10% / 12%
Elderly Population [D2]	10% / 10%	10% / 10%	10% / 10%	10% / 10%	9% / 10%	9% / 10%	9% / 10%	10% / 10%
Limited English Proficiency Population [D2]	4% / 3%	4% / 3%	4% / 3%	4% / 3%	3% / 3%	3% / 3%	3% / 3%	3% / 3%
Disabled Population [D2]	9% / 8%	9% / 8%	9% / 8%	9% / 8%	8% / 8%	8% / 8%	8% / 8%	9% / 8%

Evaluation measures

3



Key differentiators

4

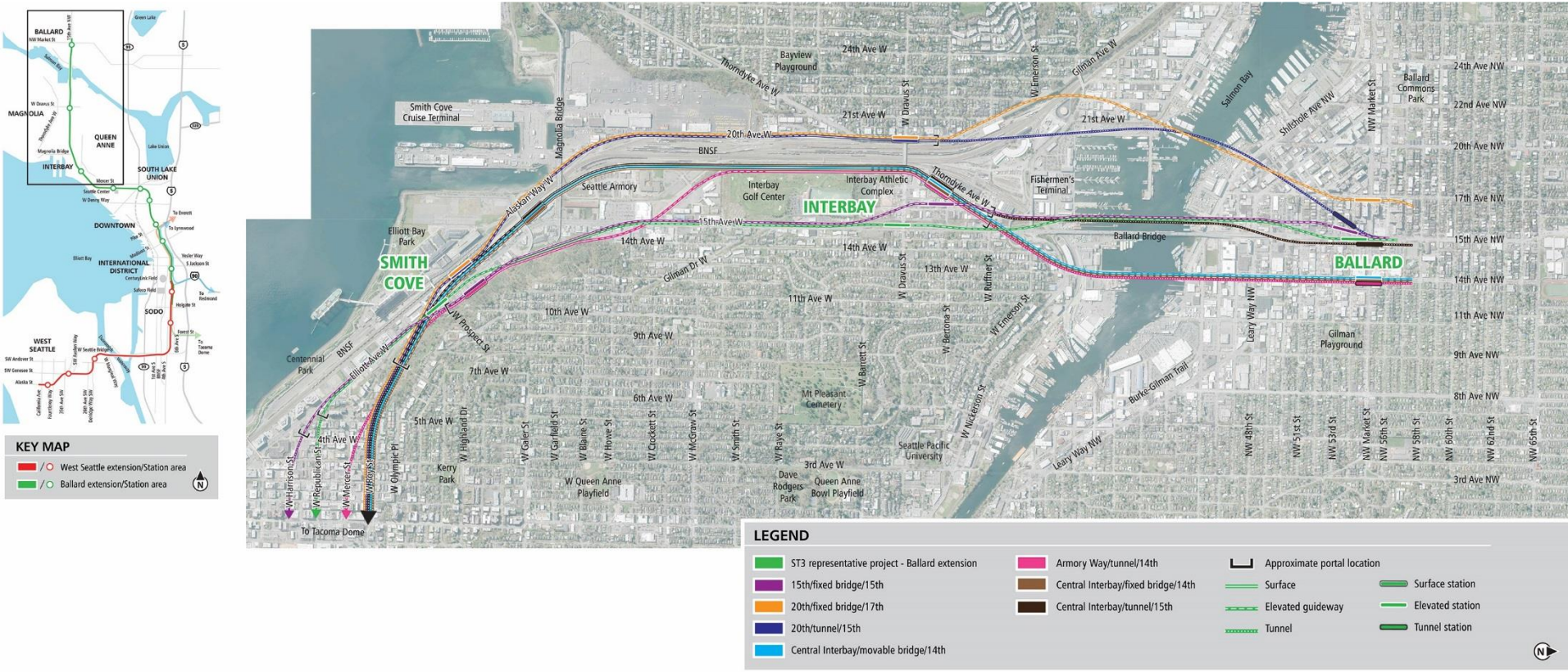
	Key findings	Cost comparison*	Schedule comparison*
Representative Project			
Alternative 1	• Key finding • Key finding • Key finding	-$XXXM	Medium Performing
Alternative 2	• Key finding • Key finding • Key finding	+$XXXM	Lower Performing

Summary

Level 2 alternatives

Interbay/Ballard

- ST3 Representative Project
- 15th/Fixed Bridge/15th
- 20th/Fixed Bridge/17th
- 20th/Tunnel/15th
- Armory Way/Tunnel/14th
- Central Interbay/Movable Bridge/14th
- Central Interbay/Fixed Bridge/14th
- Central Interbay/Tunnel/15th



Interbay/Ballard

Level 2 alternatives

Evaluation Measures	ST3 Representative Project	15th/Fixed Bridge/ 15th	20th/Fixed Bridge/ 17th	20th/Tunnel/ 15th	Central Interbay/ Movable Bridge/ 14th	Armory Way/ Tunnel/14th	Central Interbay/ Fixed Bridge/14th	Central Interbay/ Tunnel/15th
Provide high quality rapid, reliable, and efficient peak and off-peak light rail transit service to communities in the project corridors defined in ST3.								
Potential Service Interruptions	Lower	Higher	Higher	Higher	Lower	Higher	Higher	Higher
Travel Times (minutes)	5 to 6	5 to 6	5 to 6	5 to 6	5 to 6	5 to 6	5 to 6	5 to 6
Improve regional mobility by increasing connectivity and capacity through downtown Seattle to meet projected transit demand.								
Network Integration	Medium	Medium	Medium	Medium	Medium	Medium	Medium	Medium
Passenger Carrying Capacity	Medium	Medium	Medium	Medium	Medium	Medium	Medium	Medium
Ridership Potential (2040 pop/emp) (1)	17,200	16,700	19,000	17,800	15,400	16,400	15,400	16,500
Connect regional centers as described in adopted regional and local land use, transportation, and economic development plans and Sound Transit's Long-Range Plan.								
Regional Growth Centers Served	N/A (3)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Manufacturing/Industrial Centers Served	1	1	1	1	1	1	1	1
Accommodates Future LRT Extension	Medium	Medium	Lower	Higher	Medium	Higher	Medium	Higher
Implement a system that is consistent with the ST3 Plan that established transit mode, corridor, and station locations and that is technically feasible and financially sustainable to build, operate, and maintain.								
Mode, Route and Stations per ST3	Higher	Higher	Higher	Higher	Higher	Higher	Higher	Higher
Potential ST3 Schedule Effects	Higher	Higher	Higher	Higher	Higher	Higher	Higher	Higher
Potential ST3 Operating Plan Effects	Lower	Higher	Higher	Higher	Lower	Higher	Higher	Higher
Engineering Constraints	Medium	Medium	Medium	Lower	Higher	Lower	Higher	Lower
Constructability Issues	Medium	Medium	Medium	Lower	Higher	Lower	Higher	Lower
Operational Constraints	Lower	Higher	Higher	Higher	Lower	Higher	Higher	Higher
Conceptual Capital Cost Comparison	-	$200M increase	$500M increase	$700M increase	$200M increase	$300M increase	$100M increase	$500M increase
Operating Cost Impacts	Medium	Medium	Medium	Medium	Medium	Medium	Medium	Medium
Expand mobility for the corridor and region's residents, which include transit dependent, low income, and minority populations.								
Opportunities for Low-Income/Minority (activity nodes/subsidized rental units) (1)	Medium 8%	Medium 9%	Medium 8%	Medium 8%	Medium 8%	Medium 8%	Medium 8%	Medium 9%
Low-Income Population (1/2)	19% / 18%	20% / 18%	20% / 18%	20% / 18%	19% / 18%	19% / 18%	19% / 18%	19% / 18%
Minority Population (1/2)	21% / 20%	21% / 20%	21% / 20%	21% / 20%	21% / 20%	21% / 20%	21% / 20%	21% / 20%
Youth Population (1/2)	9% / 12%	11% / 12%	11% / 12%	11% / 12%	12% / 12%	11% / 12%	12% / 12%	10% / 12%
Elderly Population (1/2)	10% / 10%	10% / 10%	10% / 10%	10% / 10%	9% / 10%	9% / 10%	9% / 10%	10% / 10%
Limited English Proficiency Population (1/2)	4% / 3%	4% / 3%	4% / 3%	4% / 3%	3% / 3%	3% / 3%	3% / 3%	3% / 3%
Disabled Population (1/2)	9% / 8%	9% / 8%	9% / 8%	9% / 8%	8% / 8%	8% / 8%	8% / 8%	9% / 8%

(1) Within station walksheds
(2) Within 15 minute ride on connecting high frequency transit
(3) NA = Measure not applicable to this segment

Lower Performing | Medium Performing | Higher Performing

Interbay/Ballard

Level 2 alternatives evaluation – *Part 1 of 2*

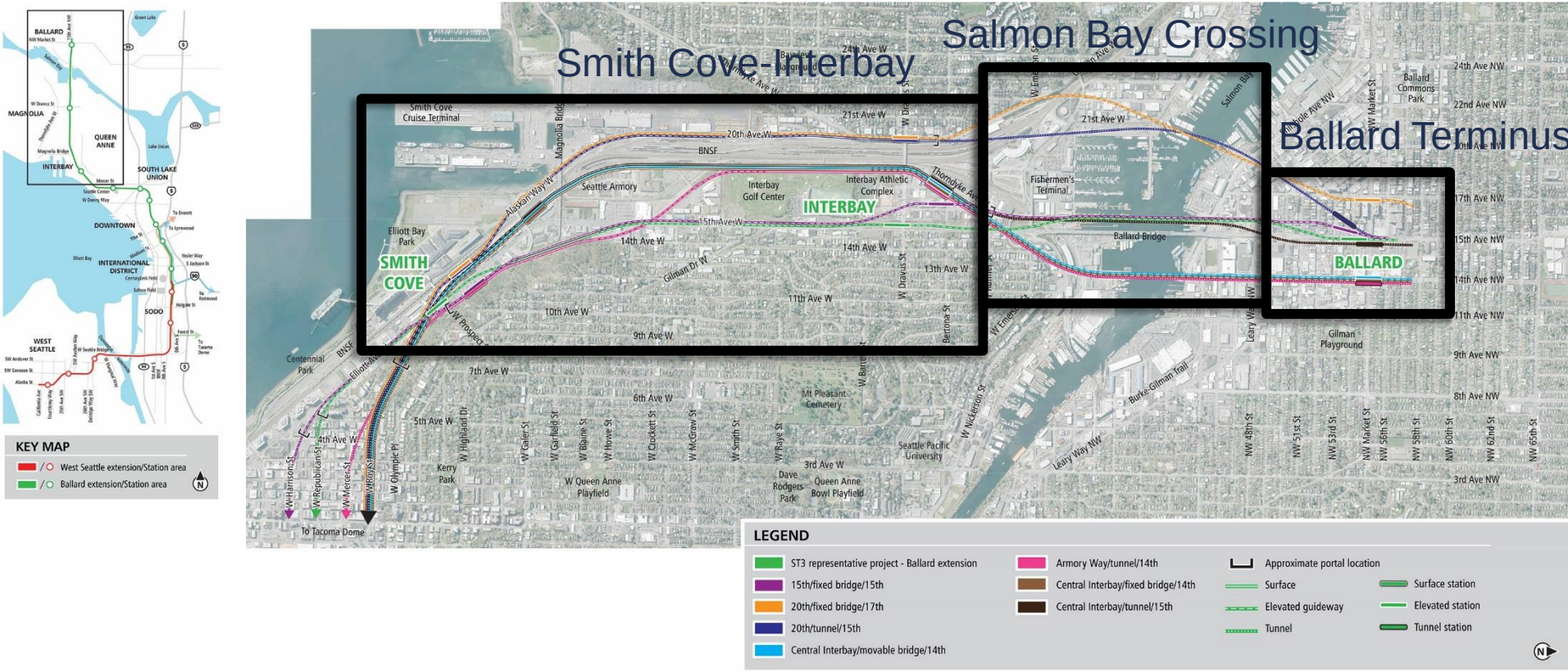
Evaluation Measures	ST3 Representative Project	15th/Fixed Bridge/ 15th	20th/Fixed Bridge/ 17th	20th/Tunnel/ 15th	Central Interbay/ Movable Bridge/ 14th	Armory Way/ Tunnel/14th	Central Interbay/ Fixed Bridge/14th	Central Interbay/ Tunnel/15th
Encourage equitable and sustainable urban growth in station areas through support of transit-oriented development, station access, and modal integration in a manner that is consistent with local land use plans and policies.								
Compatibility with Urban Centers/Villages (1)	Medium	Medium	Medium	Medium	Lower	Lower	Lower	Medium
Station Land Use Plan Consistency	Medium	Medium	Medium	Medium	Medium	Medium	Medium	Medium
Activity Nodes Served (1)	26	32	36	33	24	23	24	35
Passenger Transfers	Medium	Medium	Medium	Medium	Medium	Medium	Medium	Medium
Bus/Rail and Rail/Rail Integration (1)	Higher	Medium	Medium	Higher	Higher	Higher	Higher	Higher
Bicycle Accessibility (1)	Higher	Higher	Higher	Higher	Medium	Higher	Medium	Higher
Pedestrian/Limited Mobility Accessibility (1)	Lower	Medium	Higher	Higher	Lower	Medium	Lower	Medium
Development Potential (1)	Medium	Medium	Higher	Medium	Medium	Medium	Medium	Medium
Equitable Development Opportunities	Lower	Higher	Lower	Lower	Medium	Medium	Medium	Higher
Preserve and promote a healthy environment and economy by minimizing adverse impacts on the natural, built and social environments through sustainable practices.								
Historic Properties/Landmarks (2)	5	7	3	3	3	2	3	3
Potential for Effects to Archaeological Resources (1)	Lower	Lower	Lower	Lower	Lower	Lower	Lower	Lower
Parks and Recreational Resources Effects (acres)	0.2	1	0.9	0.9	4.2	3.9	4.2	3.9
Water Resource Effects (acres)	0.7	0.6	0	0	0.7	0	0.4	0
Fish and Wildlife Habitat Effects (acres)	11	11	0.5	0.5	1	11.4	1	0.5
Hazardous Material Sites (2)	11	15	11	11	16	12	16	12
Visual Effects	Medium	Medium	Medium	Higher	Medium	Medium	Medium	Medium
Noise and Vibration Sensitive Receivers (1)	Higher	Higher	Lower	Medium	Higher	Higher	Higher	Higher
Potentially Affected Properties	Medium	Lower	Lower	Higher	Higher	Higher	Higher	Higher
Residential Unit Displacements	Higher	Lower	Lower	Medium	Medium	Higher	Medium	Higher
Square Feet of Business Displacements	Medium	Medium	Medium	Higher	Medium	Higher	Medium	Lower
Construction Impacts	Lower	Medium	Lower	Medium	Higher	Higher	Higher	Medium
Burden on Low-Income/Minority	Higher	Higher	Higher	Higher	Higher	Higher	Higher	Higher
Traffic Circulation and Access Effects	Lower	Medium	Medium	Higher	Medium	Higher	Medium	Higher
Effects on Existing Transportation Facilities	Medium	Higher	Lower	Medium	Medium	Higher	Medium	Medium
Effects on Freight Movement	Lower	Medium	Medium	Medium	Medium	Higher	Medium	Higher
Business and Commerce Effects	Lower	Lower	Medium	Higher	Medium	Higher	Medium	Medium

(1) Within station walksheds and/or defined buffer of alignment
(2) On properties that overlap with the project footprint

Lower Performing | Medium Performing | Higher Performing

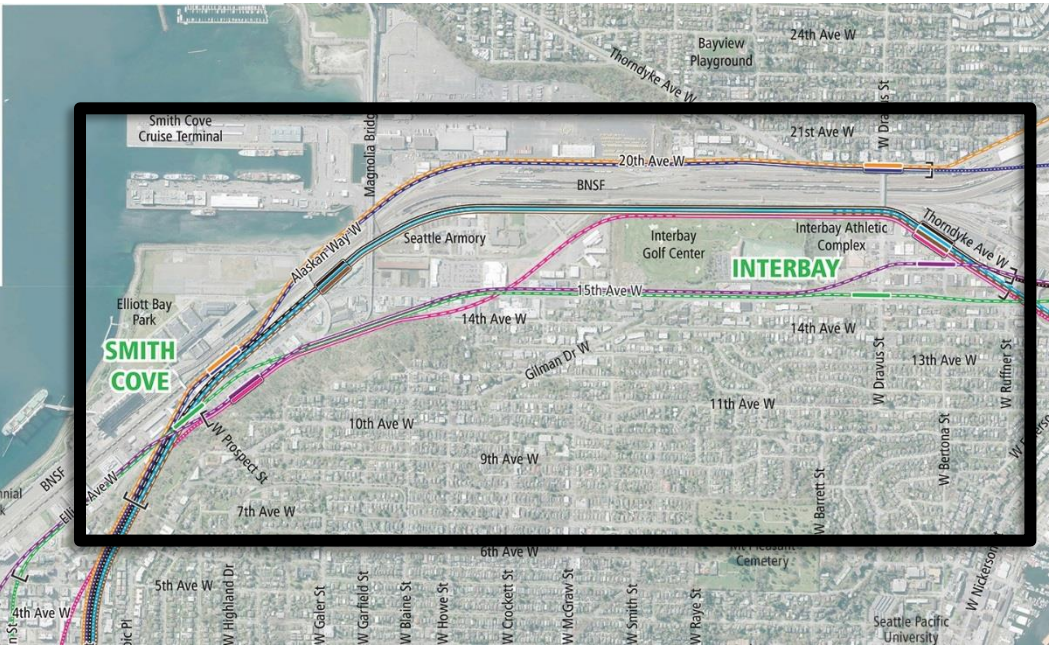
Interbay/Ballard

Level 2 alternatives evaluation – *Part 2 of 2*



Interbay/Ballard

Key differentiators – *By sub-segment*



Smith Cove-Interbay:

Key differentiators

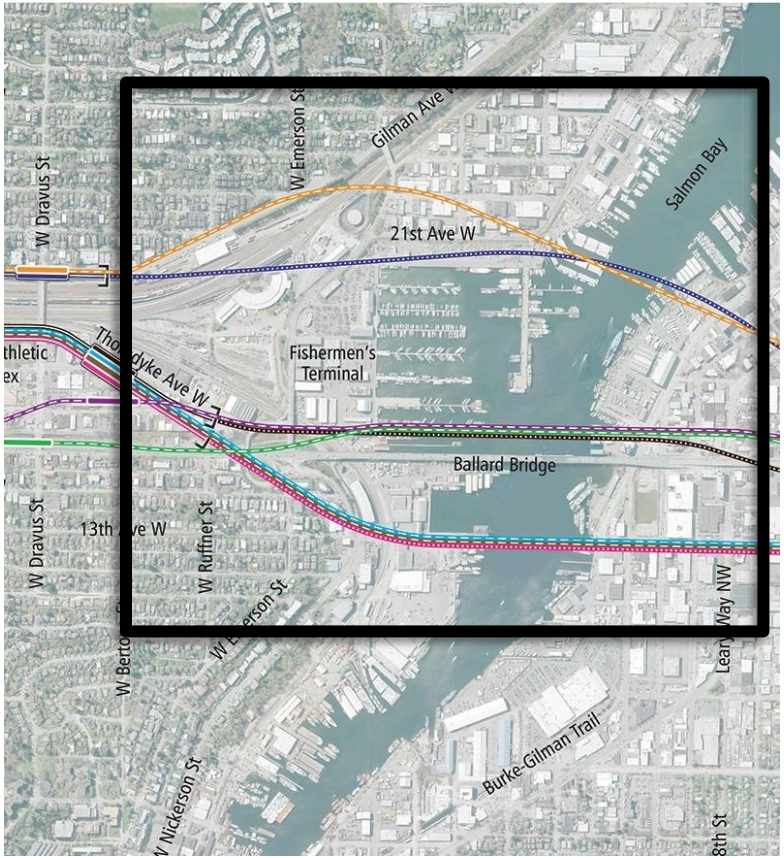
- Station location
- Traffic
- Engineering constraints

Interbay/Ballard

Key differentiators – *Smith Cove-Interbay*

Key differentiators Smith Cove-Interbay

Alternative	Key differentiators
ST3 Representative Project	
15th/Fixed Bridge/15th	Lessens traffic/freight effects (avoids 15th Ave median)
20th/Fixed Bridge/17th	Lessens traffic/freight effects (avoids 15th Ave) Long span bridge (over BNSF tracks) adds complexity
20th/Tunnel/15th	
Central Interbay/ Movable Bridge/14th	Lessens traffic/freight effects (avoids 15th Ave) At-grade sections (along BNSF tracks) lessen complexity
Armory Way/ Tunnel/14th	
Central Interbay/ Fixed Bridge/14th	
Central Interbay/ Tunnel/15th	



Salmon Bay Crossing:

Key differentiators

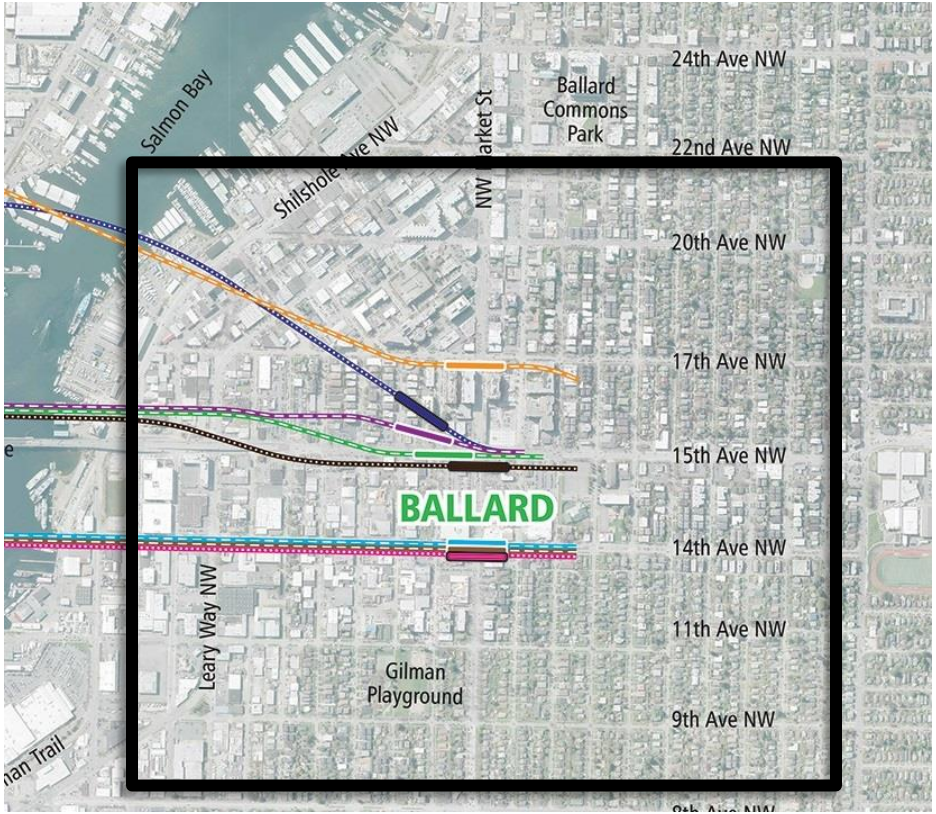
- Crossing location
- Crossing type
  - Bridge (fixed or movable)
  - Tunnel
- Freight movement
- Business/commerce effects

Interbay/Ballard

Key differentiators – *Salmon Bay Crossing*

Key differentiators Salmon Bay Crossing

Alternative	Key differentiators
ST3 Representative Project	
15th/Fixed Bridge/15th	Fewer columns in water than movable bridge Maritime business effects (Fishermen's Terminal)
20th/Fixed Bridge/17th	Long-span fixed bridge avoids columns in water
20th/Tunnel/15th	Longer tunnel, more constrained portal Includes tunnel; requires 3rd Party funding
Central Interbay/ Movable Bridge/14th	Potential service interruptions Maritime business and potential vessel navigation effects
Armory Way/ Tunnel/14th	Shorter tunnel, less constrained portal Includes tunnel; requires 3rd Party funding
Central Interbay/ Fixed Bridge/14th	Fewer columns in water than movable bridge Maritime business effects
Central Interbay/ Tunnel/15th	Shorter tunnel, less constrained portal Includes tunnel; requires 3rd Party funding



Ballard Terminus:

Key differentiators

- Ballard Station location
- Elevated or tunnel

Interbay/Ballard

Key differentiators – *Ballard Terminus*

Key differentiators Ballard Terminus

Alternative	Key differentiators
ST3 Representative Project	
15th/Fixed Bridge/15th	Elevated guideway (west side 15th Ave NW) affects more parcels More residential displacements
20th/Fixed Bridge/17th	Ballard terminus/crossing location affects more residences Closer to center of Urban Village
20th/Tunnel/15th	Tunnel station (west side 15th Ave NW) affects residences Deeper tunnel station (~120'); adds complexity
Central Interbay/ Movable Bridge/14th	Affects fewer parcels (along 14th Ave NW) Farther from center of Urban Village Shallower tunnel station (~70')
Armory Way/ Tunnel/14th	
Central Interbay/ Fixed Bridge/14th	
Central Interbay/ Tunnel/15th	Tunnel station (east side 15th Ave NW) affects businesses Shallower tunnel station (~80')

Summary Interbay/Ballard

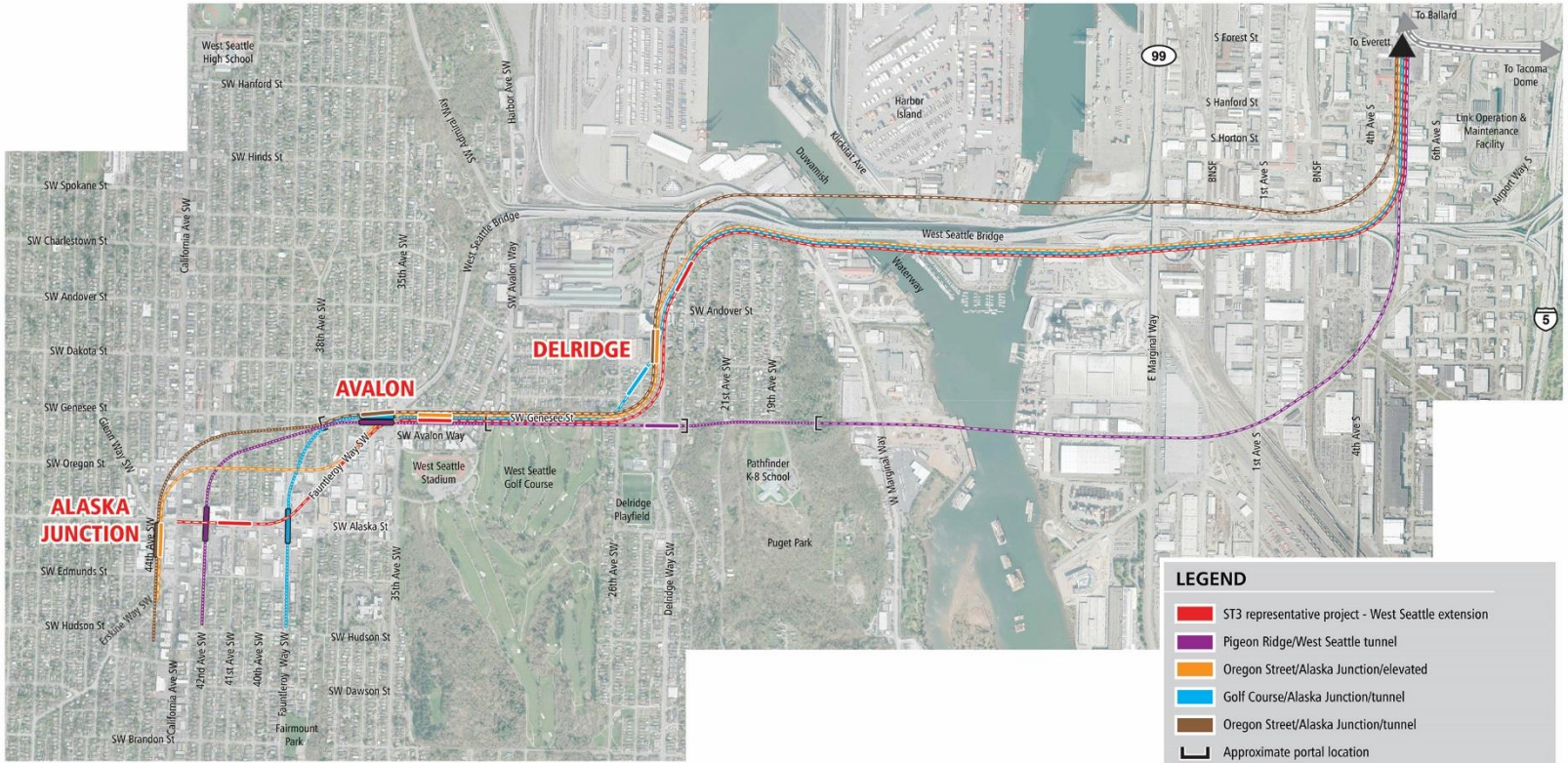
Alternative	Key findings	Cost comparison*	Schedule Comparison**
ST3 Representative Project			
Central Interbay/ Fixed Bridge/14th	• Maritime business effects (but less than movable bridge) • Affects fewer parcels in Ballard (along 14th Ave NW)	+ $100M	Higher Performing
Central Interbay/ Movable Bridge/14th	• Potential service interruptions • Maritime business and potential vessel navigation effects • Affects fewer parcels in Ballard (along 14th Ave NW)	+ $200M	Higher Performing
15th/Fixed Bridge/15th	• Maritime business effects (Fishermen's Terminal) • Elevated guideway (west side 15th Ave NW) affects more residences	+ $200M	Higher Performing
Armory Way/ Tunnel/14th	• Less environmental, maritime business/navigation effects • Affects fewer parcels in Ballard (along 14th Ave NW) • Includes tunnel; requires 3rd Party funding	+ $300M	Higher Performing
Central Interbay/ Tunnel/15th	• Less environmental, maritime business/navigation effects • Tunnel station (east side 15th Ave NW) affects businesses • Includes tunnel; requires 3rd Party funding	+ $500M	Higher Performing
20th/Fixed Bridge/17th	• Long span bridge (over BNSF tracks) adds complexity • Ballard terminus/crossing location affects more residences	+ $500M	Higher Performing
20th/Tunnel/15th	• Long span bridge (over BNSF tracks), constrained tunnel portal location, deeper tunnel station add complexity • Tunnel station (west side 15th Ave NW) affects residences • Includes tunnel; requires 3rd Party funding	+ $700M	Higher Performing

*Cost compared to cost of ST3 Representative Project for this segment. Schedule compared to overall ST3 schedule for this extension.

Level 2 alternatives

West Seattle/Duwamish

- ST3 Representative Project
- Pigeon Ridge/West Seattle Tunnel
- Oregon Street/Alaska Junction/Elevated
- Oregon Street/Alaska Junction/Tunnel (new)
- Golf Course/Alaska Junction/Tunnel (modified)



West Seattle/Duwamish

Level 2 alternatives

Evaluation Measures	ST3 Representative Project	Pigeon Ridge/West Seattle Tunnel	Oregon Street/Alaska Junction/ Elevated	Golf Course/Alaska Junction/ Tunnel	Oregon Street/Alaska Junction/ Tunnel
Provide high quality rapid, reliable, and efficient peak and off-peak light rail transit service to communities in the project corridors defined in ST3.					
Potential Service Interruptions	Higher	Higher	Higher	Higher	Higher
Travel Times (minutes)	7 to 8	7 to 8	7 to 8	7 to 8	7 to 8
Improve regional mobility by increasing connectivity and capacity through downtown Seattle to meet projected transit demand.					
Network Integration	Medium	Medium	Medium	Medium	Medium
Passenger Carrying Capacity	Medium	Medium	Medium	Medium	Medium
Ridership Potential (2040 pop/emp) (1)	11,200	12,500	12,000	10,700	12,500
Connect regional centers as described in adopted regional and local land use, transportation, and economic development plans and Sound Transit's Long-Range Plan.					
Regional Growth Centers Served	N/A (3)	N/A	N/A	N/A	N/A
Manufacturing/Industrial Centers Served	1	1	1	1	1
Accommodates Future LRT Extension	Lower	Medium	Lower	Higher	Medium
Implement a system that is consistent with the ST3 Plan that established transit mode, corridor, and station locations and that is technically feasible and financially sustainable to build, operate, and maintain.					
Mode, Route and Stations per ST3	Higher	Higher	Higher	Medium	Higher
Potential ST3 Schedule Effects	Higher	Lower	Higher	Lower	Lower
Potential ST3 Operating Plan Effects	Higher	Higher	Higher	Higher	Higher
Engineering Constraints	Medium	Lower	Medium	Medium	Higher
Constructability Issues	Lower	Lower	Lower	Lower	Medium
Operational Constraints	Medium	Higher	Medium	Medium	Medium
Conceptual Capital Cost Comparison	-	$1,200M increase	Similar	$700M increase	$500M increase
Operating Cost Impacts	Higher	Medium	Higher	Medium	Medium
Expand mobility for the corridor and region's residents, which include transit dependent, low income, and minority populations.					
Opportunities for Low-Income/Minority (activity nodes/subsidized rental units) (1)	Medium 15%	Medium 13%	Medium 14%	Medium 15%	Medium 13%
Low-Income Population (1/2)	25% / 21%	24% / 21%	23% / 21%	26% / 21%	23% / 21%
Minority Population (1/2)	22% / 26%	23% / 26%	21% / 26%	23% / 26%	21% / 26%
Youth Population (1/2)	13% / 17%	14% / 17%	14% / 17%	13% / 17%	14% / 17%
Elderly Population (1/2)	16% / 13%	15% / 13%	15% / 13%	16% / 13%	15% / 13%
Limited English Proficiency Population (1/2)	3% / 4%	3% / 4%	3% / 4%	3% / 4%	3% / 4%
Disabled Population (1/2)	9% / 9%	9% / 9%	9% / 9%	9% / 9%	9% / 9%

(1) Within station walksheds
(2) Within 15 minute ride on connecting high frequency transit
(3) NA = Measure not applicable to this segment

Lower Performing | Medium Performing | Higher Performing

West Seattle/Duwamish

Level 2 alternatives evaluation – *Part 1 of 2*

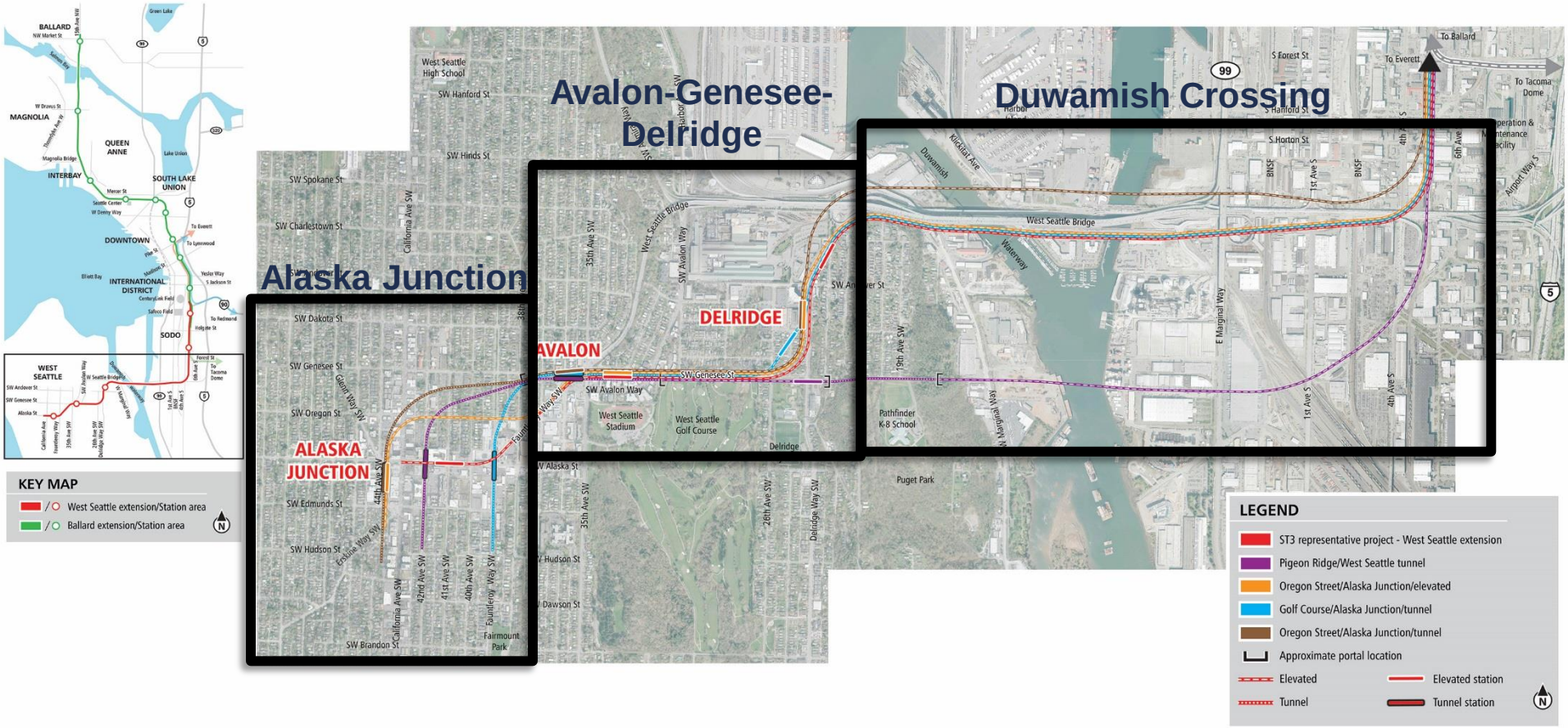
Evaluation Measures	ST3 Representative Project	Pigeon Ridge/West Seattle Tunnel	Oregon Street/Alaska Junction/ Elevated	Golf Course/Alaska Junction/ Tunnel	Oregon Street/Alaska Junction/ Tunnel
Encourage equitable and sustainable urban growth in station areas through support of transit-oriented development, station access, and modal integration in a manner that is consistent with local land use plans and policies.					
Compatibility with Urban Centers/Villages (1)	Medium	Medium	Medium	Medium	Lower
Station Land Use Plan Consistency	Higher	Higher	Higher	Higher	Higher
Activity Nodes Served (1)	40	41	42	38	42
Passenger Transfers	Medium	Higher	Medium	Medium	Higher
Bus/Rail and Rail/Rail Integration (1)	Medium	Higher	Medium	Medium	Higher
Bicycle Accessibility (1)	Higher	Higher	Higher	Higher	Higher
Pedestrian/Limited Mobility Accessibility (1)	Medium	Higher	Higher	Higher	Higher
Development Potential (1)	Medium	Medium	Medium	Higher	Medium
Equitable Development Opportunities	Lower	Lower	Medium	Medium	Higher
Preserve and promote a healthy environment and economy by minimizing adverse impacts on the natural, built and social environments through sustainable practices.					
Historic Properties/Landmarks (2)	1	1	1	1	2
Potential for effects to Archaeological Resources (1)	Lower	Lower	Lower	Lower	Lower
Parks and Recreational Resources Effects (acres)	1.5	3.5	1.5	2.8	0.6
Water Resource Effects (acres)	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fish and Wildlife Habitat Effects (acres)	3.7	5.3	3.7	3.7	1.9
Hazardous Materials Sites (1)	11	7	8	14	14
Visual Effects	Lower	Medium	Lower	Medium	Medium
Noise and Vibration Sensitive Receivers (1)	Lower	Lower	Lower	Medium	Lower
Potentially Affected Properties	Higher	Higher	Lower	Higher	Lower
Residential Unit Displacements	Medium	Lower	Lower	Higher	Lower
Square Feet of Business Displacements	Higher	Medium	Lower	Higher	Medium
Construction Impacts	Lower	Higher	Lower	Medium	Medium
Burden on Low-Income/Minority	Higher	Higher	Higher	Higher	Higher
Traffic Circulation and Access Effects	Lower	Higher	Medium	Higher	Medium
Effects on Existing Transportation Facilities	Lower	Higher	Medium	Medium	Higher
Effects on Freight Movement	Medium	Medium	Medium	Medium	Lower
Business and Commerce Effects	Medium	Higher	Lower	Medium	Medium

(1) Within station walksheds and/or defined buffer of alignment
(2) On properties that overlap with the project footprint

Lower Performing | Medium Performing | Higher Performing

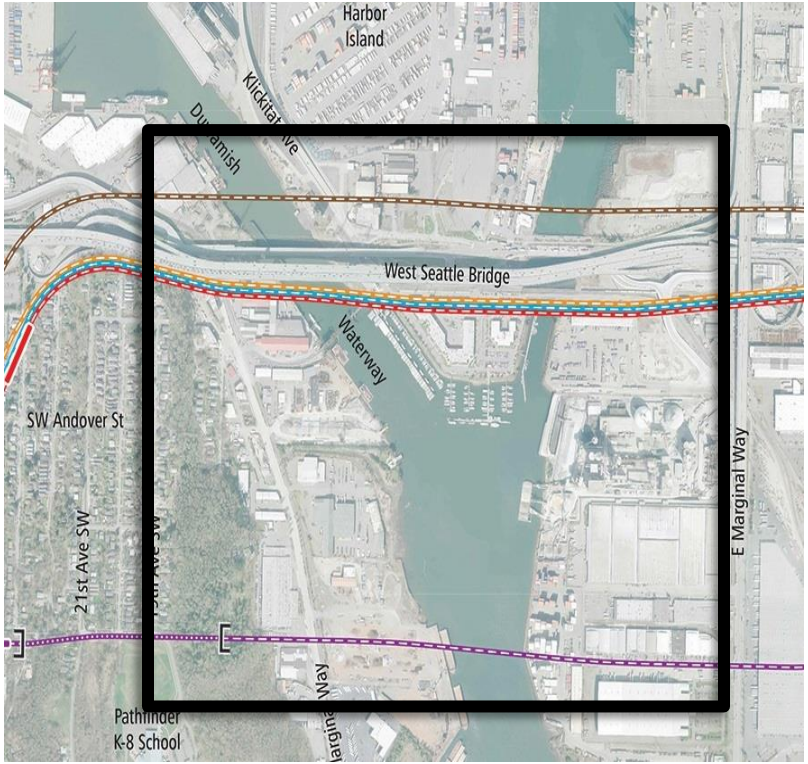
West Seattle/Duwamish

Level 2 alternatives evaluation – *Part 2 of 2*



West Seattle/Duwamish

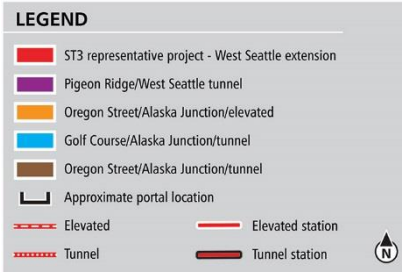
Key differentiators – *By sub-segment*



Duwamish Crossing:

Key differentiators

- Crossing location
- Engineering constraints
- Fish and wildlife effects
- Freight movement



West Seattle/Duwamish

Key differentiators – *Duwamish Crossing*

Key differentiators Duwamish Crossing

Alternative	Key differentiators
ST3 Representative Project	
Pigeon Ridge / West Seattle Tunnel	Bridge crossing near Idaho Street; south of Harbor Island Most engineering constraints (tunnel through unstable slopes, widest water crossing, wide Union Pacific Argo railyard crossing, high voltage lines etc.) Most effects to Duwamish Greenbelt
Oregon Street / Alaska Junction / Elevated	Bridge crossing on south side of West Seattle bridge Some engineering constraints (Pigeon Point steep slope) Some effects to Duwamish Greenbelt (Pigeon Point)
Golf Course / Alaska Junction / Tunnel	
Oregon Street / Alaska Junction / Tunnel	Bridge crossing on north side of West Seattle bridge Fewer engineering constraints (avoids Pigeon Point steep slope) Avoids effects to Duwamish Greenbelt Affects freight, port terminal facilities during construction

Summary West Seattle / Duwamish

Alternative	Key findings	Cost comparison*	Schedule comparison*
ST3 Representative Project			
Oregon Street / Alaska Junction / Elevated	• 3 elevated stations • Increases residential/business effects at Junction • Complicates future extension south • High guideway along Genesee	Similar	Higher Performing
Oregon Street / Alaska Junction / Tunnel	• 1 tunnel station; 2 elevated stations • High guideway along Genesee • Fewer engineering constraints • Affects freight, port terminal facilities during construction • Includes tunnel; requires 3rd Party funding	+ $500M	Lower Performing
Golf Course / Alaska Junction / Tunnel	• 2 tunnel stations; 1 elevated station • Lessens residential/business effects at Junction • Low guideway along Genesee • Includes tunnel; requires 3rd Party funding	+ $700M	Lower Performing
Pigeon Ridge / West Seattle Tunnel	• 2 tunnels; 2 tunnel stations; 1 elevated station • Most engineering constraints • Most effects to Duwamish Greenbelt • Low guideway along Genesee • Lessens residential and business effects in Delridge • Includes two tunnels; requires 3rd Party funding	+ $1,200M	Lower Performing

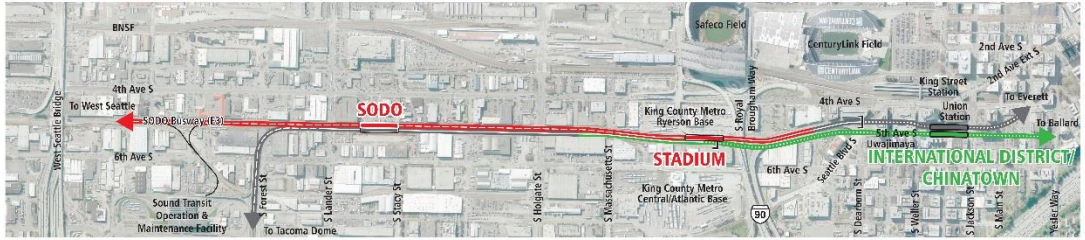
*Cost compared to cost of ST3 Representative Project for this segment. Schedule compared to overall ST3 schedule for this extension.

Level 2 alternatives

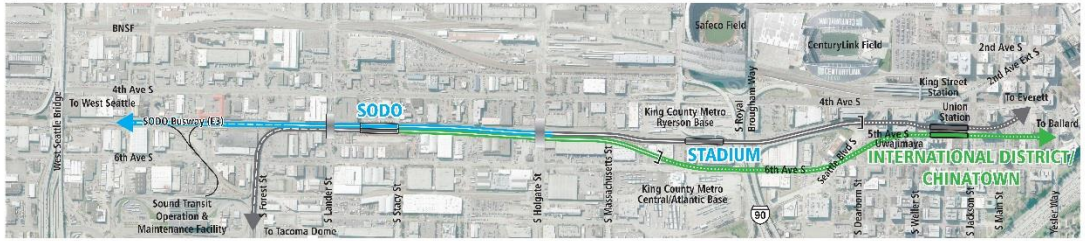
SODO/Chinatown-ID

- ST3 Representative Project
- Massachusetts Tunnel Portal
- Surface E-3
- 4th Avenue Cut-and-Cover C-ID
- 4th Avenue Mined C-ID
- 5th Avenue Mined C-ID
- Occidental Avenue

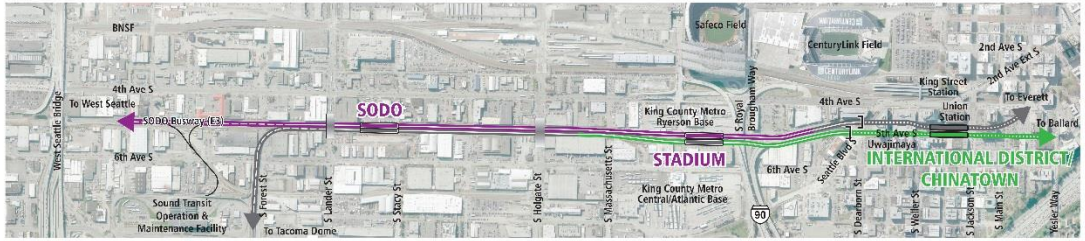
ST3 Representative Pr

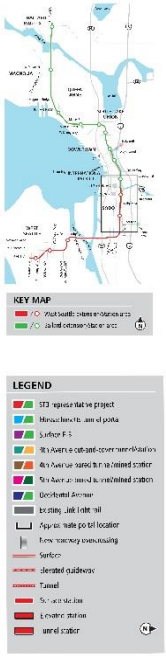


Massachusetts Tunnel



Surface E-3



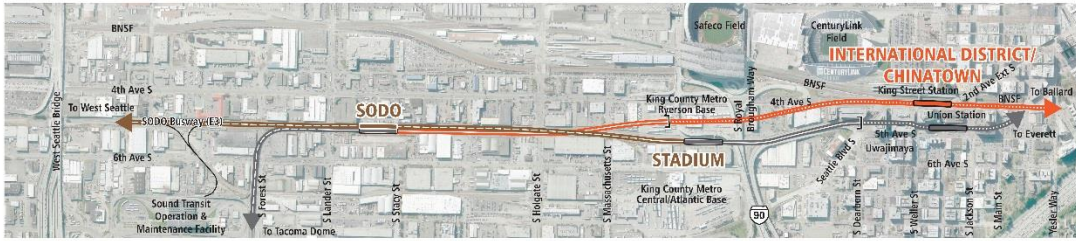


SODO and Chinatown-ID

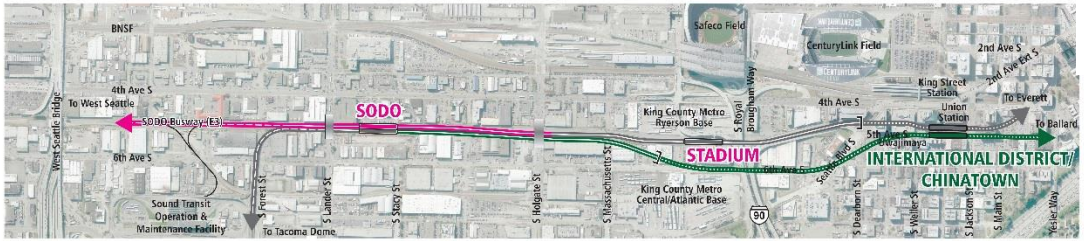
Level 2 alternatives – *1 of 3*

4th Avenue Cut-and-Cover C-ID

4th Avenue Mined C-ID



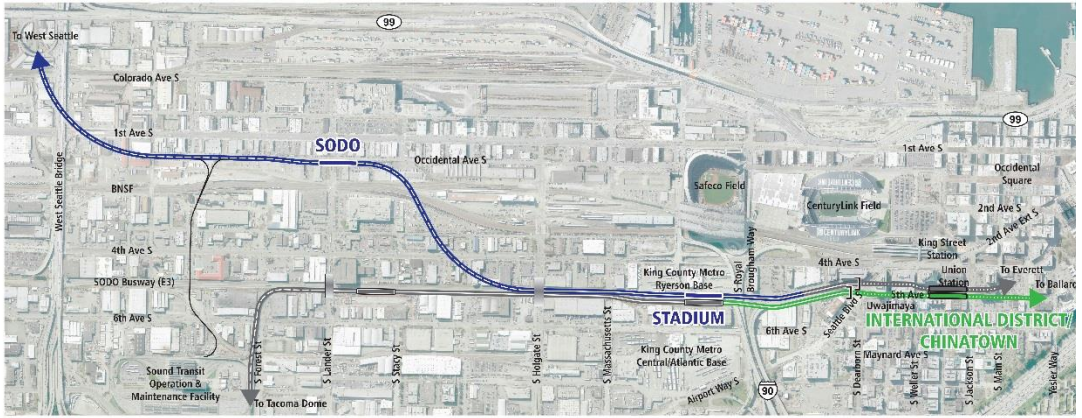
5th Avenue Mined C-ID

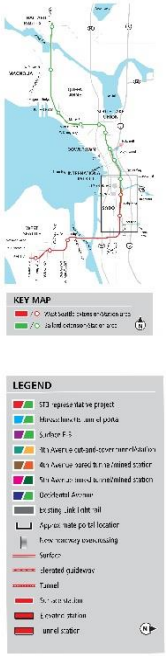


SODO and Chinatown-ID

Level 2 alternatives – *2 of 3*

Occidental Avenue





SODO and Chinatown-ID

Level 2 alternatives – *3 of 3*

Evaluation Measures	ST3 Representative Project	Massachusetts Tunnel Portal	Surface E-3	4th Avenue Cut-and-Cover C-ID	4th Avenue Mined C-ID	5th Avenue Mined C-ID	Occidental Avenue
Provide high quality rapid, reliable, and efficient peak and off-peak light rail transit service to communities in the project corridors defined in ST3.							
Potential Service Interruptions	Lower	Medium	Higher	Lower	Lower	Medium	Higher
Travel Times (minutes)	3 to 4	3 to 4	3 to 4	3 to 4	3 to 4	3 to 4	3 to 4
Improve regional mobility by increasing connectivity and capacity through downtown Seattle to meet projected transit demand.							
Network Integration	Medium	Medium	Higher	Medium	Medium	Medium	Medium
Passenger Carrying Capacity	Medium	Medium	Medium	Medium	Medium	Medium	Medium
Ridership Potential (2040 pop/emp) (1)	35,900	35,900	35,900	35,300	35,300	35,900	37,100
Connect regional centers as described in adopted regional and local land use, transportation, and economic development plans and Sound Transit's Long-Range Plan.							
Regional Growth Centers Served	N/A (3)	N/A	N/A	N/A	N/A	N/A	N/A
Manufacturing/Industrial Centers Served	1	1	1	1	1	1	1
Accommodates Future LRT Extension	Medium	Medium	Medium	Medium	Medium	Medium	Medium
Implement a system that is consistent with the ST3 Plan that established transit mode, corridor, and station locations and that is technically feasible and financially sustainable to build, operate, and maintain.							
Mode, Route and Stations per ST3	Higher	Higher	Higher	Higher	Higher	Higher	Medium
Potential ST3 Schedule Effects	Higher	Higher	Higher	Lower	Lower	Medium	Higher
Potential ST3 Operating Plan Effects	Medium	Medium	Higher	Higher	Lower	Medium	Higher
Engineering Constraints	Medium	Medium	Medium	Lower	Lower	Medium	Lower
Constructability Issues	Medium	Medium	Medium	Lower	Lower	Medium	Lower
Operational Constraints	Medium	Medium	Higher	Medium	Lower	Medium	Medium
Conceptual Capital Cost Comparison	-	$200M decrease	$400M decrease	$600M increase	$500M increase	Similar	Similar (+ $200M in SODO)
Operating Cost Impacts	Medium	Medium	Higher	Medium	Medium	Medium	Medium
Expand mobility for the corridor and region's residents, which include transit dependent, low income, and minority populations.							
Opportunities for Low-Income/Minority (activity nodes/subsidized rental units) (1)	Higher 80%	Higher 80%	Higher 80%	Higher 75%	Higher 75%	Higher 80%	Higher 73%
Low-Income Population (1/2)	59% / 49%	59% / 49%	59% / 49%	57% / 49%	57% / 49%	59% / 49%	58% / 49%
Minority Population (1/2)	65% / 54%	65% / 54%	65% / 54%	63% / 54%	63% / 54%	65% / 54%	65% / 53%
Youth Population (1/2)	7% / 7%	7% / 7%	7% / 7%	6% / 7%	6% / 7%	7% / 7%	7% / 8%
Elderly Population (1/2)	20% / 19%	20% / 19%	20% / 19%	20% / 19%	20% / 19%	20% / 19%	20% / 19%
Limited English Proficiency Population (1/2)	30% / 19%	30% / 19%	30% / 19%	28% / 19%	28% / 19%	30% / 19%	30% / 18%
Disabled Population (1/2)	24% / 19%	24% / 19%	24% / 19%	25% / 19%	25% / 19%	24% / 19%	24% / 19%

(1) Within station walksheds
(2) Within 15 minute ride on connecting high frequency transit
(3) NA = Measure not applicable to this segment

Lower Performing | Medium Performing | Higher Performing

SODO and Chinatown-ID

Level 2 alternatives evaluation – *Part 1 of 2*

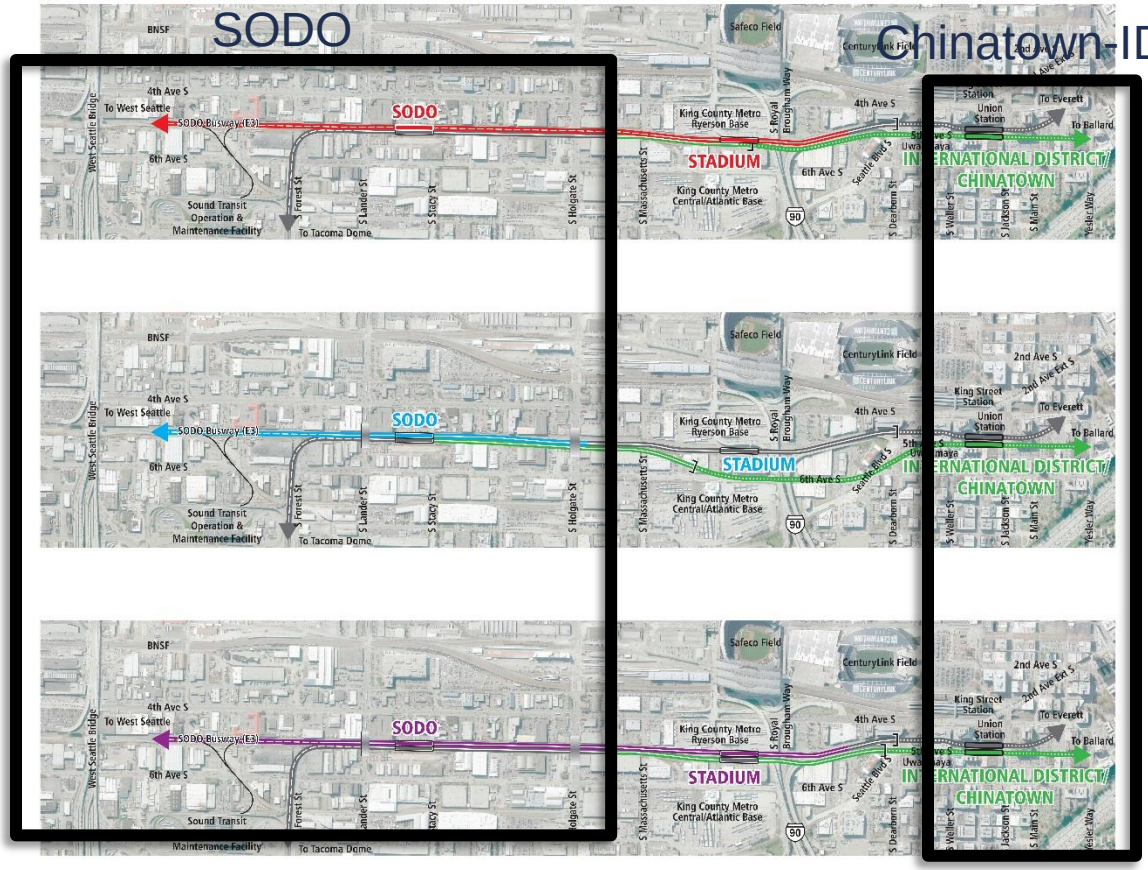
Evaluation Measures	ST3 Representative Project	Massachusetts Tunnel Portal	Surface E-3	4th Avenue Cut-and-Cover C-ID	4th Avenue Mined C-ID	5th Avenue Mined C-ID	Occidental Avenue
Encourage equitable and sustainable urban growth in station areas through support of transit-oriented development, station access, and modal integration in a manner that is consistent with local land use plans and policies.							
Compatibility with Urban Centers/Villages (1)	Medium	Medium	Medium	Medium	Medium	Medium	Medium
Station Land Use Plan Consistency	Medium	Medium	Medium	Medium	Medium	Medium	Medium
Activity Nodes Served (1)	57	57	57	54	54	57	56
Passenger Transfers	Higher	Medium	Medium	Medium	Lower	Lower	Medium
Bus/Rail and Rail/Rail Integration (1)	Medium	Medium	Medium	Medium	Medium	Medium	Medium
Bicycle Accessibility (1)	21%	21%	21%	21%	21%	21%	21%
Pedestrian/Limited Mobility Accessibility (1)	Medium	Medium	Medium	Medium	Medium	Medium	Medium
Development Potential (1)	14%	14%	14%	13%	13%	14%	15%
Equitable Development Opportunities	Lower	Medium	Lower	Medium	Lower	Medium	Higher
Preserve and promote a healthy environment and economy by minimizing adverse impacts on the natural, built and social environments through sustainable practices.							
Historic Properties/Landmarks (2)	3	2	3	5	2	3	3
Potential for effects to Archaeological Resources (1)	Lower	Lower	Lower	Lower	Lower	Lower	Lower
Parks and Recreational Resources Effects (acres)	0	0	0	0	0	0	0
Water Resource Effects (acres)	0	0	0	0	0	0	0
Fish and Wildlife Habitat Effects (acres)	0	0	0	0	0	0	0
Hazardous Materials Sites (1)	4	9	4	5	9	9	6
Visual Effects	Higher	Higher	Higher	Higher	Higher	Higher	Higher
Noise and Vibration Sensitive Receivers (1)	Medium	Medium	Medium	Medium	Medium	Medium	Medium
Potentially Affected Properties	Medium	Medium	Medium	Medium	Medium	Medium	Medium
Residential Unit Displacements	Medium	Medium	Medium	Medium	Medium	Medium	Medium
Square Feet of Business Displacements	Higher	Lower	Higher	Lower	Higher	Lower	Lower
Construction Impacts	Lower	Higher	Medium	Lower	Lower	Higher	Medium
Burden on Low-Income/Minority	Medium	Medium	Medium	Lower	Lower	Higher	Medium
Traffic Circulation and Access Effects	Medium	Higher	Medium	Lower	Medium	Higher	Medium
Effects on Existing Transportation Facilities	Lower	Higher	Medium	Lower	Lower	Higher	Medium
Effects on Freight Movement	Medium	Higher	Medium	Lower	Lower	Higher	Lower
Business and Commerce Effects	Medium	Medium	Medium	Medium	Medium	Higher	Lower

(1) Within station walksheds and/or defined buffer of alignment
(2) On properties that overlap with the project footprint

Lower Performing | Medium Performing | Higher Performing

SODO and Chinatown-ID

Level 2 alternatives evaluation – *Part 2 of 2*



SODO and Chinatown-ID

Key differentiators – *By sub-segment*

Summary SODO

Alternative	Key findings	Cost comparison*	Schedule comparison*
ST3 Representative Project			
Surface E-3	• New at-grade SODO Station on E-3 transitway at Lander • Transfer at existing SODO Station • Bus operations on E-3 transitway displaced • New grade-separated roadway crossings (Lander, Holgate) improve existing rail/traffic/freight operations • Property effects at tunnel portal site (for Massachusetts Tunnel Portal alternative only) • Massachusetts Tunnel Portal alternative avoids impacts to Ryerson Base	- $100M	Higher Performing
Massachusetts Tunnel Portal		**	Higher Performing
Occidental Ave.	• New elevated SODO Station on Occidental Ave at Lander • Transfer at existing Stadium Station • Long span bridges over BNSF tracks and longer track connection to maintenance facility • Bus operations on E-3 transitway partially displaced • Property effects along Occidental, BNSF crossings and maintenance facility connection	+ $200M	Higher Performing

*Cost compared to cost of ST3 Representative Project for this SODO sub-segment only. Schedule compared to overall ST3 schedule for this extension.
**Cost comparison reflected in Chinatown/ID summary table.

Summary Chinatown-ID

Alternative	Key findings	Cost comparison*	Schedule comparison*
ST3 Representative Project			
E-3 Surface (shorter 5th Ave Cut-and-Cover Tunnel)	• Shallow cut-and-cover station under 5th Ave; easy rider access/transfers • Construction effects, lane closures on 5th Ave in station area	- $300M**	Higher Performing
Massachusetts Tunnel Portal (5th Ave Bored Tunnel)	• Shallow cut-and-cover station under 5th Ave; easy rider access/transfers • Construction effects, lane closures on 5th Ave in station area	- $200M	Higher Performing
5th Ave Mined C-ID	• Deep mined station (~200') under 5th Ave; poor rider access/transfers • Less construction effects, lane closures on 5th Ave with mined station • Some property effects (for mined station access shaft) • Results in very deep Midtown Station (~250')	Similar	Medium Performing
4th Ave Mined C-ID	• Deep mined station (~200') under 4th Ave, poor rider access/transfers • Major engineering/constructability constraints (4th Ave viaduct demolition/rebuild, active BNSF railway, existing transit tunnel, etc.) • Large property effects (Ryerson Base for tunnel portal site) • Requires 3rd party funding of 4th Ave Viaduct re-build costs • Results in very deep Midtown Station (~250')	+ $500M	Lower Performing
4th Ave Cut-and-Cover C-ID	• Shallow cut-and-cover station under 4th Ave; easy rider access/transfers • Major engineering/constructability constraints (4th Ave viaduct demolition/rebuild, active BNSF railway, existing transit tunnel, etc.) • Large property effects (King County Admin Building) • Requires 3rd party funding of 4th Ave Viaduct re-build costs	+ $600M	Lower Performing

*Cost compared to cost of ST3 Representative Project for this segment. Schedule compared to overall ST3 schedule for this extension.

**Cost comparison for Chinatown/ID sub-segment only; total SODO/C-ID segment cost difference is - $400M compared to ST3 Representative Project.

Key POS, NWSA Evaluation Criteria and Measures

Economic Effects

- Freight movement and access on land and water
- Business and commerce effects

Regional Mobility

- Transit connectivity
- Ridership demand

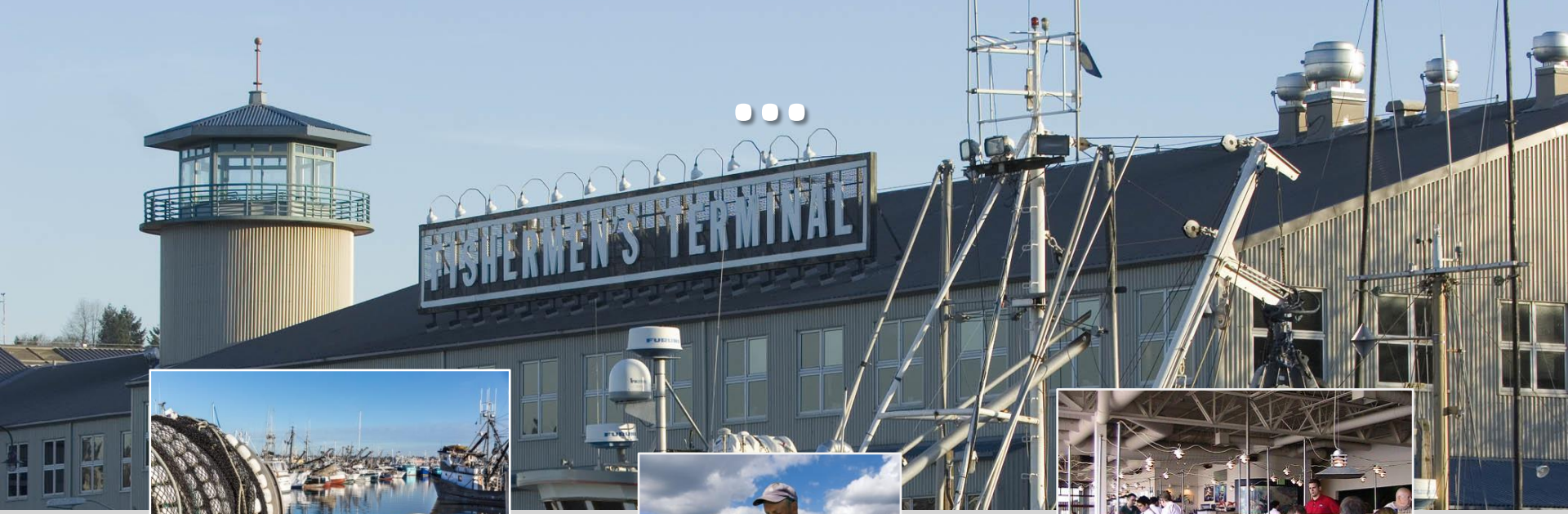
Transportation Operations

- Traffic circulation and access
- Transportation facilities

Environmental Effects

- Water resources
- Property acquisitions and displacements
- Construction impacts

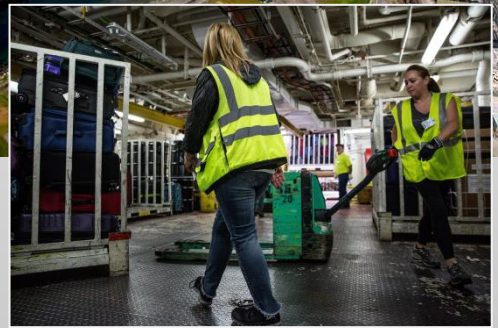
Possible impacts to operations and facilities



Homeport to the Alaska fishing fleet & a vibrant commercial destination

6,419 Local jobs and $449 million in business revenue

Terminal 91



Blends fishing and cruise operations throughout the year

Cruise ship homeport generates $2.7 million and provides over 4,000 jobs

International Container Trade

Marine cargo operations provides $379 million in state and local taxes

Nearly $4.3 billion in economic activity and more than 48,000 jobs

Key Dates

- Stakeholder Advisory Group Level 2 recommendations – **September 26**
- Elected Leadership Group (ELG) Level 2 recommendations – **October 5**
- EIS scoping period – **February 2019**
  - SEPA process expected 2019 - 2022
- ELG preferred alternative recommendation – **March 22, 2019**
- ST Board identification of preferred alternative – **April 2019**