



West Seattle and Ballard Link Extensions

Board Meeting | October 25, 2018



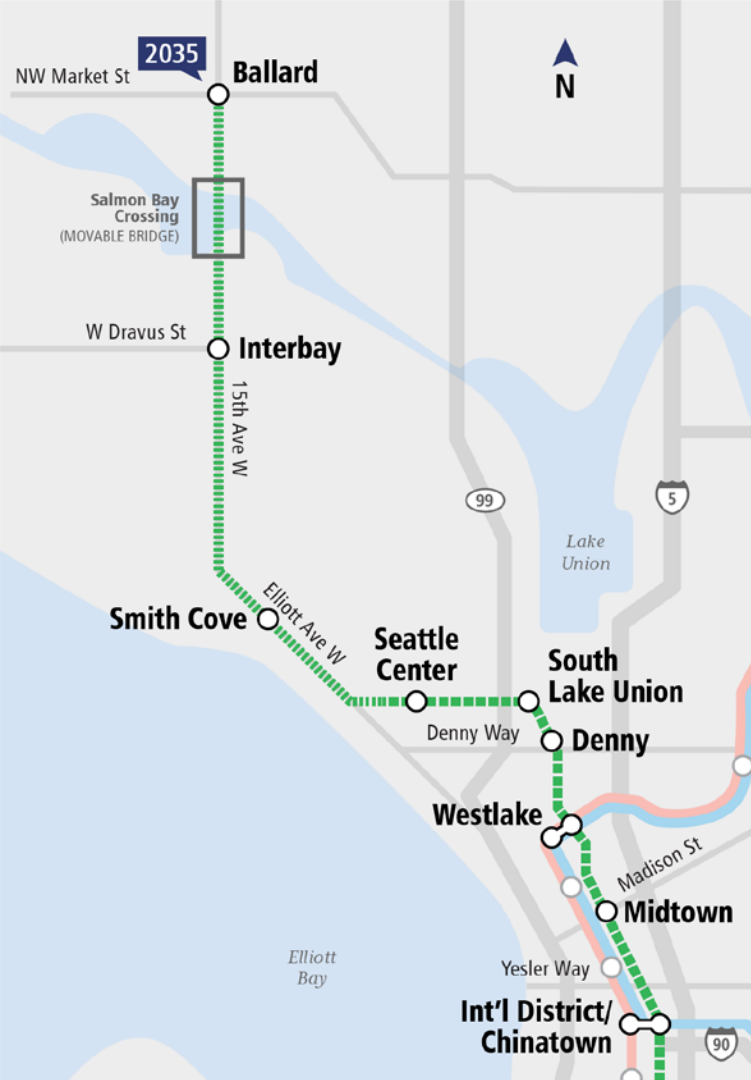
ST3 Representative project

- 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

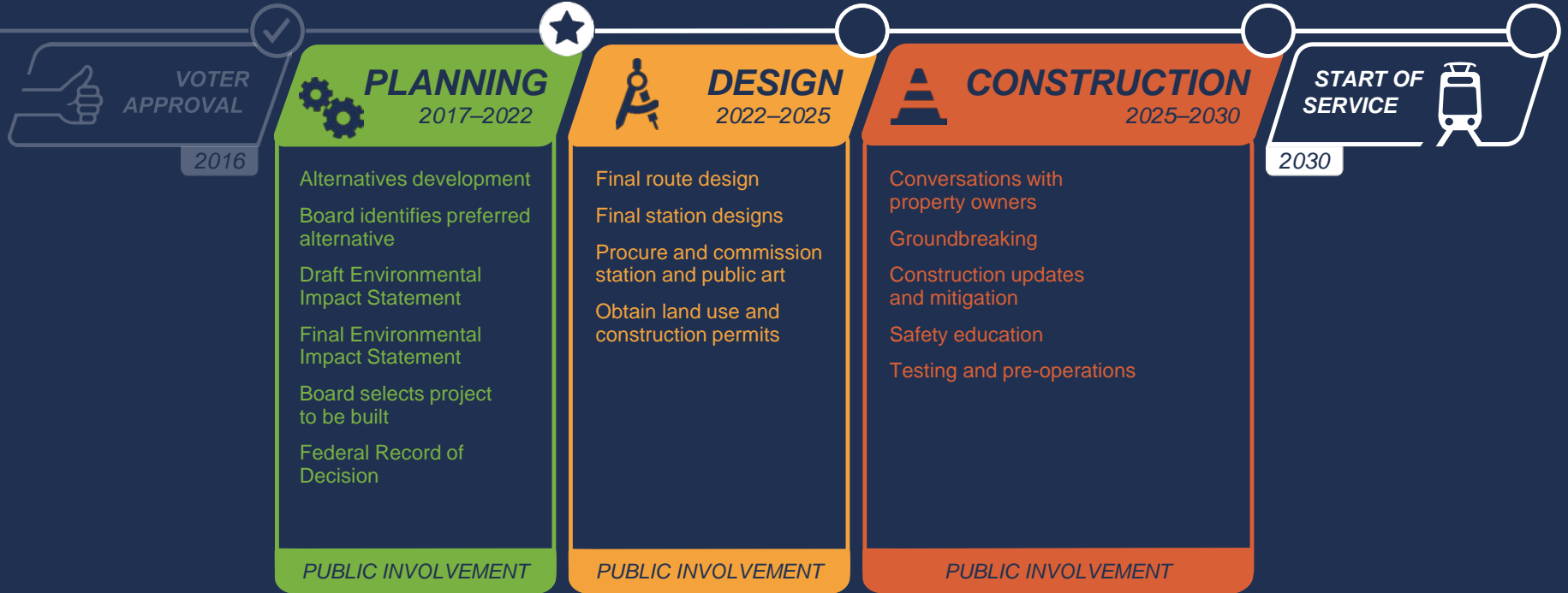




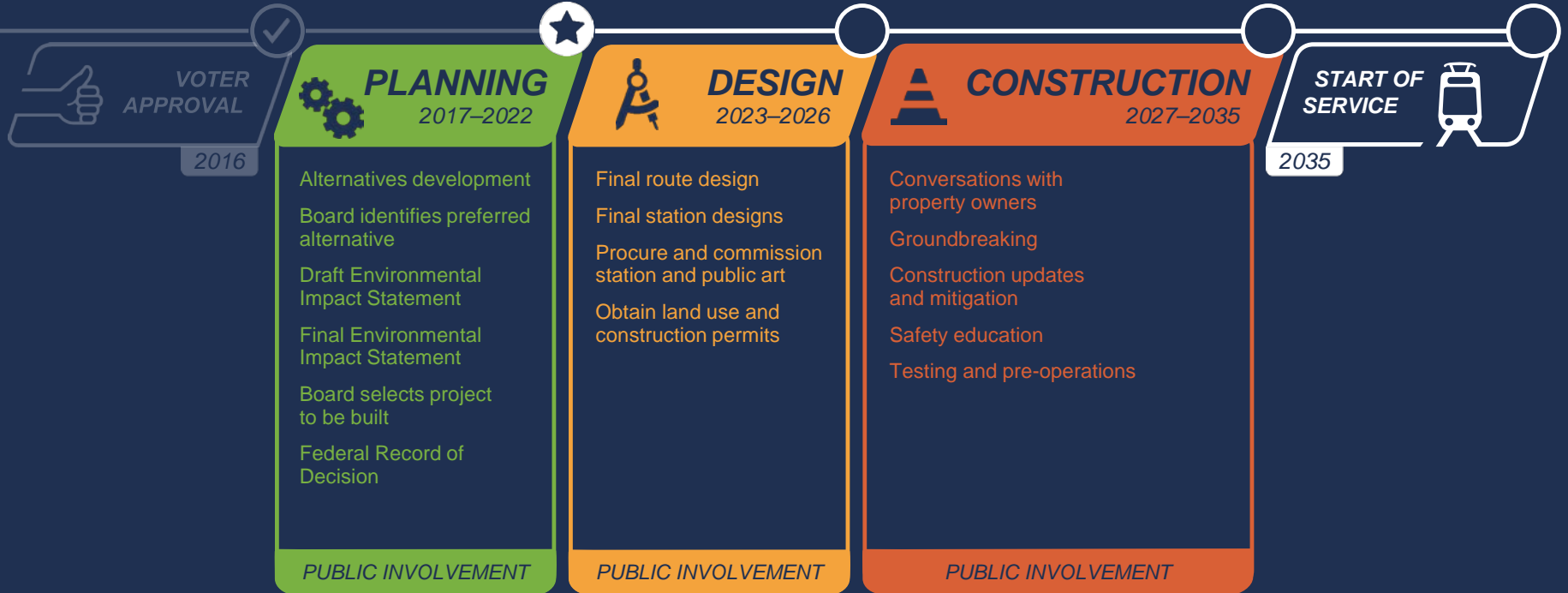
Ballard Link Extension

- 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



Community engagement and collaboration



Meeting dates subject to change.

External Engagement Report: June-Sept. 2018



66 community briefings



11 festivals

engaging more than
3,800 community
members



4 Stakeholder Advisory Group meetings



2 Elected Leadership Group meetings



3 neighborhood forums



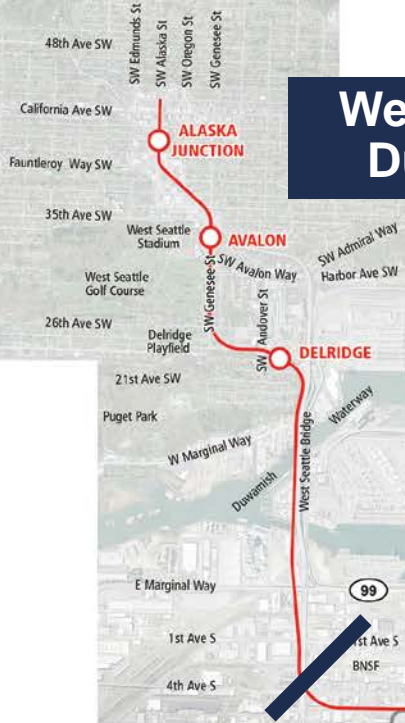
1 online open house



9 email updates

engaging more than
4,000 subscribers

West Seattle/ Duwamish



SODO & Chinatown/ID



Downtown



Interbay/Ballard



KEY MAP

- Red line / Red circle: West Seattle extension/Station area
- Green line / Green circle: Ballard extension/Station area
- Grey line / Grey circle: Existing Link/Station area

Study segments



Level 2 alternatives

2

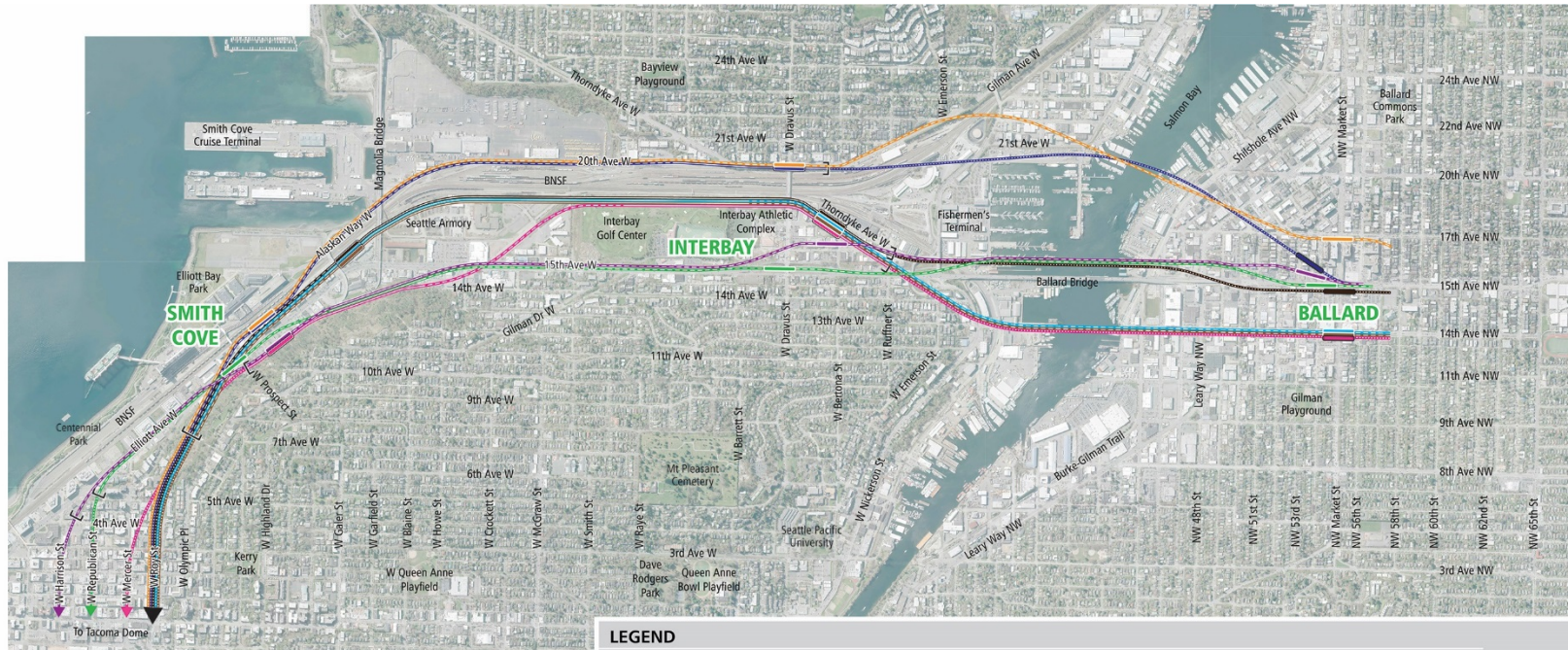
	Key findings	Cost comparison*	Schedule comparison*
ST3 Representative Project			
Alternative 1	<ul style="list-style-type: none"> Key finding Key finding Key finding 	-\$XXXM	Medium Performing
Alternative 2	<ul style="list-style-type: none"> Key finding Key finding Key finding 	+\$XXXM	Lower Performing

Results summary

3

Alternative	Public feedback - common themes	Do Not Carry Forward?	Carry Forward?
ST3 Representative Project			
Alternative 1	<ul style="list-style-type: none"> No support for this alternative 		
Alternative 2	<ul style="list-style-type: none"> Support for this alternative 		
Alternative 3	<ul style="list-style-type: none"> Some support for this alternative 		

ELG recommendations











LEGEND

ST3 representative project - Ballard extension	Armory Way/tunnel/14th	Approximate portal location
15th/fixed bridge/15th	Central Interbay/fixed bridge/14th	Surface station
20th/fixed bridge/17th	Central Interbay/tunnel/15th	Elevated guideway
20th/tunnel/15th		Tunnel
Central Interbay/movable bridge/14th		Tunnel station

Interbay / Ballard









Level 2 alternatives

Interbay / Ballard Results summary

Alternative	Key findings	Cost comparison*	Schedule Comparison**
ST3 Representative Project 			
Central Interbay/ Fixed Bridge/14 th 	<ul style="list-style-type: none"> Maritime business effects (but less than movable bridge) Affects fewer parcels in Ballard (along 14th Ave NW) 	+\$100M	Higher Performing
Central Interbay/ Movable Bridge/14 th 	<ul style="list-style-type: none"> Potential service interruptions Maritime business and potential vessel navigation effects Affects fewer parcels in Ballard (along 14th Ave NW) 	+\$200M	Higher Performing
15 th /Fixed Bridge/15 th 	<ul style="list-style-type: none"> Maritime business effects (Fishermen's Terminal) Elevated guideway (west side 15th Ave NW) affects more residences 	+\$200M	Higher Performing
Armory Way/ Tunnel/14 th 	<ul style="list-style-type: none"> 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/15 th 	<ul style="list-style-type: none"> Less environmental, maritime business/navigation effects Tunnel station (east side 15th Ave NW) affects businesses Includes tunnel; requires 3rd Party funding 	+\$500M	Higher Performing
20 th /Fixed Bridge/17 th 	<ul style="list-style-type: none"> Long span bridge (over BNSF tracks) adds complexity Ballard terminus/crossing location affects more residences 	+\$500M	Higher Performing
20 th /Tunnel/15 th 	<ul style="list-style-type: none"> 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.

Interbay / Ballard *ELG recommendations*

Alternative	Public feedback - common themes	Do Not Carry Forward?	Carry Forward?	w/suggested refinements?
ST3 Representative Project 				
Central Interbay/ Fixed Bridge/14 th 	<ul style="list-style-type: none"> Some support for fixed bridge and Ballard station with fewer property effects 		✓	
Central Interbay/ Movable Bridge/14 th 	<ul style="list-style-type: none"> Concern about movable bridges 	✓		
15 th /Fixed Bridge/15 th 	<ul style="list-style-type: none"> Concern about Fishermen's Terminal effects 	✓		
Armory Way/ Tunnel/14 th 	<ul style="list-style-type: none"> General support for more cost-effective tunnel crossing Support for Ballard station with fewer property effects <i>Explore Ballard Station access at 15th Ave NW, closer to center of urban village</i> 		✓	Explore Ballard Station access at 15 th Ave NW, closer to center of urban village
Central Interbay/ Tunnel/15 th 	<ul style="list-style-type: none"> Concern about tunnel cost vs. Armory Way/Tunnel/14th Support for 15th Ave NW station 	✓		
20 th /Fixed Bridge/17 th 	<ul style="list-style-type: none"> Concern about overall cost Concern about Ballard Station property, construction and visual effects, though support for location 	✓		
20 th /Tunnel/15 th 	<ul style="list-style-type: none"> Concern about tunnel cost vs. Armory Way/Tunnel/14th 	✓		

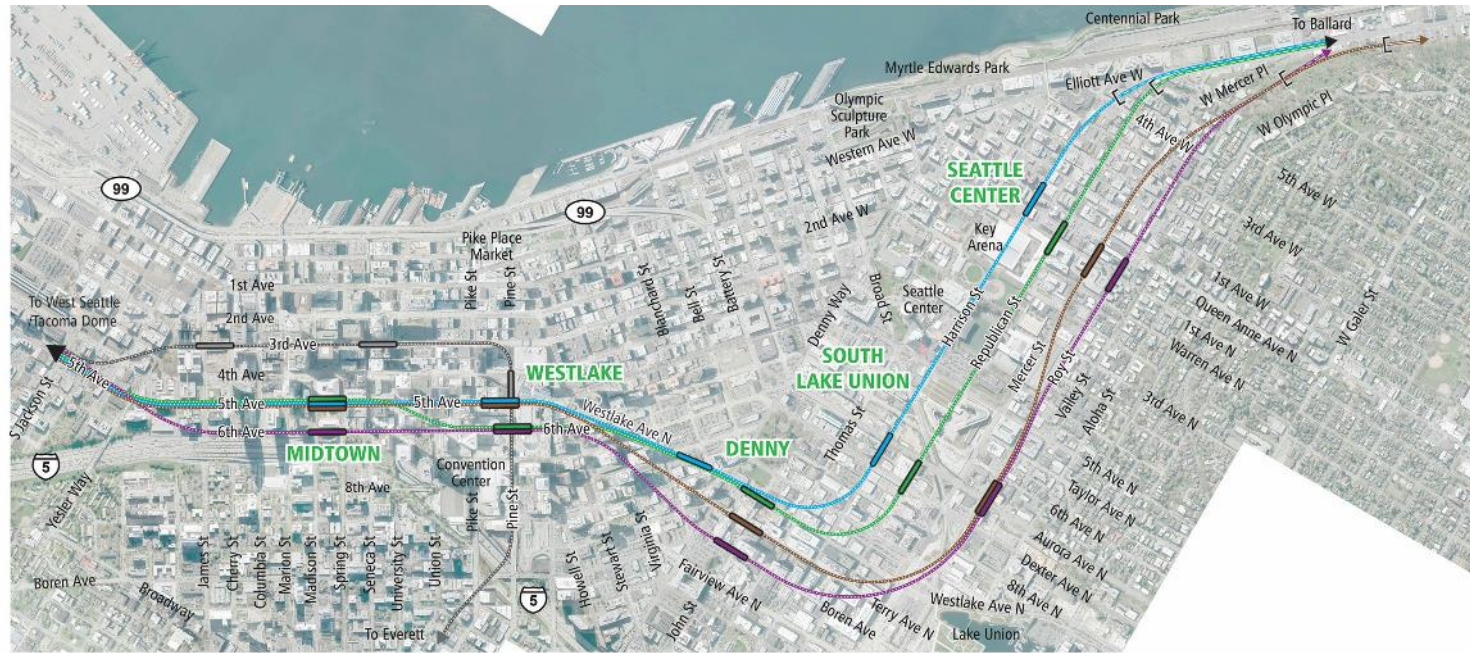
ELG Discussion – Interbay / Ballard

- *Concern with Representative Project, movable bridge and anything on 15th Ave*
- *Consider pedestrian bridge if Smith Cove Station located east of 15th Ave*
- *Concern with effects on Fishermen's Terminal*



KEY MAP

- / ○ West Seattle extension/Station area
- / ○ Ballard extension/Station area



LEGEND





- ST3 representative project - Ballard extension
- 5th/Harrison
- 5thTerry/Roy/Mercer
- 6th/Boren/Roy
- Existing Link light rail
- Approximate portal location
- Surface
- - - Elevated
- - - - - Tunnel
- Tunnel station



Downtown





Level 2 alternatives

Downtown Results summary

Alternative	Key findings	Cost comparison*	Schedule comparison*
ST3 Representative Project 			
6th/Boren/Roy 	<ul style="list-style-type: none"> Avoids building tie-backs on 5th Ave, SR 99 portal and sewer More constrained Denny station location on Boren Seattle Center station location on Roy, two blocks from Key Arena Lower bus/rail integration opportunity at Seattle Center station on Roy 	Similar	Higher Performing
5 th /Harrison 	<ul style="list-style-type: none"> Better bus/rail integration opportunity at SLU station on Harrison Higher property effects due to tunnel portal location on Harrison west of Seattle Center Engineering challenges with tunneling under Key Arena 	+\$200M	Higher Performing
5 th /Terry/Roy/Mercer 	<ul style="list-style-type: none"> Avoids SR 99 portal and sewer Seattle Center station location on Mercer, one block from Key Arena 	+\$200M	Higher Performing

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

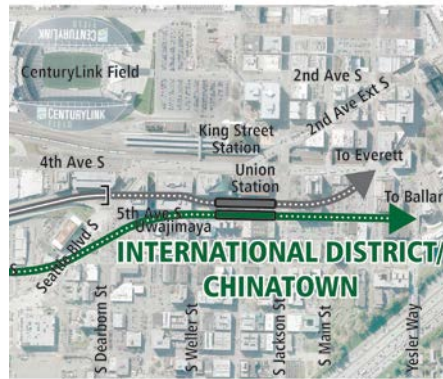
Downtown *ELG* recommendations

Alternative	Public feedback - common themes	Do Not Carry Forward?	Carry Forward?	w/suggested refinements?
ST3 Representative Project 				
6th/Boren/Roy 	<ul style="list-style-type: none"> Limited support for Denny station at Boren (due to steep grade) and South Lake Union station at Roy, but interest in maintaining 6th Ave route through Downtown 	✓		
5th/Harrison 	<ul style="list-style-type: none"> Support for this alternative with Seattle Center station located at Republican 		✓	With Seattle Center station located at Republican
5th/Terry/Roy/Mercer 	<ul style="list-style-type: none"> Some support for Denny station at Terry, with interest in 6th Ave route through Downtown 		✓	With 6th Ave route through Downtown

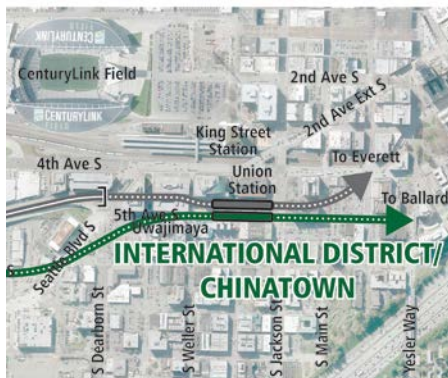
ELG Discussion – Downtown

- *Transfers at Westlake Station will be critical to serve region well*
- *Consider pedestrian safety upgrades, especially at South Lake Union station near Mercer*

Representative Project and Surface E-3



Massachusetts Tunnel Portal (5th Ave Bored Tunnel)



5th Ave Mined C-ID









4th Ave Mined C-ID



4th Ave Cut-and-Cover







Chinatown-ID Results summary

Alternative	Key findings	Cost comparison*	Schedule comparison*
ST3 Representative Project 			
Surface E-3 (shorter 5 th Ave Cut-and-Cover Tunnel) 	<ul style="list-style-type: none"> Shallow cut-and-cover station under 5th Ave; easy rider access/transfers Construction effects, parking lane closures on 5th Ave in station area 	- \$300M**	Higher Performing
Massachusetts Tunnel Portal (5 th Ave Bored Tunnel) 	<ul style="list-style-type: none"> Shallow cut-and-cover station under 5th Ave; easy rider access/transfers Construction effects, parking lane closures on 5th Ave in station area 	- \$200M	Higher Performing
5 th Ave Mined C-ID 	<ul style="list-style-type: none"> Deep mined station (~200') under 5th Ave; poor rider access/transfers Less construction effects, parking 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
4 th Ave Mined C-ID 	<ul style="list-style-type: none"> 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
4 th Ave Cut-and-Cover C-ID 	<ul style="list-style-type: none"> 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.

Chinatown-ID ELG recommendations

Alternative	Public feedback - common themes	Do Not Carry Forward?	Carry Forward?	w/suggested refinements?
ST3 Representative Project 				
Surface E-3 (shorter 5 th Ave Cut-and-Cover Tunnel) 	<ul style="list-style-type: none"> Concern about cut-and-cover tunnel construction effects 	✓		
Massachusetts Tunnel Portal (5 th Ave Bored Tunnel) 	<ul style="list-style-type: none"> Support for reduced construction effects and shallower station 		✓	
5 th Ave Mined C-ID 	<ul style="list-style-type: none"> Support for reduced construction effects Concern about access due to deep station 		✓	
4 th Ave Mined C-ID 	<ul style="list-style-type: none"> Support for closer proximity to King Street Station and reduced CID effects along 5th Ave Concern about traffic detours and access due to deep station 		✓	
4 th Ave Cut-and-Cover C-ID 	<ul style="list-style-type: none"> Support for closer proximity to King Street Station, reduced CID effects along 5th Ave and shallower station Concern about traffic detours 		✓	

ELG Discussion – Chinatown-ID

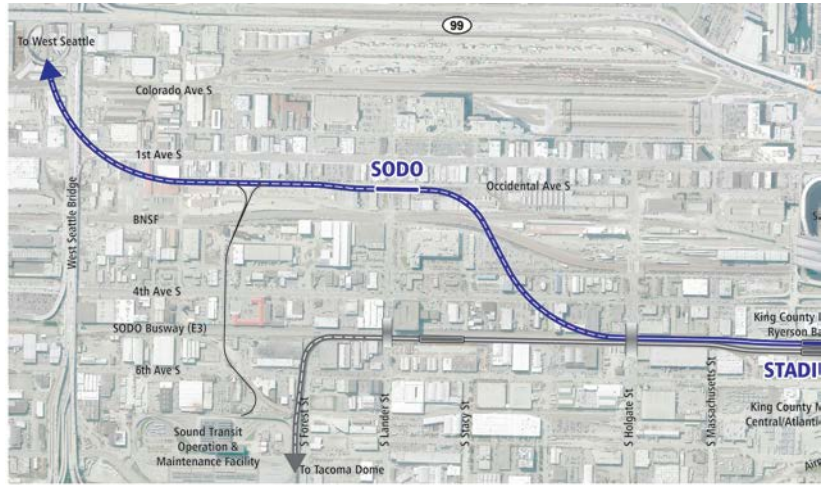
- *Must recognize historical context of impacts to community*
- *Need to interact with community about short term vs. long term impacts and benefits*
- *Interest in activating Union Station*
- *Concern with effects of displacing Ryerson bus base and effects on bus use of E-3 Transitway*
- *Concern with poor transfer environment and customer experience with deep mined stations*
- *Need more time to engage with community on options*



Surface E-3



Massachusetts Tunnel Portal



Occidental Ave.

KEY MAP





- West Seattle extension/Station area
- Ballard extension/Station area

LEGEND

- S13 representative project
- Massachusetts tunnel portal
- Surface E-3
- 4th Avenue cut-and-cover tunnel/station
- 4th Avenue tunnel station
- 5th Avenue tunnel station
- Occidental Avenue
- Existing Link light rail
- Approximate portal location
- New roadway crossing
- Surface
- Elevated guideway
- Tunnel
- Elevated station
- Tunnel station
- Surface station

SODO
Level 2 alternatives





SODO Results summary

Alternative	Key findings	Cost comparison*	Schedule comparison*
ST3 Representative Project 			
Surface E-3 	<ul style="list-style-type: none"> • 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. 	<ul style="list-style-type: none"> • 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.

SODO ELG recommendations

Alternative	Public feedback - common themes	Do Not Carry Forward?	Carry Forward?	w/suggested refinements?
ST3 Representative Project 				
Surface E-3 	<ul style="list-style-type: none"> • General support for surface alignment • Support for new roadway overpasses at Lander and Holgate • Some support for second Stadium station • <i>Explore shifting existing and new SODO stations closer to Lander</i> 		✓	
Massachusetts Tunnel Portal 	<ul style="list-style-type: none"> • General support for surface alignment • Support for new roadway overpasses at Lander and Holgate • <i>Explore shifting existing and new SODO stations closer to Lander</i> 		✓	
Occidental Ave. 	<ul style="list-style-type: none"> • Some support for locating new SODO station further west • Some concern about freight mobility and property effects 	✓		

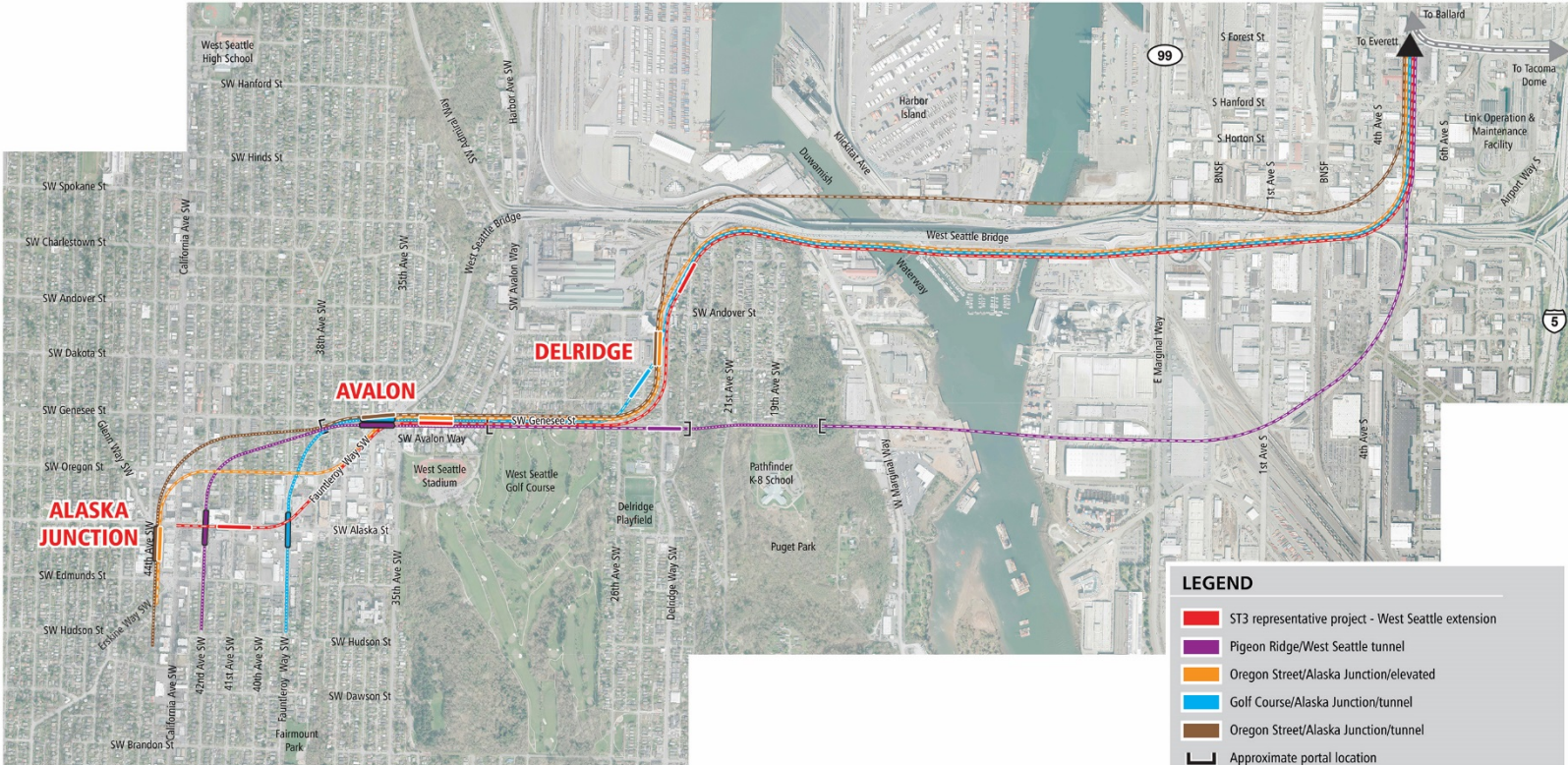
ELG Discussion – SODO

- *Need to continue analysis on interim terminus options to avoid short-term forced transfer at SODO Station if possible*
- *Need improved mobility options in SODO*
- *Strong interest in resolving limited bus base capacity*



KEY MAP

- West Seattle extension/Station area
- Ballard extension/Station area








LEGEND

- ST3 representative project - West Seattle extension
- Pigeon Ridge/West Seattle tunnel
- Oregon Street/Alaska Junction/elevated
- Golf Course/Alaska Junction/tunnel
- Oregon Street/Alaska Junction/tunnel
- Approximate portal location
- Elevated
- Tunnel
- Elevated station
- Tunnel station

West Seattle / Duwamish






Level 2 alternatives

West Seattle / Duwamish Results summary

Alternative	Key findings	Cost comparison*	Schedule comparison*
ST3 Representative Project 			
Oregon Street / Alaska Junction / Elevated 	<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • 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.

West Seattle / Duwamish *ELG recommendations*

Alternative	Public feedback - common themes	Do Not Carry Forward?	Carry Forward?	w/suggested refinements?
ST3 Representative Project 				
Oregon Street / Alaska Junction / Elevated 	<ul style="list-style-type: none"> Concern about elevated guideway across California Ave <i>If elevated, explore locating terminus station east of Junction</i> 	✓		
Oregon Street / Alaska Junction / Tunnel 	<ul style="list-style-type: none"> General support for north crossing of Duwamish due to less environmental effects; but interest in minimizing freight effects Concern about Junction station location at 44th Concern with higher guideway along Genesee <i>Explore Junction station location at 41st/42nd</i> 	✓		
Golf Course / Alaska Junction / Tunnel 	<ul style="list-style-type: none"> General support for this alternative, with development opportunities at Delridge station location to serve neighborhood Support for lower guideway along Genesee <i>Explore Junction station location at 41st/42nd</i> <i>Explore north crossing of Duwamish</i> 		✓	<p>Explore Junction station location at 41st/42nd</p> <p>Explore north crossing of Duwamish</p>
Pigeon Ridge / West Seattle Tunnel 	<ul style="list-style-type: none"> Concern about overall cost and environmental effects Support for lower guideway along Genesee and support for fewer residential effects in Delridge Support for Junction station location at 42nd 	✓		

ELG Discussion – West Seattle / Duwamish

- *Interest in good transfer environment and TOD opportunities at Delridge Station*
- *Concern with location of station on Fauntleroy; does not serve Alaska Junction well and too close to Avalon Station*
- *Concern with state freight mobility impacts of construction of Duwamish crossing north of West Seattle Bridge*
- *Adopt SAG recommendations on modifying ST3 Representative Project*
- *Explore tradeoffs with 44th Ave station location*
- *Continued interest in Junction station at 42nd Ave*



Next steps

Community engagement and collaboration



Meeting dates subject to change.



soundtransit.org/wsblink 

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