New Downtown Seattle Tunnel Analysis

Executive Committee
12/11/2025

SOUNDTRANSIT

Why we are here

Briefing purpose

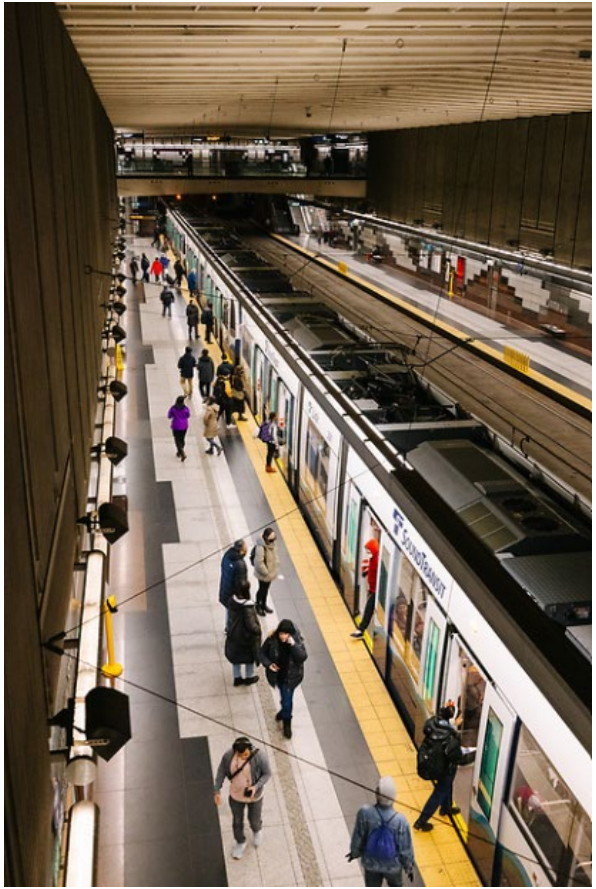
- Provide an update on staff work responding to Board questions about whether it is feasible and saves costs to use the existing downtown tunnel to operate all three future light rail lines through downtown Seattle

Briefing outline

- Background on existing tunnel, ST3 system plan, and Ballard Link Extension
- Overview of downtown tunnel study approach and findings

Study purpose

- Investigating whether all three lines could operate through the existing Downtown Seattle Transit Tunnel
- Would this be feasible and save costs while maintaining reliable service?



Scope of assessment

Construction Implications
on cost, risk, system and City construction disruptions, and other potential effect

Operational Implications
for short and long-term system performance, resilience, future expansion, operations and maintenance

Other Implications
including environmental and other delivery considerations and effects on time, cost, and risk

Caveats

- Planning level analysis; assessments of construction, operations, and other implications are preliminary
- Many components would require considerable additional study and design to validate this analysis

Background

Light rail system in 2026

After the Crosslake Connection opens

- **1 Line:** Federal Way-Lynnwood with 8-minute peak and 10-minute off-peak headways
- **2 Line:** Redmond-Lynnwood with 8-minute peak and 10-minute off-peak headways
- Combined 4-minute peak and 5-minute off-peak headways between International District and Lynnwood City Center stations.

Existing downtown tunnel overview

History

- The existing tunnel opened in 1990 as a bus-only, rail-convertible tunnel
- Extensive retrofits occurred in 2005-2007 as part of the Central Link light rail project
- Joint bus-rail operations between 2009 and 2019

Existing downtown tunnel and overall system resiliency

Current resiliency considerations

- Lack of crossovers and current signaling system are constraints that impact the resilience of the existing tunnel
- Ongoing program resiliency work will identify potential investments that can modernize the existing tunnel and extend its useful life
- Other system constraints – at-grade operations in the Rainier Valley, insufficient ventilation zones in tunnel between Westlake and Northgate – also affect service reliability and headways

Spine segmentation overview

Current expansion assumptions

- **2032:** West Seattle Link
- **2035:** Tacoma Dome Link
- **2037:** Everett Link, phase 1
- **2039:** Ballard Link + spine segmentation
  - *1 Line: Tacoma-Ballard in new tunnel*
  - *2 Line: Redmond-Mariner in existing tunnel*
  - *3 Line: West Seattle-Everett in existing tunnel*

Spine segmentation overview

Benefits

- Manageable line lengths
- Fewer maintenance facilities
- Balanced rider volumes through downtown Seattle
- Additional operational flexibility

Trade-offs

- More transfers
- Less operational choice
- Consistent fleet requirements

Ballard Link Extension

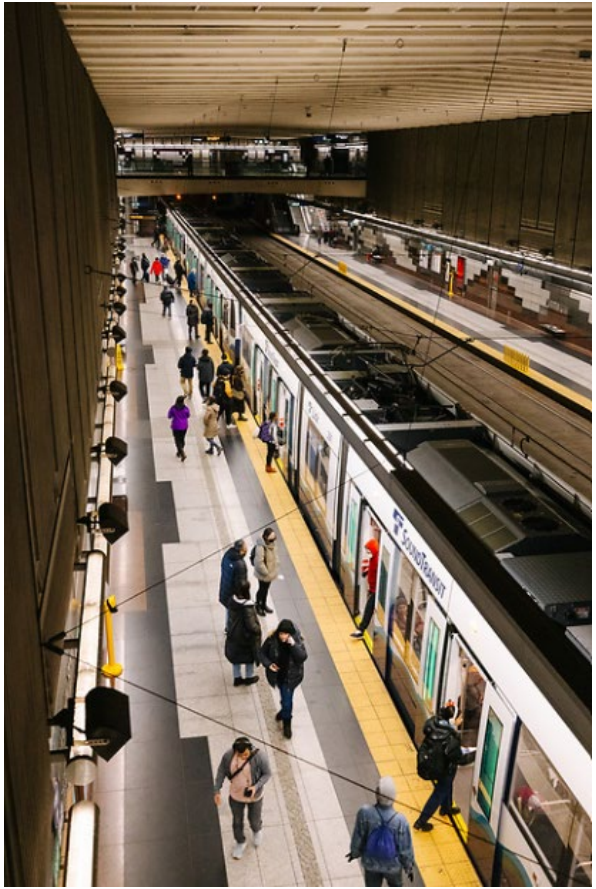
- **Provides high-quality rapid, reliable, and efficient** light rail transit service to communities in the project corridor
- **New light rail-only tunnel improves regional mobility by increasing connectivity and capacity** through Downtown Seattle
- Current cost range of **$20.1B to $22.6B in 2025$** and before any cost savings opportunities applied
- **Draft EIS publication anticipated in Q1 2026**

Adding **7.7 miles** of light rail service and **9 stations** from SODO to Ballard. Projected **139,000 daily trips** on project in 2046.

Approach

Study purpose

- Investigating whether all three lines could operate through the existing Downtown Seattle Transit Tunnel
- Would this be feasible and save costs while maintaining reliable service?
- **Reminder:** analysis is planning-level and not comprehensive



Scope of assessment

Construction Implications on cost, risk, system and City construction disruptions, and other potential effect

- Constructability
- Cost
- Risk
- Link disruptions
- City construction disruptions
- Other effects

Operational Implications for short and long-term system performance, resilience, future expansion, operations and maintenance

- Headways
- On-time performance
- Journey times
- Resilience
- Other measures

Other Implications including environmental and other delivery considerations and effects on time, cost, and risk

- Environmental process
- Delivery implications
- Future compatibility

What concepts did we look at?

1 Ballard – Tacoma
2 Mariner – Redmond
3 Everett – West Seattle
5 Ballard – Westlake
Stub-End configuration

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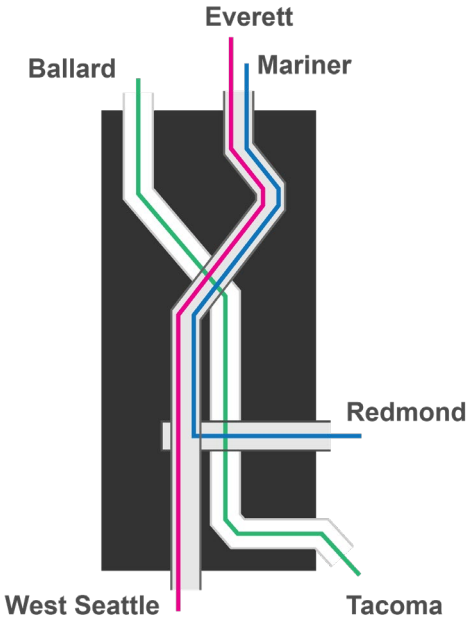
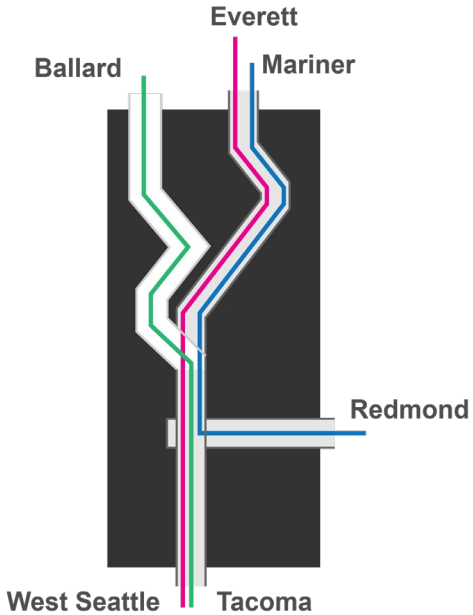
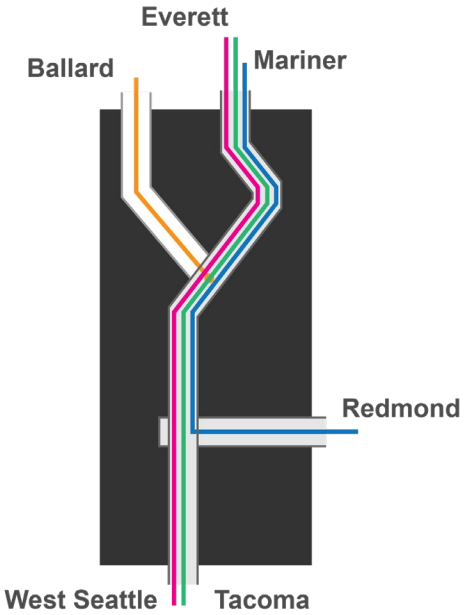


ST3 Plan



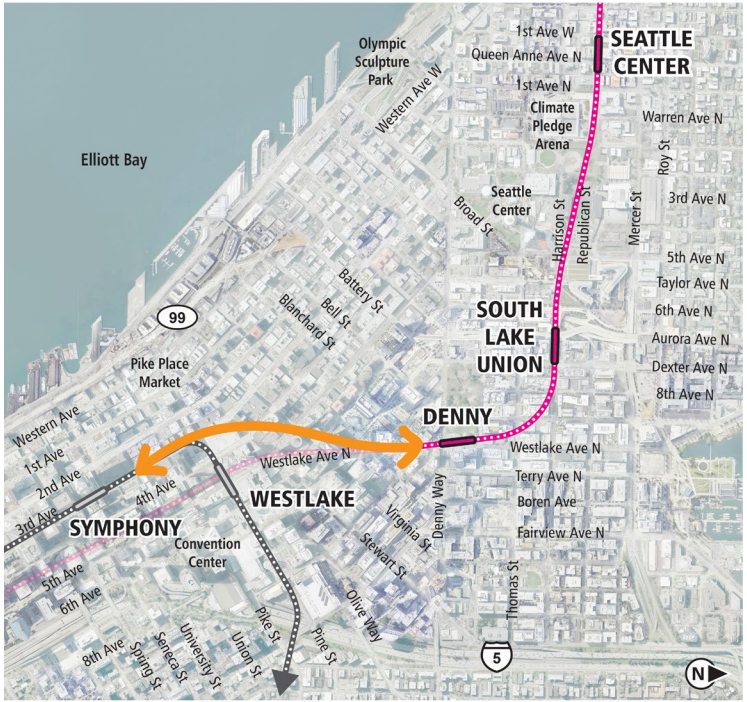
Interline



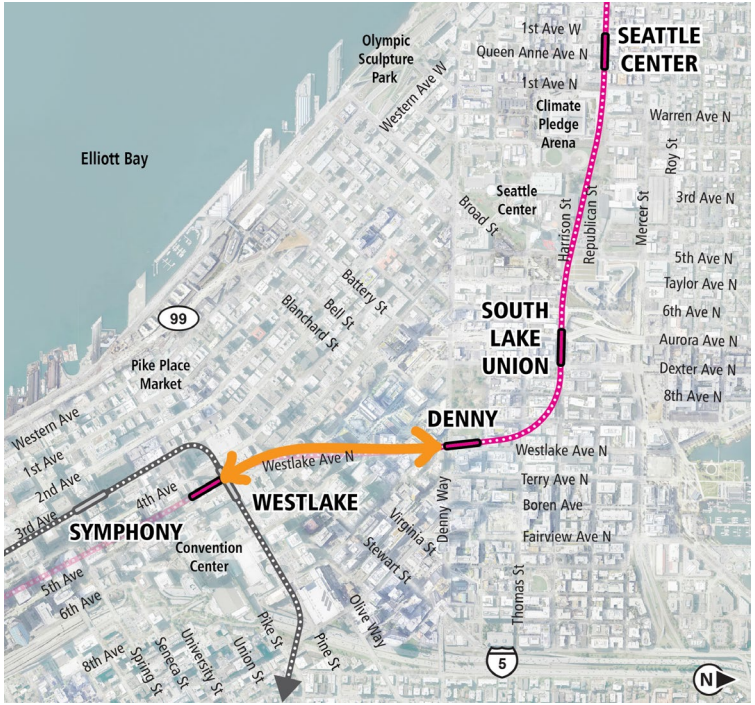
Stub-end

Ballard Link Preferred Alternative
Existing DSTT
Study Concept

What concepts did we look at?



Interline

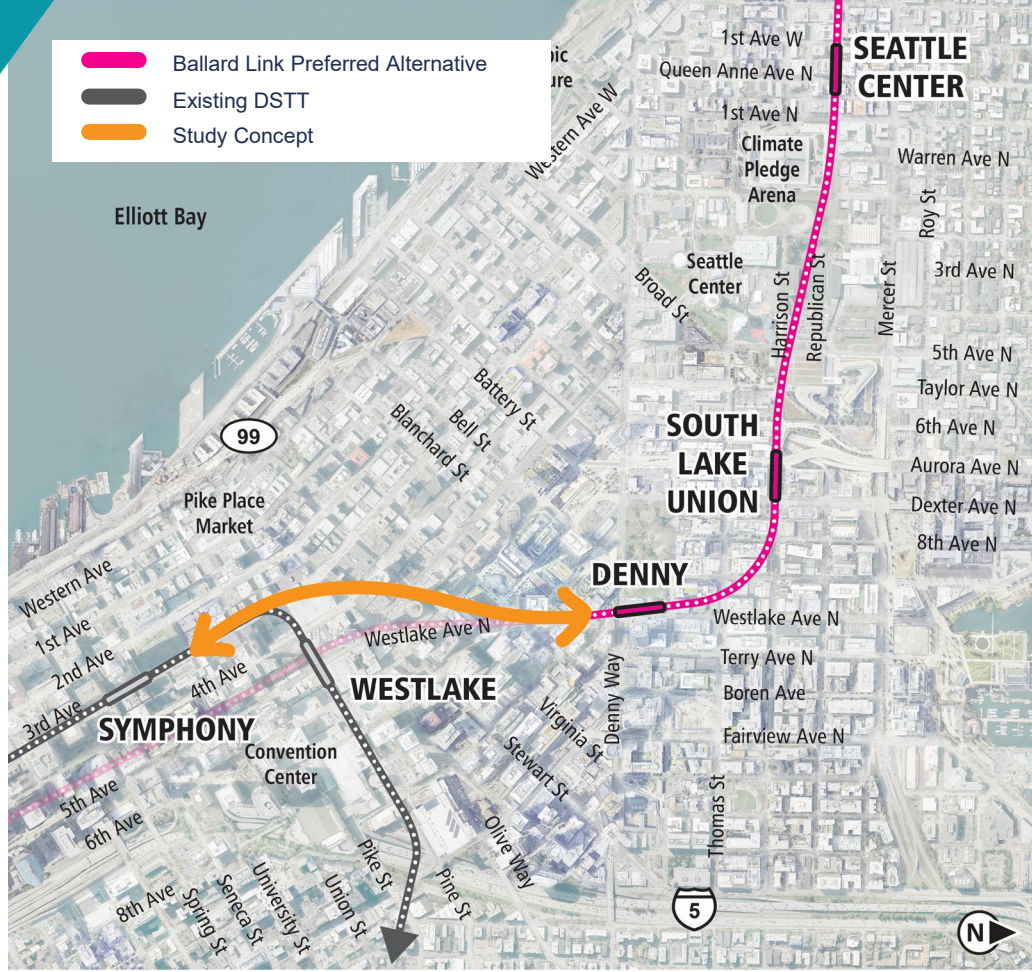


Stub-end

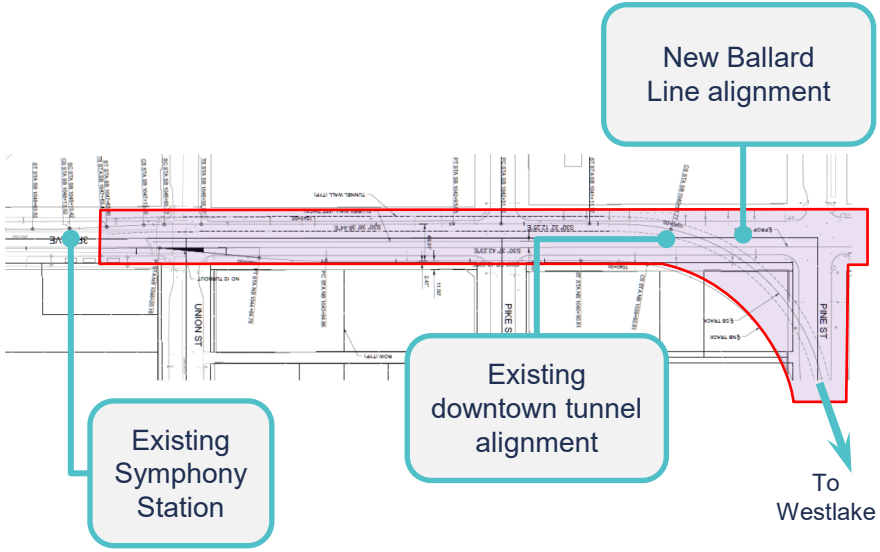
What concepts did we look at?

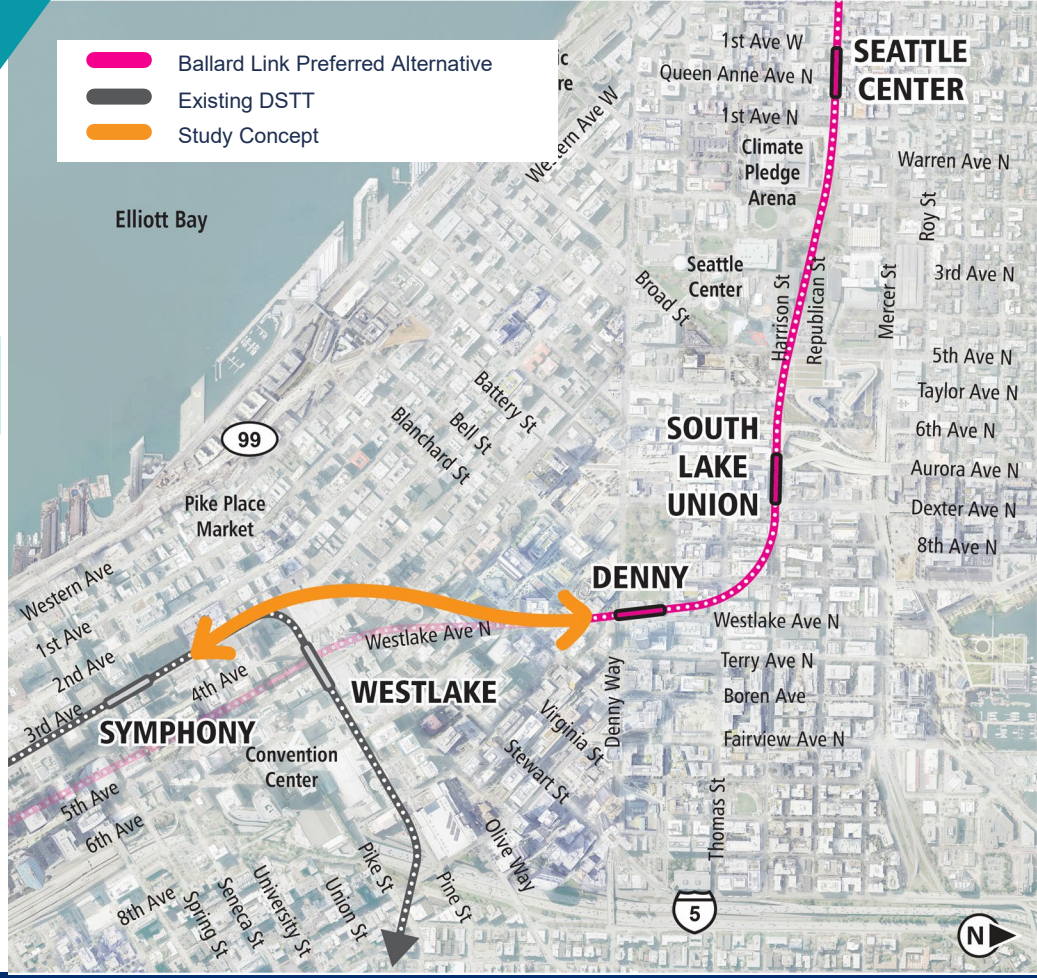
Interline concept

- Interlines Ballard line into existing downtown tunnel between Symphony and Westlake stations under 3rd Ave
- Transfers from Ballard line to rest of system would occur at Symphony Station or further south
- Several versions of this concept were assessed



Interline concept

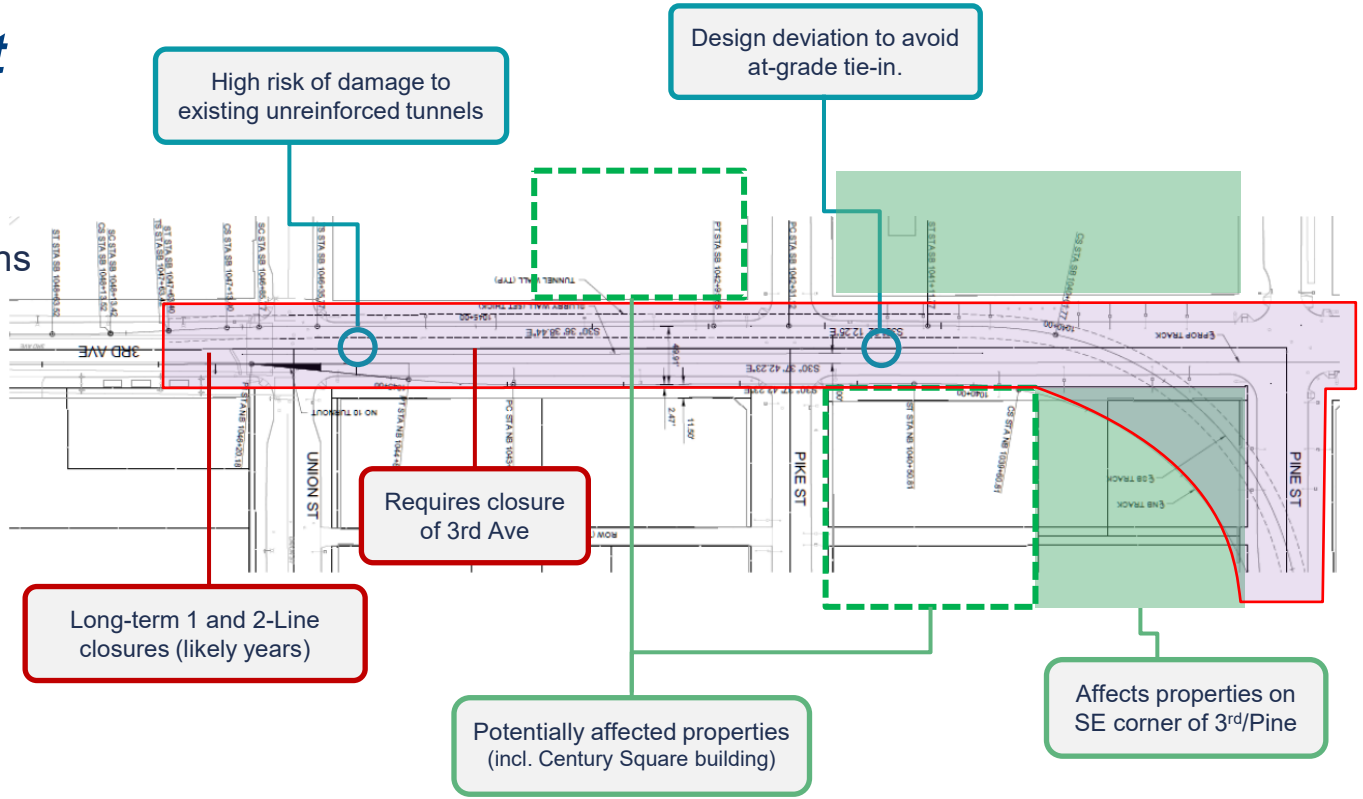




SoundTransit

Interline concept

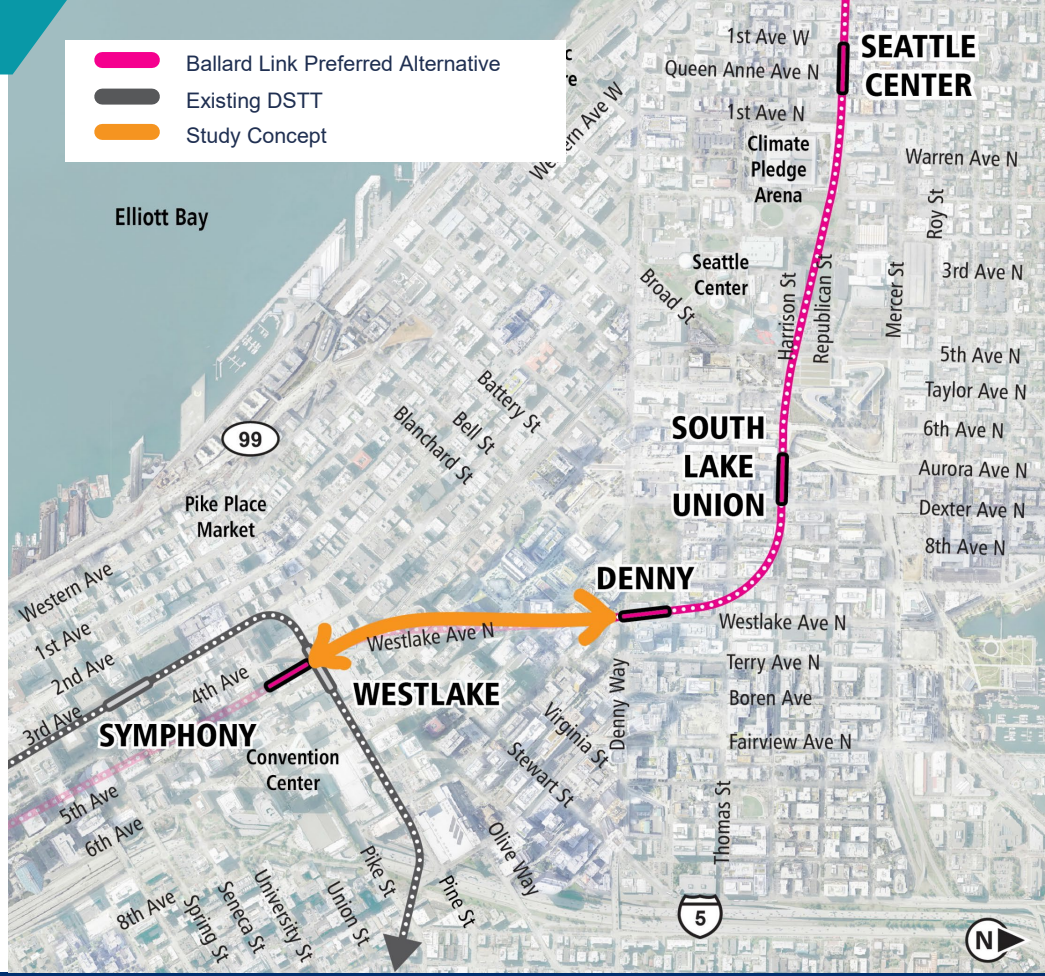
- Operational Considerations
- Property Effects Considerations
- Technical Considerations



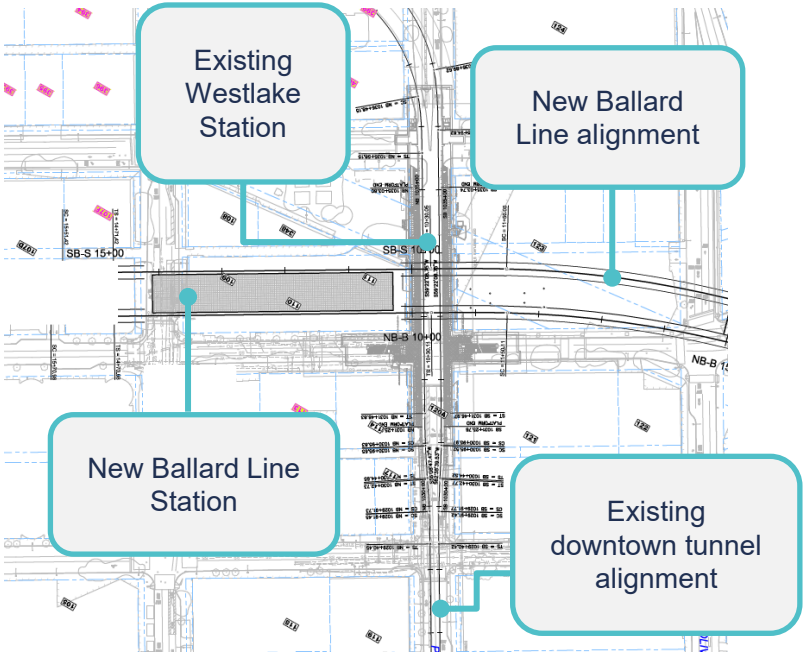
What concepts are we looking at?

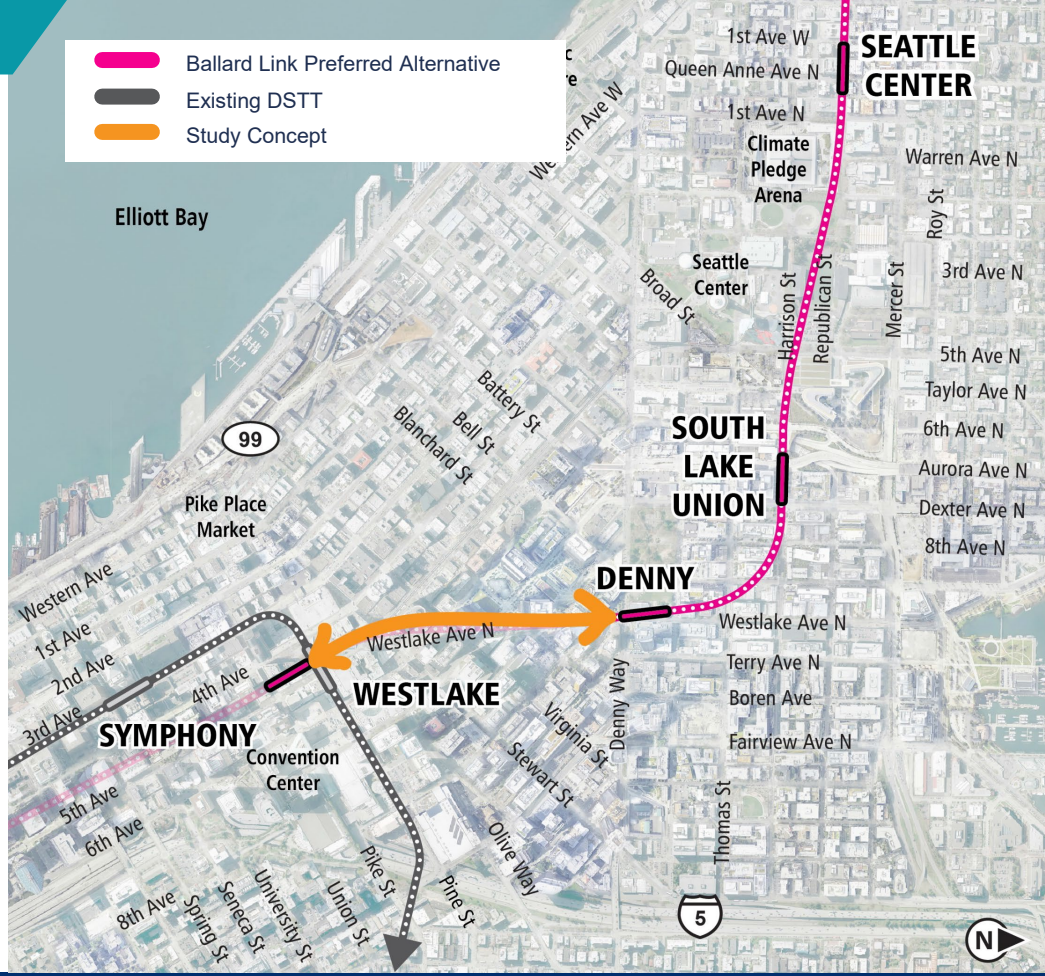
Stub-end concept

- Terminates Ballard line where it meets the existing downtown tunnel at Westlake Station
- Forced transfer from Ballard line to rest of the system at Westlake Station



Stub-end concept





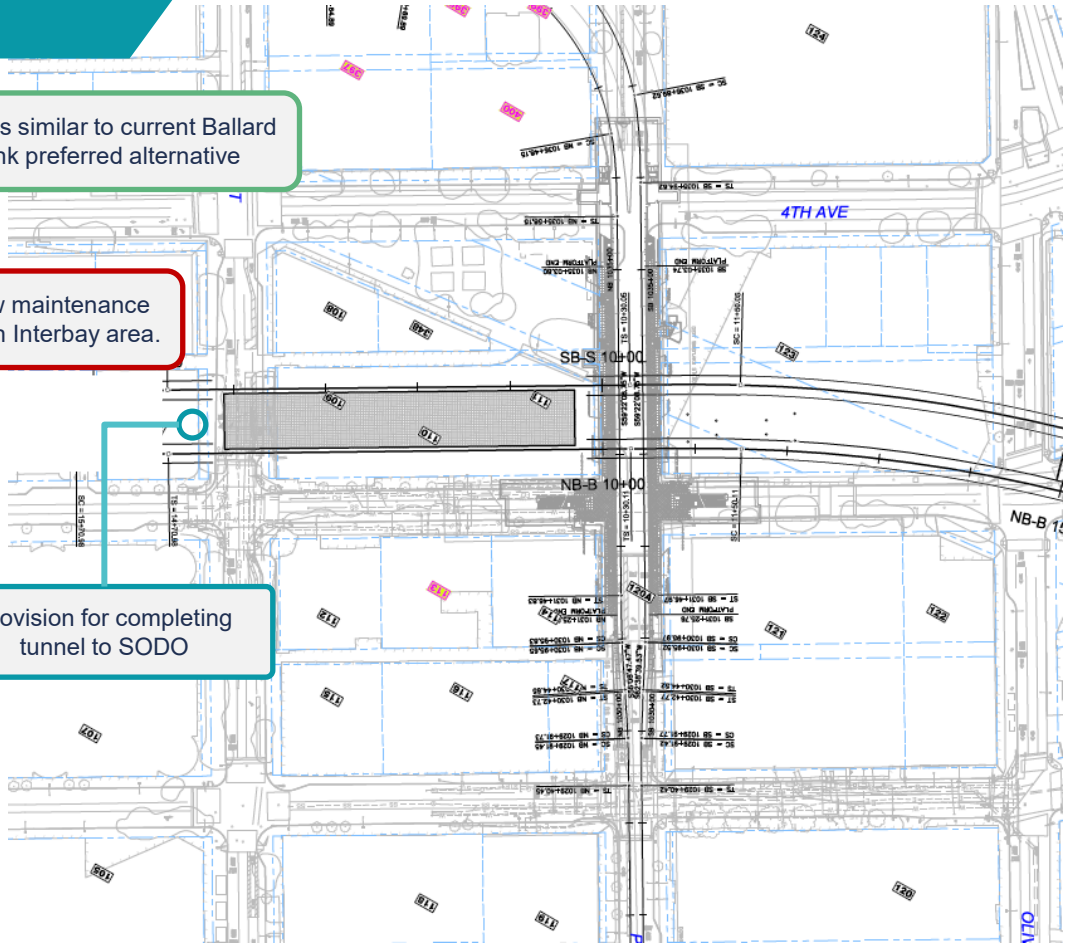
Stub-end concept

Effects similar to current Ballard Link preferred alternative

Requires new maintenance facility, likely in Interbay area.

Provision for completing tunnel to SODO

- Operational Considerations
- Property Effects Considerations
- Technical Considerations



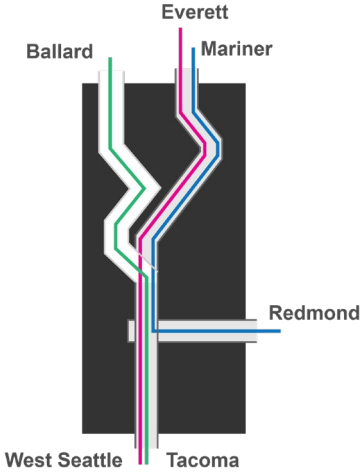
Findings

What have we learned?

Findings in the following categories:

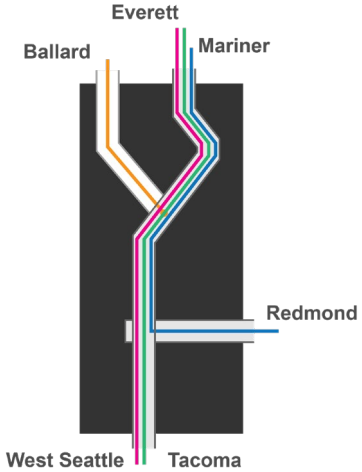
- Cost savings
- Passenger transfers
- Future tunnel completion
- Construction disruption
- Maintenance facility needs
- System reliability and resilience
- Project schedule delay

Cost savings



Interlining

- Approx $0 – 4.5 billion savings



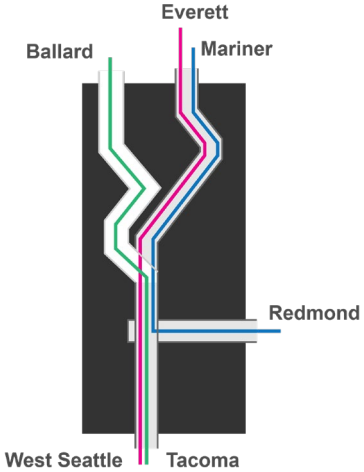
Stub-end

- Approx $0 – $4 billion savings

Key points

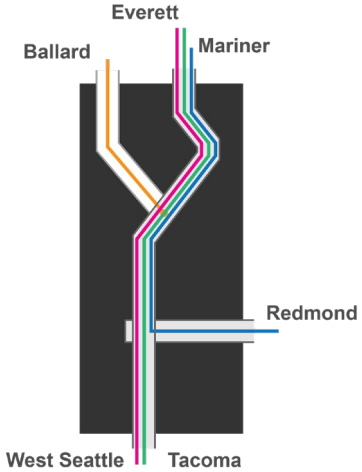
- Both concepts may save costs over full-build Ballard Link
- Savings partially offset by costs of new construction, new right of way, service disruption, system upgrades, and project delay
- Stub-end concept includes cost of additional maintenance facility
- Estimates are preliminary; costs of upgrades and other **risk factors are uncertain and could reduce or eliminate savings**

Passenger transfers



Interlining

- Same-platform transfers at IDS, Pioneer Square, and Symphony, including to Ballard



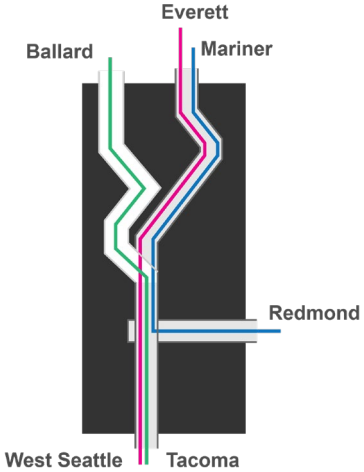
Stub-end

- Same-platform transfers at IDS, Pioneer Square and Symphony
- Transfer to/from Ballard Link at Westlake

Key points

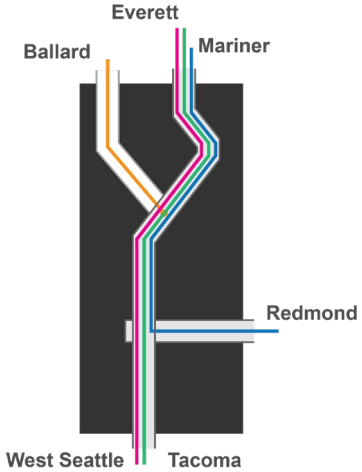
- Interlining allows same-platform transfers between 1, 2, and 3 Lines at IDS, Pioneer Square, and Symphony stations, including to Ballard
- Stub-end allows same-platform transfers between 1, 2, and 3 Lines at IDS, Pioneer Square, and Symphony stations but requires transfer to/from standalone Ballard line at Westlake

Future tunnel completion



Interlining

- Allows future extension of tunnel to SODO; some redundant infrastructure



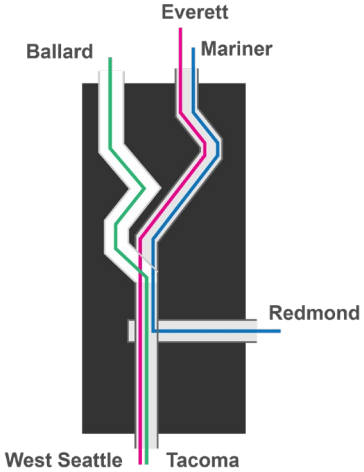
Stub-end

- Facilitates future extension to SODO

Key points

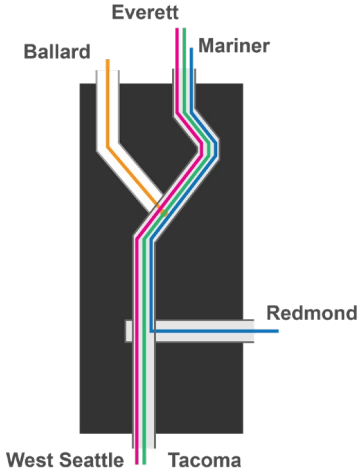
- Interlining could allow for future extension of tunnel from Westlake south to SODO but results in redundant infrastructure that could serve as train storage or connection between lines
- Stub-end facilitates future extension of tunnel from Westlake to SODO

Construction disruption and risk



Interlining

- Requires closure of existing light rail and 3rd Ave
- Risk due to soils and existing tunnel integrity



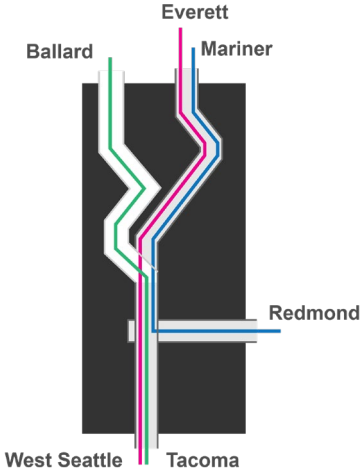
Stub-end

- Does not require closure of existing light rail

Key points

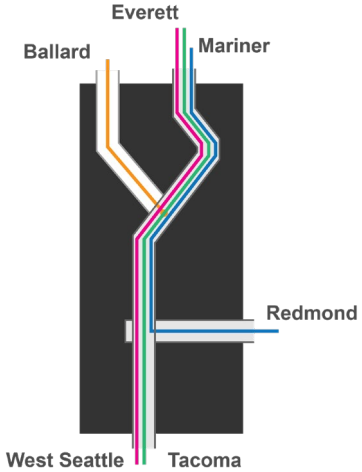
- Interlining requires existing light rail service through downtown be suspended for an extended period, potentially years, to accommodate construction
- Interlining also requires closure of 3rd Ave for an extended period (potentially up to one year or more) with effects to bus routes using that corridor
- Interlining presents cost and schedule risk due to soils and existing tunnel integrity
- Both concepts require beginning tunneling activities in Seattle Center area rather than SODO

Maintenance facility needs



Interlining

- Does not require new maintenance facility



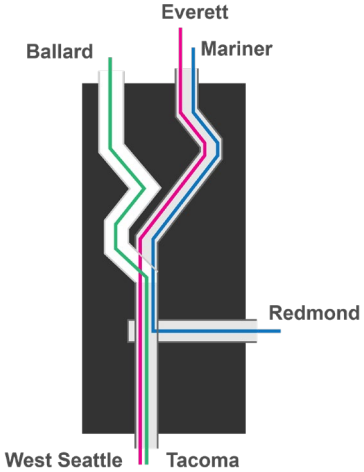
Stub-end

- Requires new maintenance facility

Key points

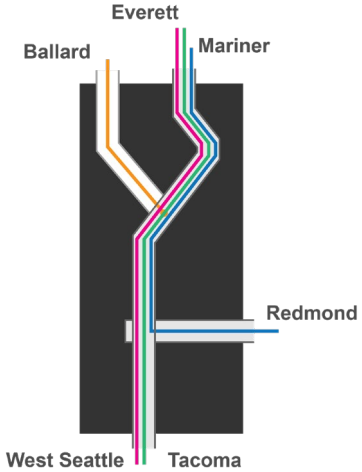
- Stub-end approach ***requires*** construction of new maintenance facility along Ballard line, likely in Interbay area
- New maintenance facility would require additional environmental review with substantial permitting and property acquisition risk
- If property acquisition unsuccessful, or other construction issues arise, then service could not operate on the Ballard line
- Ongoing operations and maintenance cost for a new maintenance facility

System reliability and resilience



Interlining

- Requires upgrades to existing DSTT



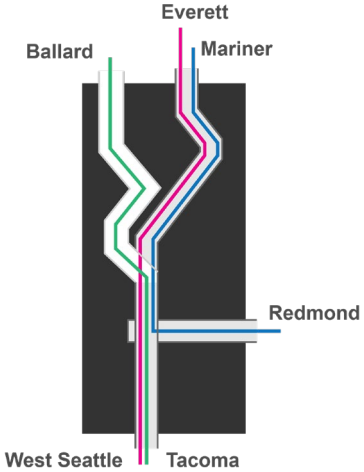
Stub-end

- Requires upgrades to existing DSTT

Key points

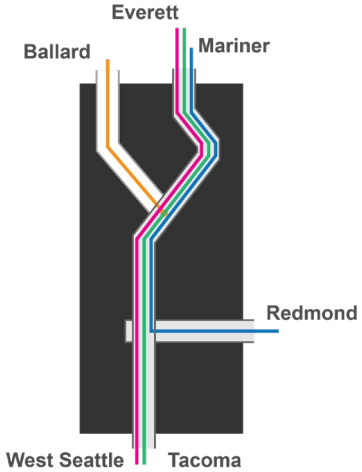
- Both interlining and stub-end approaches require extensive near-term infrastructure upgrades to existing DSTT
- Substantial upgrades required to accommodate running multiple lines through existing DSTT
- Even with upgrades, headway/system reliability concerns remain; journey times highly susceptible to routine disruptions
- Despite upgrades, increased risk of single tunnel as critical point of failure – any disruption could halt entire system

Project schedule delay



Interlining

- Delays schedule by at least two years



Stub-end

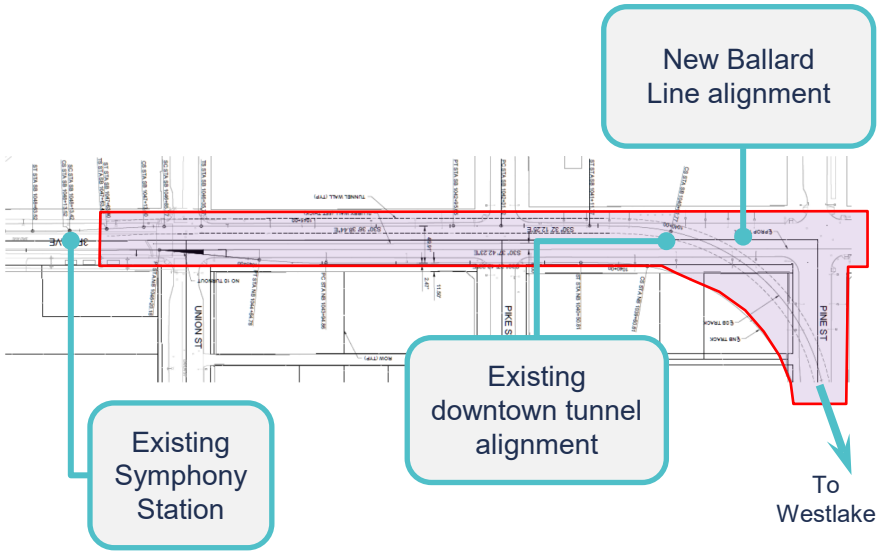
- Delays schedule by at least two years

Key points

- Additional environmental review and design effort would likely delay overall schedule by at least two years
- Risk of delay greater than two years due to uncertainties in environmental process
- Overall construction schedule would be similar, or slightly longer, due to need to begin tunneling at Seattle Center rather than SODO

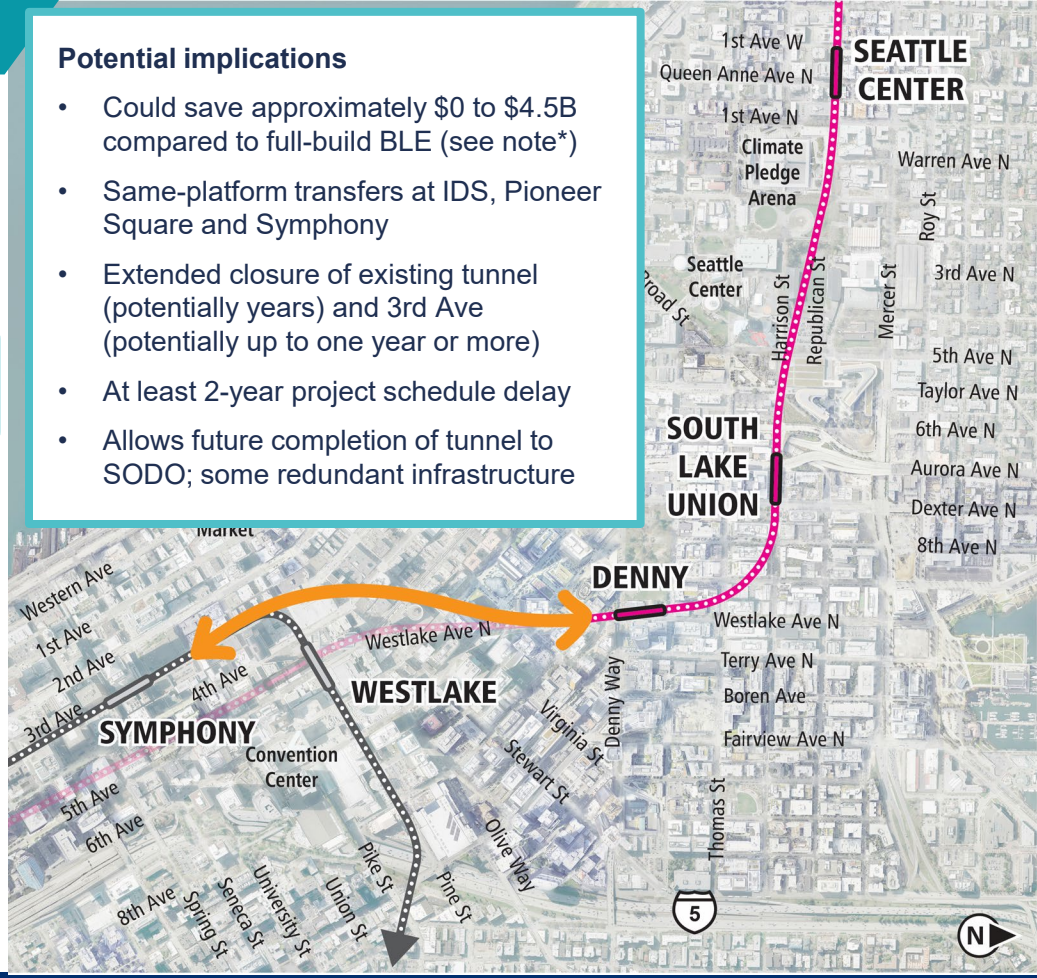
Conclusions

Interline concept



Potential implications

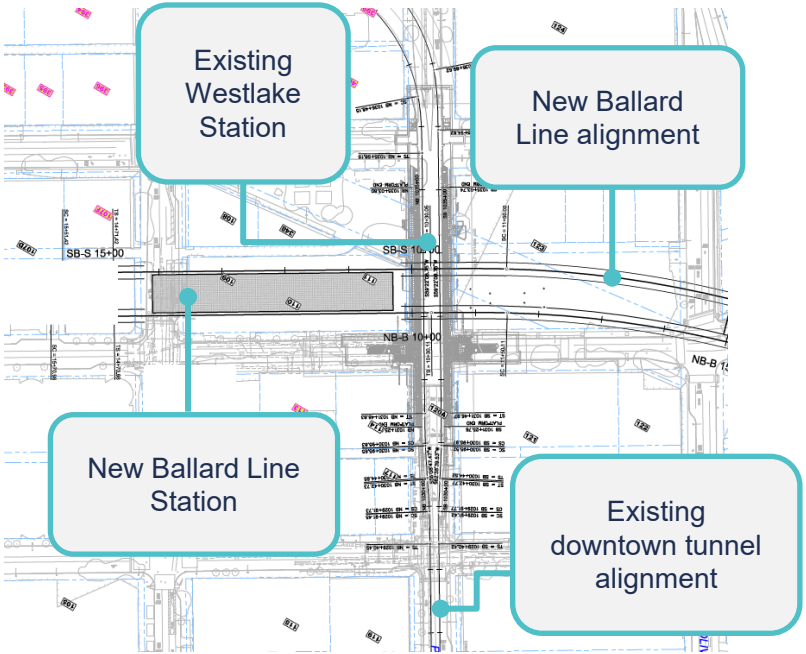
- Could save approximately $0 to $4.5B compared to full-build BLE (see note*)
- Same-platform transfers at IDS, Pioneer Square and Symphony
- Extended closure of existing tunnel (potentially years) and 3rd Ave (potentially up to one year or more)
- At least 2-year project schedule delay
- Allows future completion of tunnel to SODO; some redundant infrastructure



What have we learned?

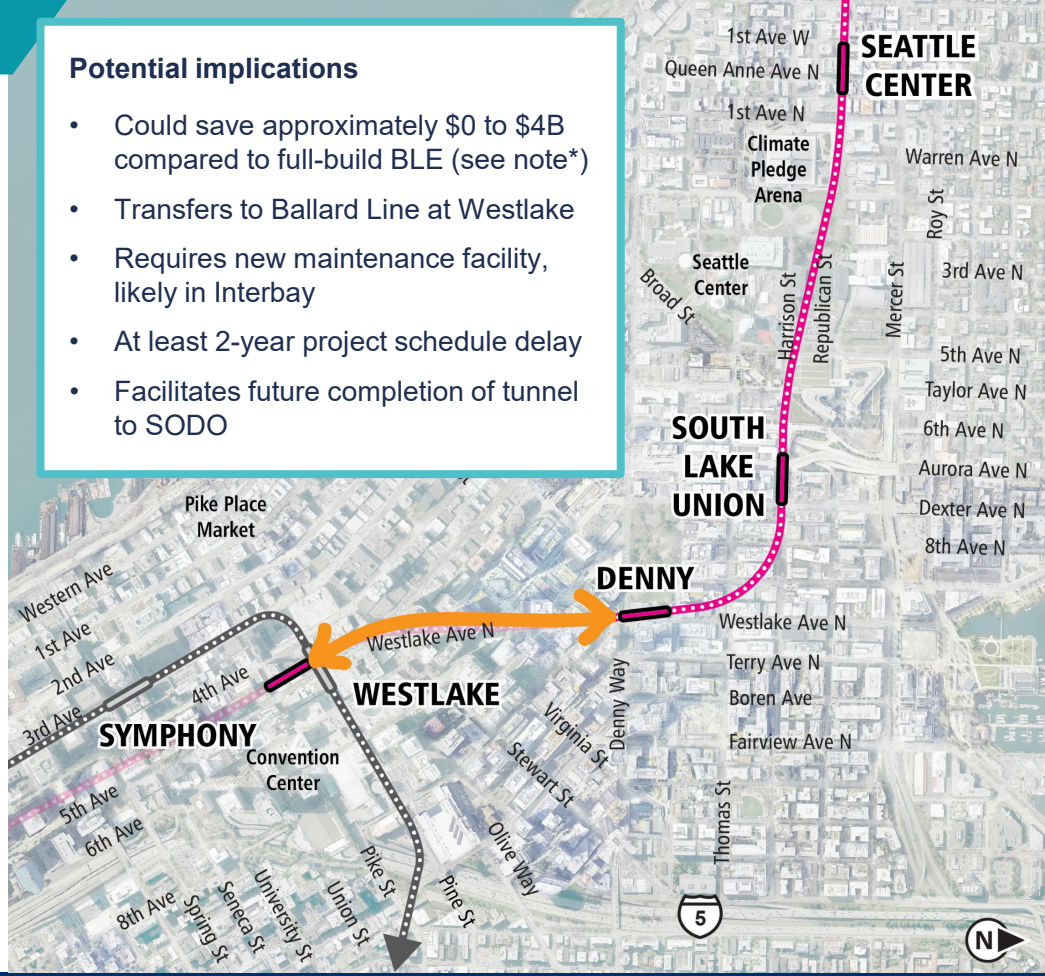
* Estimate is very preliminary; costs associated with required major upgrades to existing tunnel and other risk factors and unknowns could significantly reduce these potential savings

Stub-end concept



Potential implications

- Could save approximately $0 to $4B compared to full-build BLE (see note*)
- Transfers to Ballard Line at Westlake
- Requires new maintenance facility, likely in Interbay
- At least 2-year project schedule delay
- Facilitates future completion of tunnel to SODO



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Thank you.

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