Capital Cost Estimate Update for Projects in Development

System Expansion Committee

01/14/2021

SOUNDTRANSIT

Why we're here

Provide more detail on the following capital cost estimates for ST3 projects currently in the project development phase:

- West Seattle & Ballard Link Extensions
- Tacoma Dome Link Extension

Discuss next steps

Discussion only, informing future Board actions.

Current construction not affected

- This latest review applies only to cost estimates for projects not yet baselined.
- 7 of 8 projects currently under construction are below budget and on schedule.
- By 2024 we remain on track to nearly triple the region's light rail system from 22 to 62 miles.
- Similar cost pressures increased baseline budgets for the Lynnwood and Federal Way extensions prior to beginning construction.

ST3 Plan cost estimates

Previous methodology reviews

State-appointed Expert Review Panel, September 26, 2016:

"The level of allowances, contingencies and reserves at this very early stage of planning and design is appropriate. Further, the capital cost estimating methodology is sound and consistent with good industry practice."

"It is important to recognize that at this stage of project planning (and when the projects go to the ballot) the necessary environmental work has not begun for most of the projects... This makes cost estimating with any precision difficult."

Process of refining estimates

ST3 Plan estimates were conceptual in nature and based on very limited design. The plan identified risks for cost to grow beyond initial estimates.

"Cost risk: The projects in Sound Transit 3 are based on conceptual engineering estimates. The risks for costs to grow beyond initial estimates include: faster than anticipated growth in construction costs; faster than anticipated growth in real estate values; the addition of new required elements or projects not currently included in the plan and more expensive project elements.

The Sound Transit Board will closely monitor and manage project scope and cost risks to minimize cost increases. In addition, the Sound Transit 3 Plan includes contingencies within the project budgets that allow for uncertainties and unforeseen conditions that arise during the design and construction of the projects."

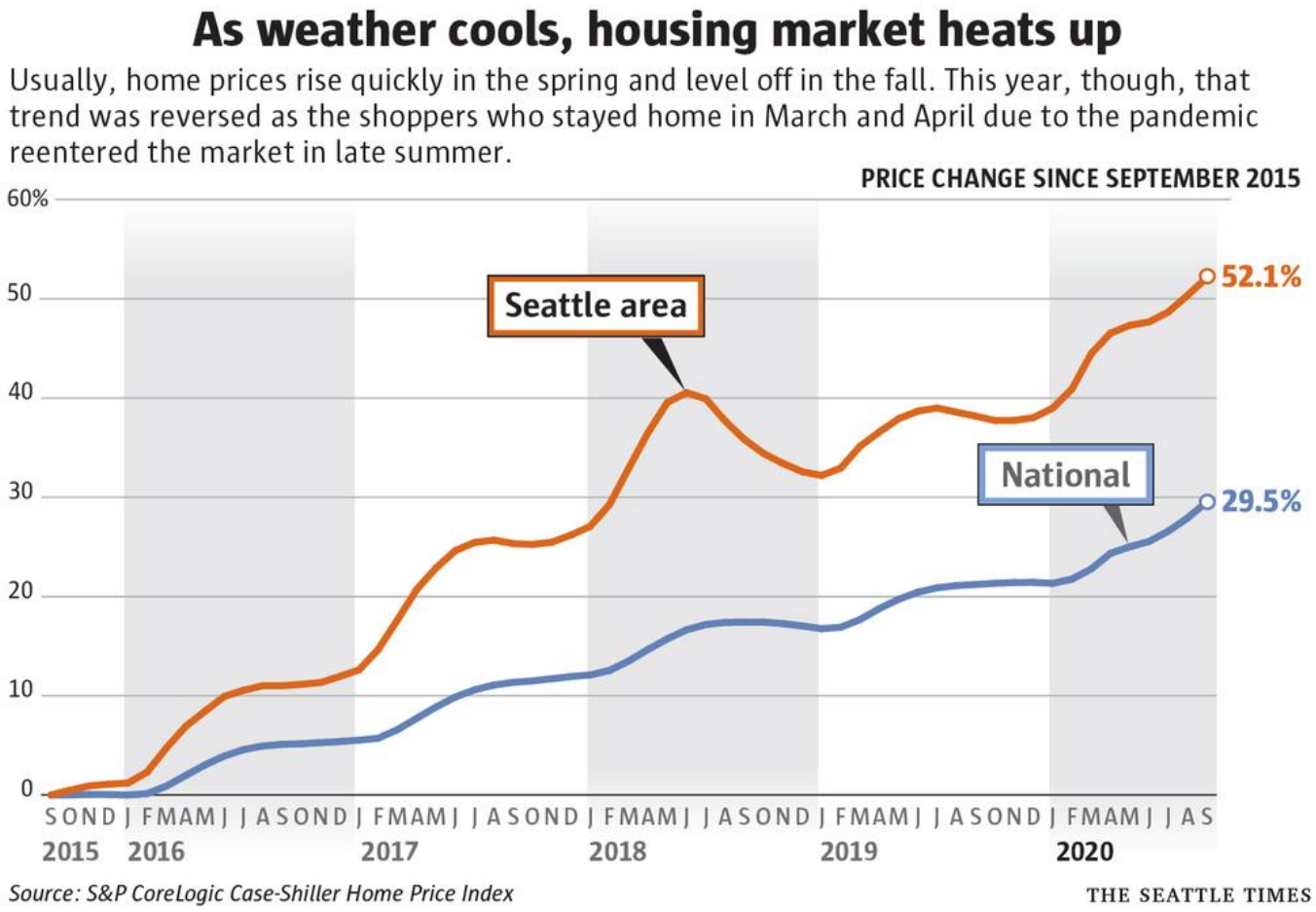
Process of refining estimates

Continued

- ST3 project estimates were developed in 2015, refined in 2016 and updated in 2019 and 2020.
- Inevitable early design uncertainty requires significant contingencies (70% or more in ST3).
- Current estimates reflect approximately 10% design for light rail projects.
- The Board formally baselines project costs and schedules, usually at 30-60% design.
- Contingencies are reduced as designs advance and are typically in the 15-20% range entering construction.

Real estate cost pressures

Growth in property values and the pace of development are continuing well beyond expectations, despite the pandemic recession.



Construction cost pressures

Construction market showing continued pressures as reviewed by the Associated General Contractors of America with the Board in 2019:

- Costs of construction materials.
- Labor shortages.
- Increased construction bid prices or lengthening completion times.

Project cost pressures

Continued

- Better understanding of site conditions gained only through project development may yield scope requirements greater than anticipated in planning allowances
- As design and engagement advances, project scopes tend to increase and need to be managed.
- Some scope changes are due to unforeseen jurisdictional or regulatory requirements.
- Other scope changes are from lessons learned, such as need for redundant stairs and multiple station access points.

Project cost pressures

Contingencies & soft costs

- Contingencies added based upon a fixed percentage of overall estimated costs.
- Contingency percentages, are derived from standard industry metrics and the detail level of the estimate.
- Soft cost percentages for ST3 estimates derived from 15 years of agency project experience and historical data.

Cost estimate increase categories

Summary for light rail projects with updated estimates

	Change from 2019-2020	% Increase of total*
Right-of-way	$2.09-$2.47 billion	40%-43%
Design advancement & additions	$1.7-$2.28 billion	35%-37%
Contingencies & soft costs	$1.05-$1.42 billion	22%-23%
Total	**$4.84-$6.17 billion**	**42%-50%**

Rounded to nearest tens of millions, 2019$

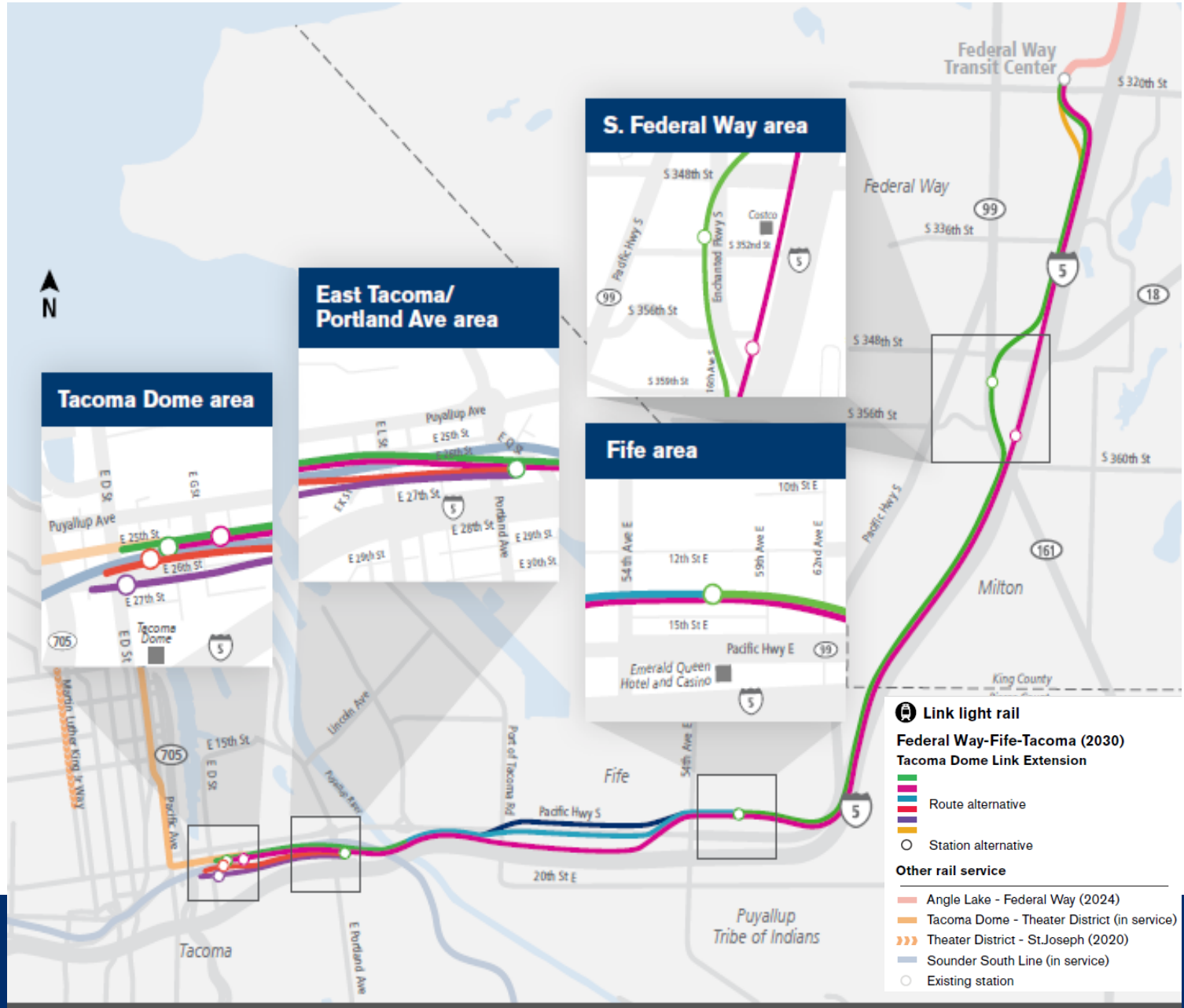
Tacoma Dome Link Extension

Tacoma Dome Link Extension (TDLE)

- 10 miles
- 4 stations
- 1 river crossing

Preferred Alternative (PA):

- Alignment west of I-5 (no alignment PA in Fife)
- Stations: Enchanted Pkwy, Fife, Portland Ave. and Tacoma 25th West



TDLE: Cost Comparison by Alternative

In millions, 2019$

	2019	2020	$ increase	% increase
PA – using I-5 alignment option through Fife	$2,845	$3,298	$453	16%
PA – using SR 99 alignment option through Fife	$2,999	$3,308	$309	10%

PA: Preferred Alternative

Tacoma Dome Link Extension Summary

In millions, 2019$	2019	2020	Chg vs. 2019
Cost estimate:	$2,845 - 2,999	$3,298 - 3,308	10% - 16%

What has changed since 2019?

- **Construction** costs driven by changes in guideway design, pedestrian circulation at stations, adding drainage vaults for stormwater retention
  - Preferred Alternative using I-5: +$310M
  - Using SR 99: +$220M
- Corresponding increases to **soft costs** and **contingencies**
  - Preferred Alternative using I-5: +$141M
  - Using SR 99: +$100M

Primary areas of cost increases since 2019

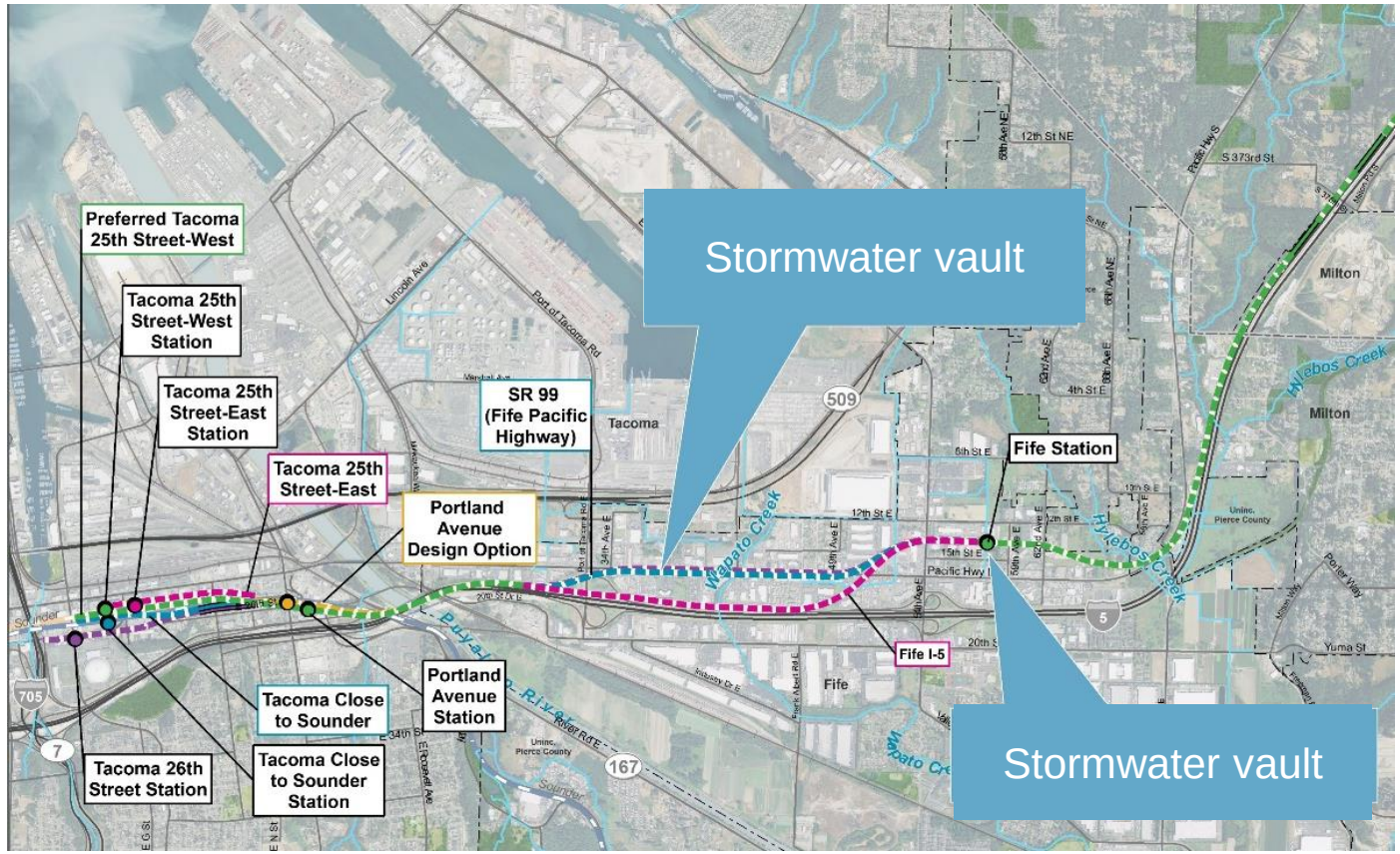
- Stormwater drainage facilities. (+$103M)
- Station passenger circulation improvements. (+$88M)
- Guideway profile: Surface to elevated. (+$76M)
- Elevated guideway structures. (+$28M)

Stormwater Drainage Facilities

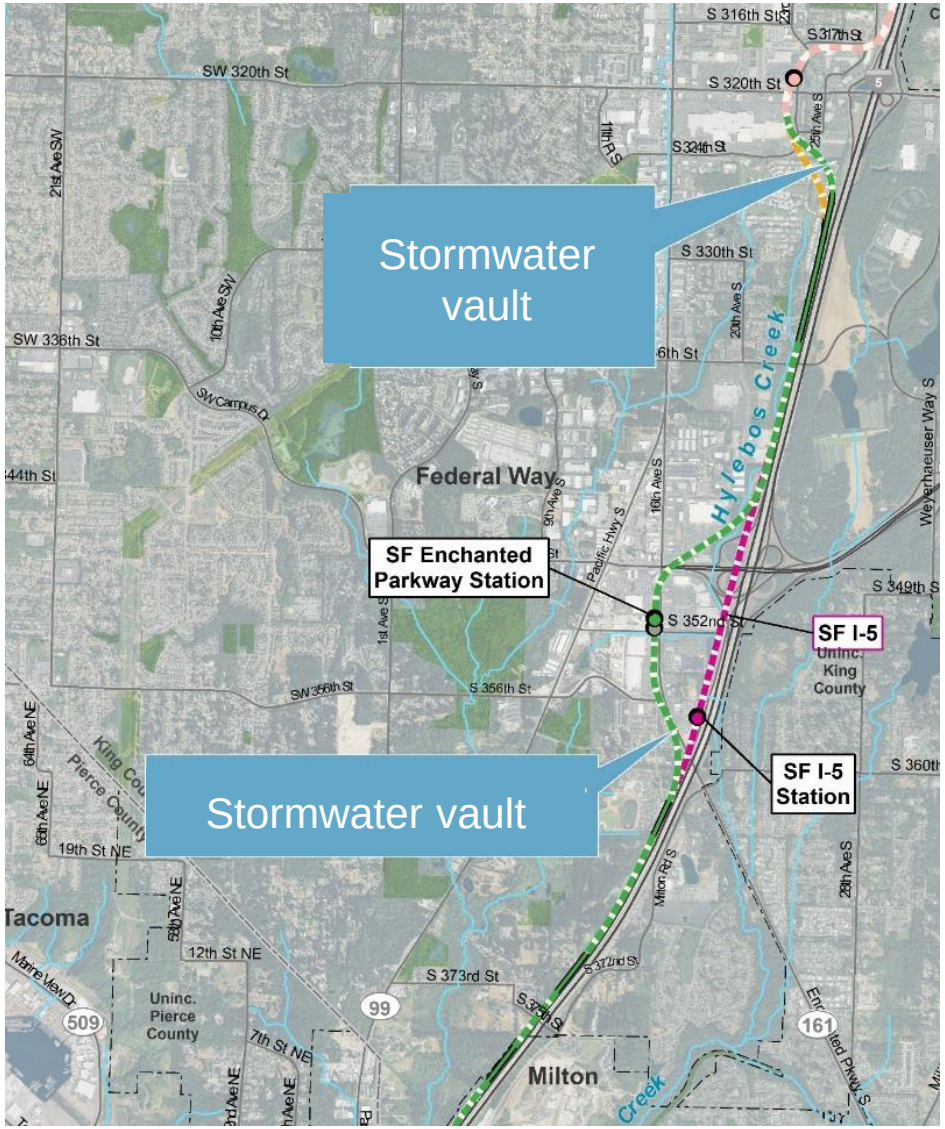
Increase driven by

- Drainage costs refined from a general utility allowance to site-specific design.
- Drainage vaults minimize footprint and impacts to urban areas. +**$103M**

Stormwater Drainage Facilities



Fife and Tacoma Segment



South Federal Way Segment

SOUNDTRANSIT

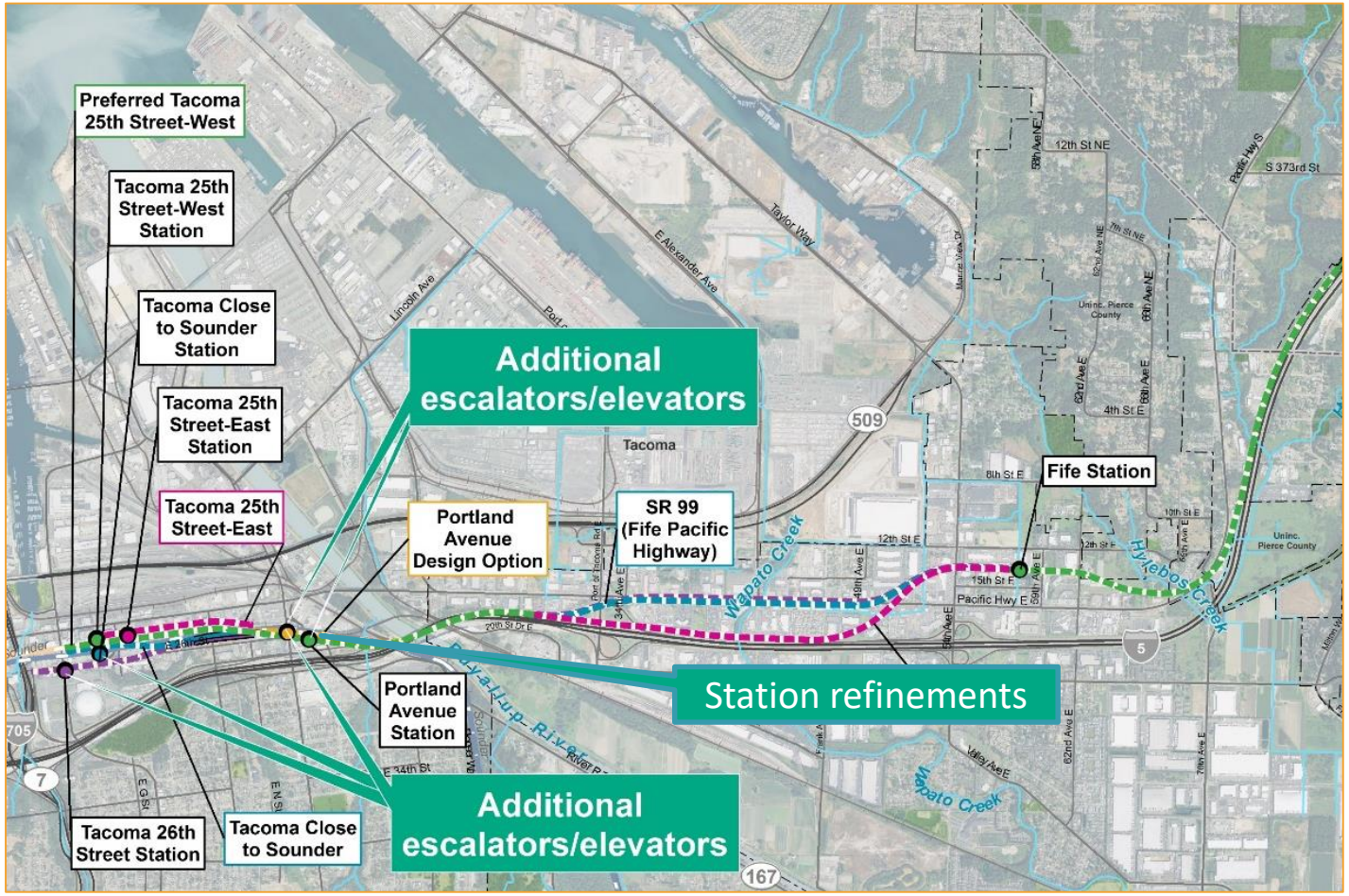
Station passenger circulation improvements

Increase driven by

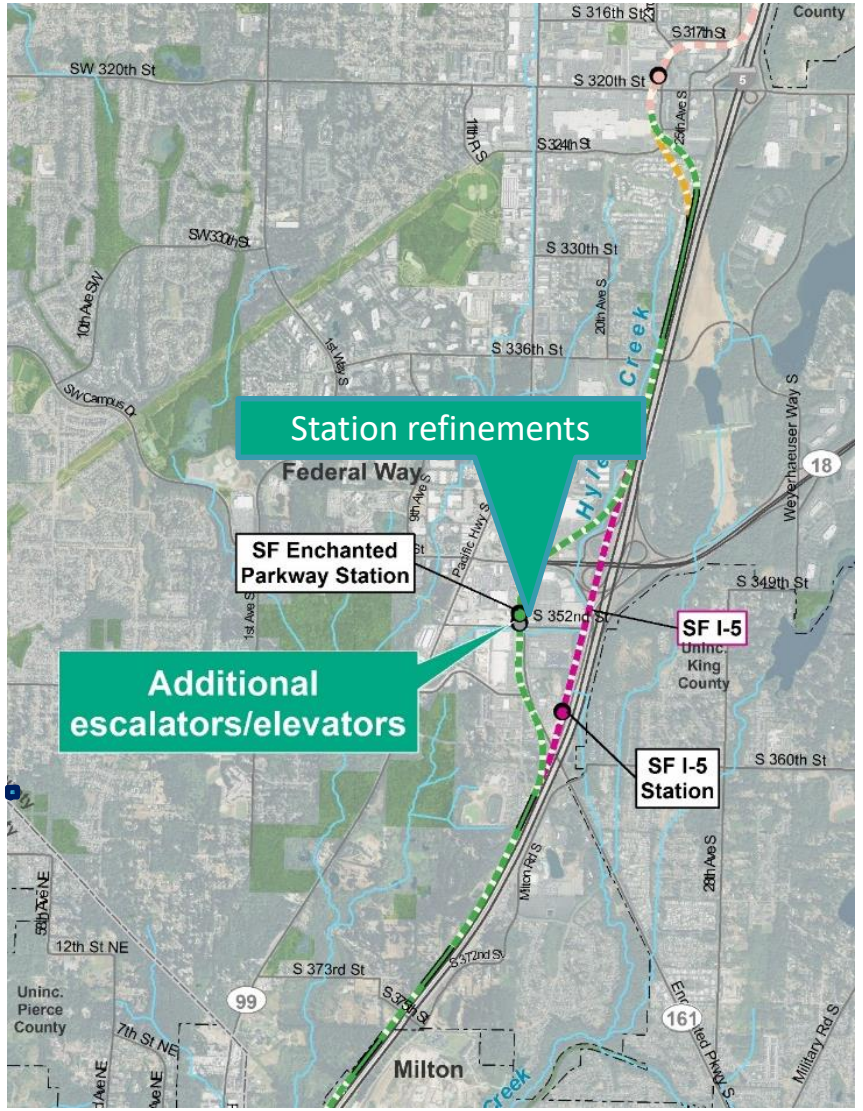
- Changed to side-platform design at Portland Ave. Station and added mezzanine due to design requirements and refinements to bridge crossing location.
- Increased height and added mezzanine at Enchanted Parkway Station to accommodate operational flexibility.
- Added escalators (22) and elevators (5) to meet ST requirements.

Total increase **+$88M**

Station improvements



Fife and Tacoma Segment



South Federal Way Segment

SOUNDTRANSIT

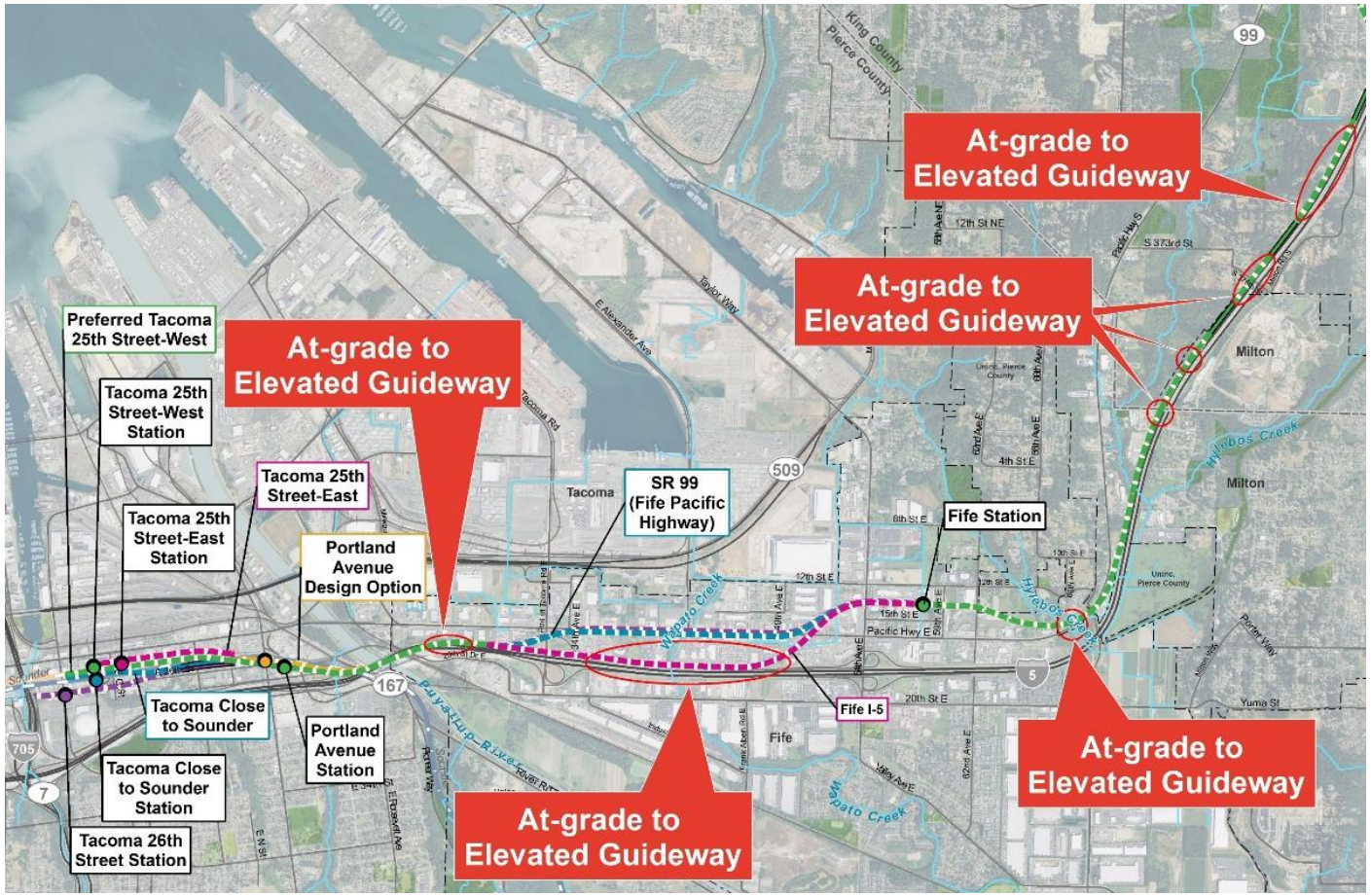
Guideway profile

Increase driven by

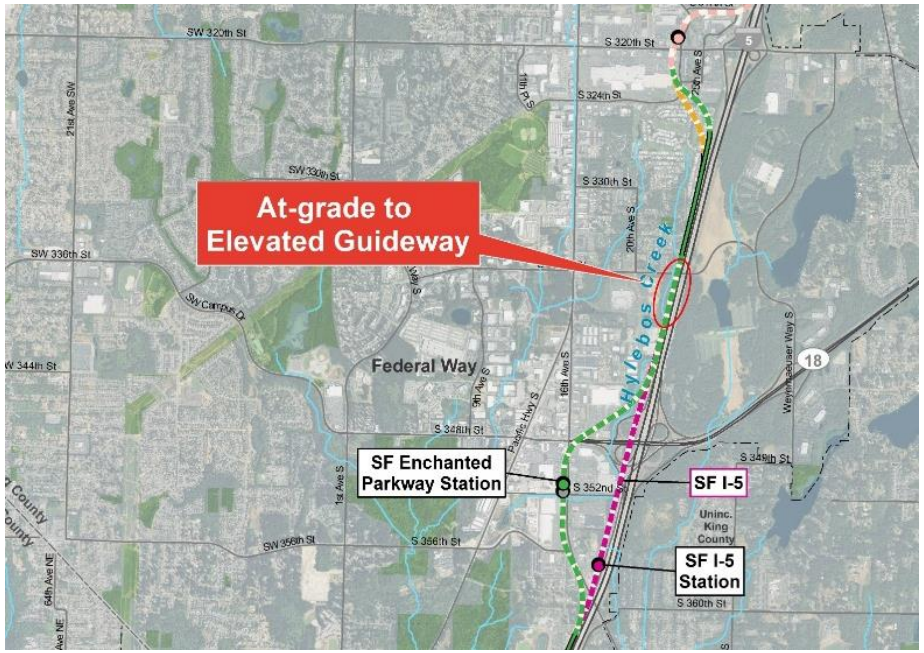
Approximately three miles of guideway changed from surface to elevated. ***+ $76M***

- Avoids conflicts with existing transportation infrastructure.
- Responds to business concerns about visual impacts from I-5.
- Minimizes potential for impacts to tribal / cultural and environmental resources (Hylebos Creek/Wapato Creek).

Guideway profile



Fife and Tacoma Segment



South Federal Way Segment

SOUNDTRANSIT

Elevated guideway structures

Increase driven by

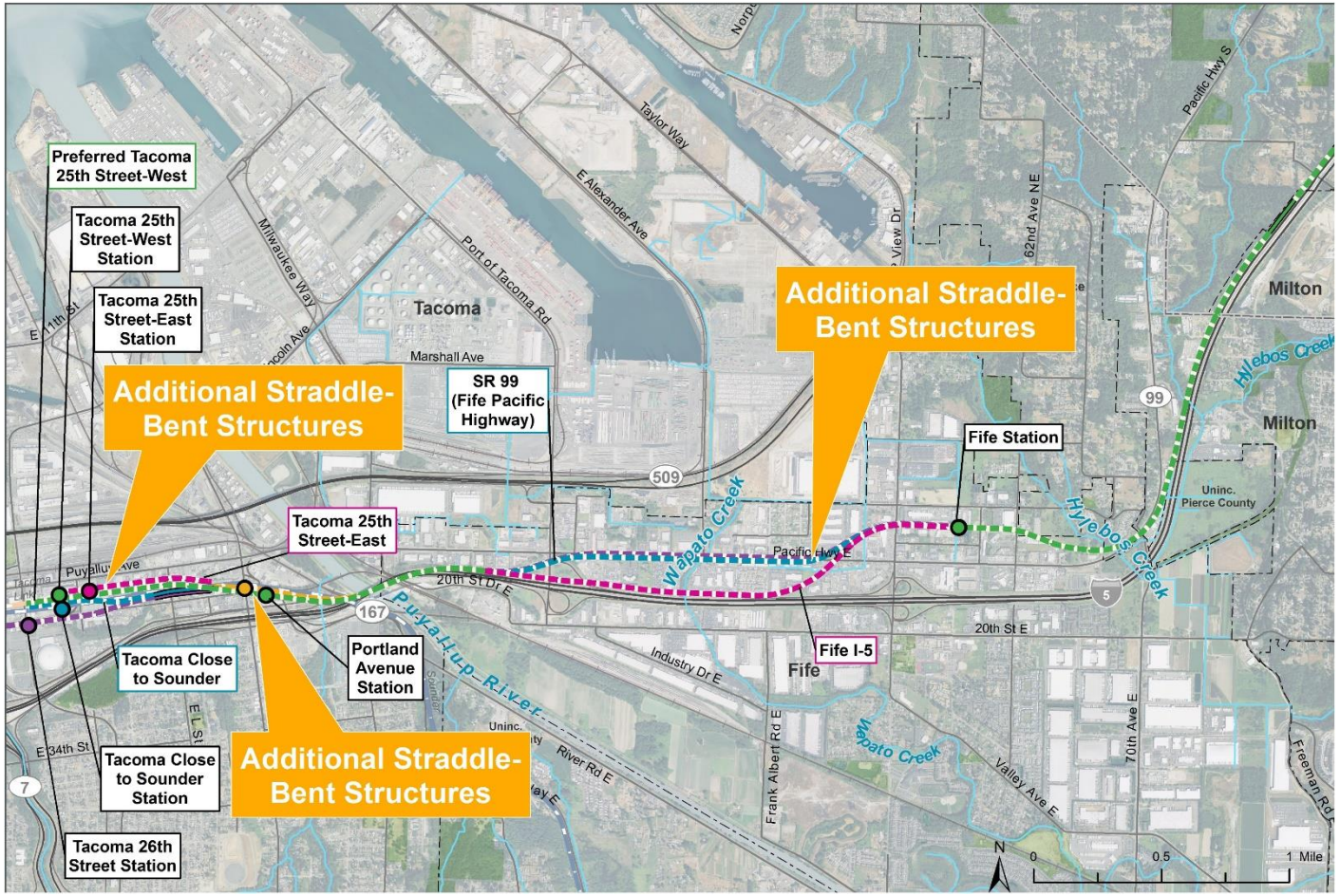
- Added straddle bents and long-span structures to avoid conflicts. ***+ $79M***
- Cost savings from changing aerial guideway structure from box girder to I-girder (~5 miles). ***- $144M***

Total increase **+$28M**

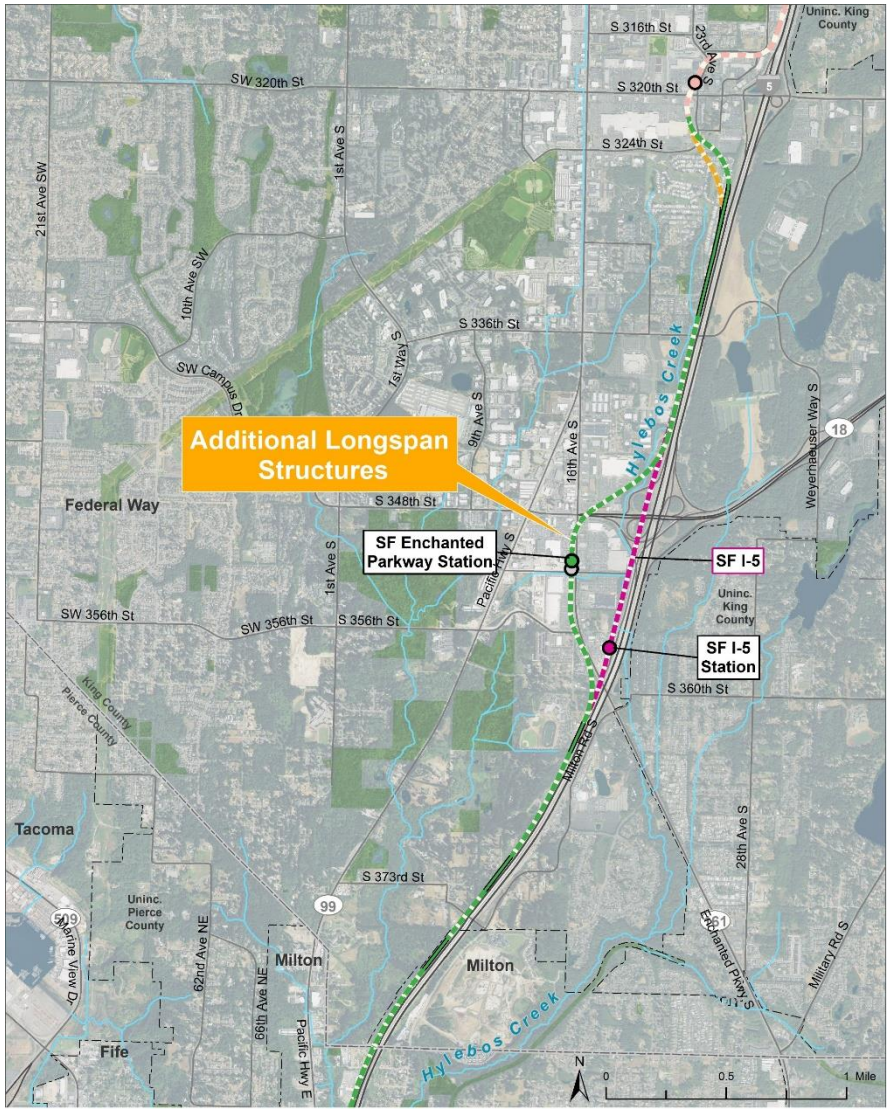
Elevated guideway structures

Straddle bents

Elevated Guideway Structures



Fife and Tacoma Segment



South Federal Way Segment

SOUNDTRANSIT

West Seattle and Ballard Link Extensions

Draft EIS alternatives

What we're studying in this phase

- Preferred Alternatives
- Preferred Alternatives with Third-Party Funding
- Other Draft EIS alternatives

*Project delivery dates currently under review due to the COVID-19 recession.

SoundTransit

Draft EIS alternatives

What we're studying in this phase

- Preferred Alternatives
- Preferred Alternatives with Third-Party Funding
- Other Draft EIS alternatives

*Project delivery dates currently under review due to the COVID-19 recession.

SOUNDTRANSIT

Change in cost estimates

In millions, 2019$

	2019	2020	Cost difference	% difference
Preferred Alternative (assumes elevated Fauntleroy Way station in West Seattle)	$7,929	$12,103	**+$4,174**	+53%
West Seattle to Downtown	$1,836	$3,174	**+$1,338**	+73%
Ballard to Downtown (includes north portal to Denny)	$3,498	$5,361	**+$1,863**	+53%
Downtown Light Rail Tunnel (IDS to Denny only)	$2,594	$3,568	**+$974**	+38%

Where a preferred alternative was not identified within a segment, the alternative most like the ST3 representative project was used

Change in cost estimates

In millions, 2019$

	2019	2020	Chg vs. 2019
Cost estimate:	$7,929	$12,103-12,581	53-59%

What has changed?

$2.13 billion for **right-of-way** acquisition, including acquiring newer commercial or multi-family developments.

$1.27 billion for **construction**, including larger aerial guideways, higher mined station costs, and improved understanding of utilities and environmental work.

$775 million in corresponding increases to **soft costs** and **contingencies**.

Change in cost estimates

Right-of-way

Change in ROW cost estimates

+$2.13 billion (+263%)

What have we learned since 2019?

- New development throughout the corridor.
- Higher rate of real estate appreciation.
- ROW needs revised.

New development throughout the corridor

Example: Same parcels in 2015 and 2020

Higher rate of real estate appreciation

- Assessment values **increased by 21%** in one year (based on recent assessment of high value properties throughout the corridor).
- Previously assumed inflation factor was **6.5%.**

ROW needs revised

- **Early planning:** Applied standard "buffer" to the alignment to define the ROW needs.

	Type	Outside Buffer
Guideway	Surface (at-grade)	60'
	Elevated 55'	55'
	Bored tunnel > 70' Deep	80'
	Bored tunnel < 70' Deep	80'
	Bored stacked	66'
	Cut-and-cover tunnel	66'
Station	Surface and Elevated	90' (580' long)
	Elevated transition	72' (500' long)
	Tunnel (cut and cover)	80' (580' long)
	Tunnel (mined)	80' (580' long)

- **Draft EIS:** Uses EIS project "footprint" to define the ROW needs.

Change in cost estimates

Construction

Change in construction cost estimates

+$1.27 billion (+26%)

What have we learned since 2019?

- **Early fieldwork/design:** Need for wider, longer spans for aerial guideway, large shafts/foundations, as well as straddle bents and tunnel related elements.
- **Advanced station planning:** Additional costs for stations and excavation support, station entrances, elevators/escalators and pedestrian walkways.
- **Early utilities investigation:** Better understanding of scope and extent of utility relocations and stormwater management.
- **Environmental study:** Better understanding of potential environmental mitigation requirements.

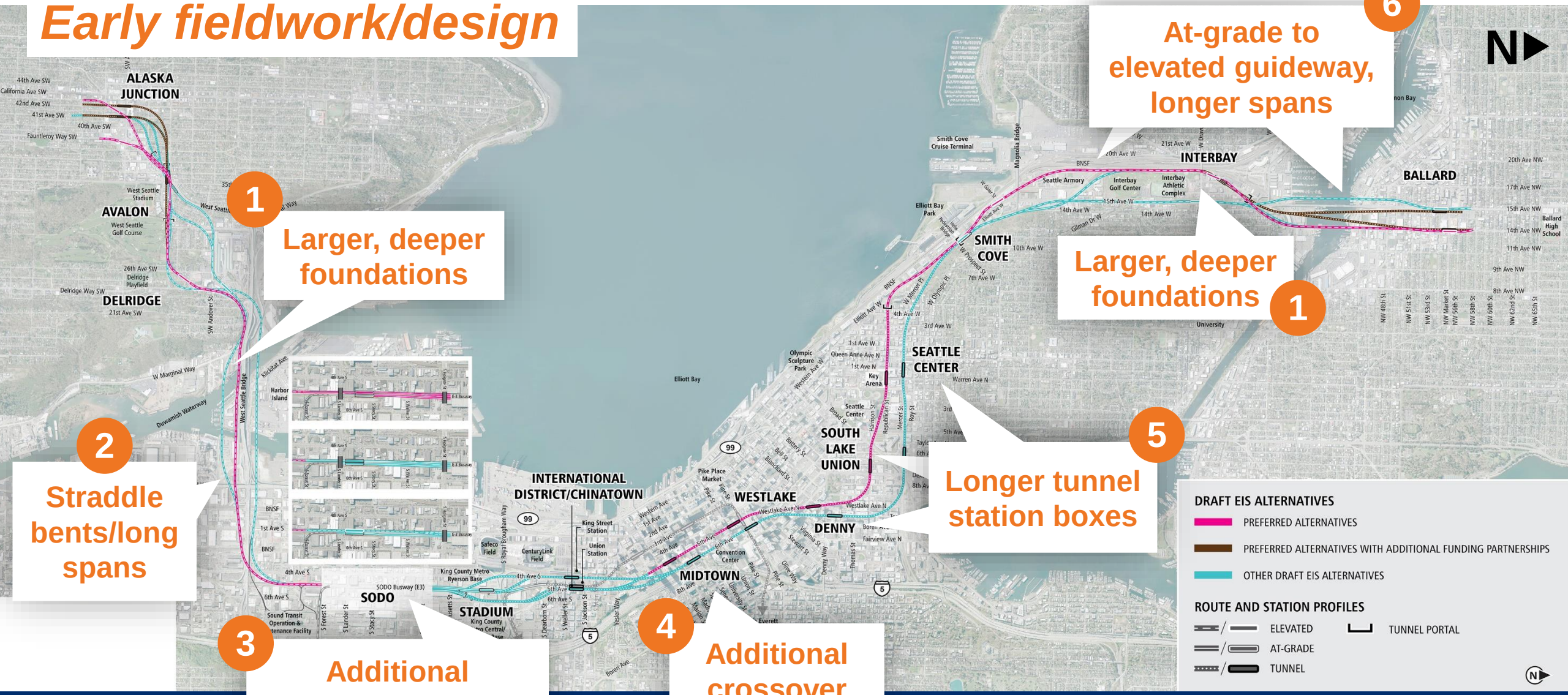
Change in construction cost estimates

Early fieldwork/design: +$480M

1. **Larger, deeper foundations** due to ground conditions in Duwamish and Interbay.
2. **Straddle bents/long spans** along Spokane St and in Duwamish and Delridge.
3. **Additional excavation support** due to ground conditions at south tunnel portal in SODO.
4. **Additional crossover** in mined cavern at Midtown.
5. **Longer tunnel station boxes** at Denny, South Lake Union and Seattle Center.
6. **At-grade to elevated guideway** from Smith Cove Station to Armory Way, **longer spans** at Salmon Bay crossing, Elliott Way crossing.

Change in construction cost estimates

Early fieldwork/design



SOUNDTRANSIT

Change in construction cost estimates

Advanced station planning: +$275M

1. **Modifications to existing station** in SODO to integrate with new station.
2. **Additional underground passages** for transfers and ventilation shafts in Downtown.
3. **At-grade to elevated** Smith Cove Station.
4. **Additional elevators/escalators** in Downtown, Smith Cove and SODO stations.

Change in construction cost estimates

Advanced station planning

Change in construction cost estimates

Early utilities investigation: +$240M

1. **Drainage detention vaults** throughout the corridor.
2. **230kV transmission line** relocation in SODO.
3. **Utility corridor** relocation in Chinatown-International District.
4. **48” deep utility** relocation along Westlake Avenue near Denny Station.
5. **96” stormwater outfall** relocation on 14th Avenue NW at Salmon Bay.

Change in construction cost estimates

Early utilities investigation

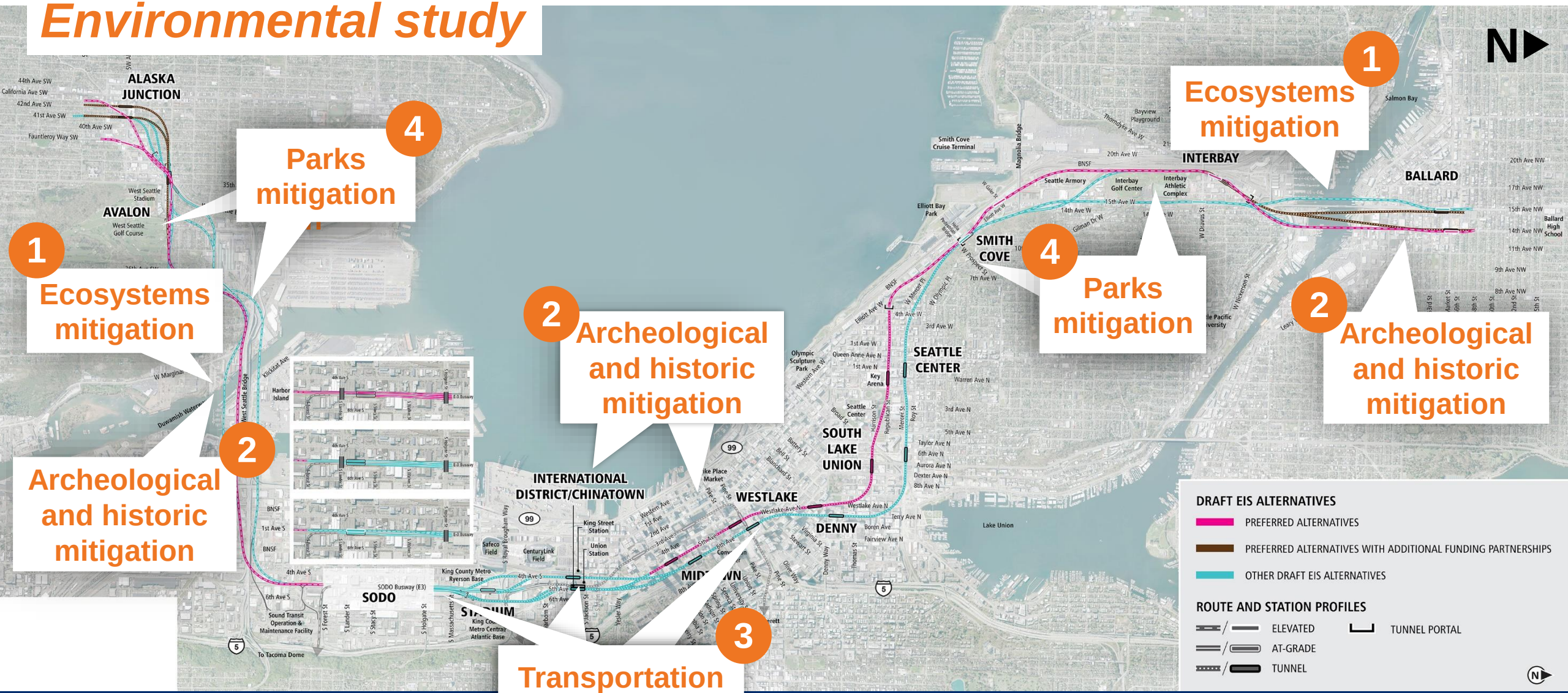
Change in construction cost estimates

Environmental study: +$230M

1. **Ecosystems mitigation** due to potential impacts in the Duwamish River and Salmon Bay.
2. **Archaeological and historic mitigation** in Duwamish, CID, Downtown and Ballard.
3. **Transportation mitigation** due to potential impacts to SODO Busway, streetcar and Link.
4. **Parks mitigation** including Interbay Golf Center and Athletic Complex, Queen Anne Greenbelt, Kinnear Park, Duwamish Greenbelt and West Seattle Golf Course.

Change in construction cost estimates

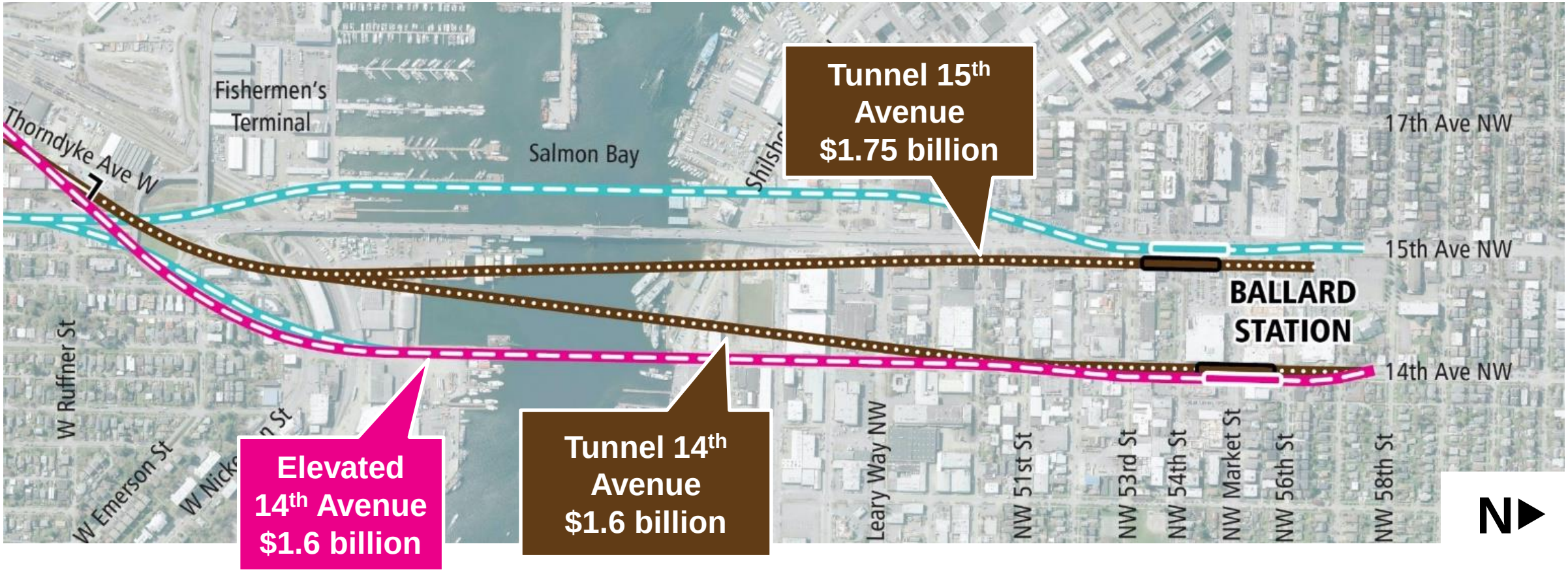
Environmental study



SOUNDTRANSIT

Tunnel alternatives in Ballard

Tunnel alternatives – Ballard

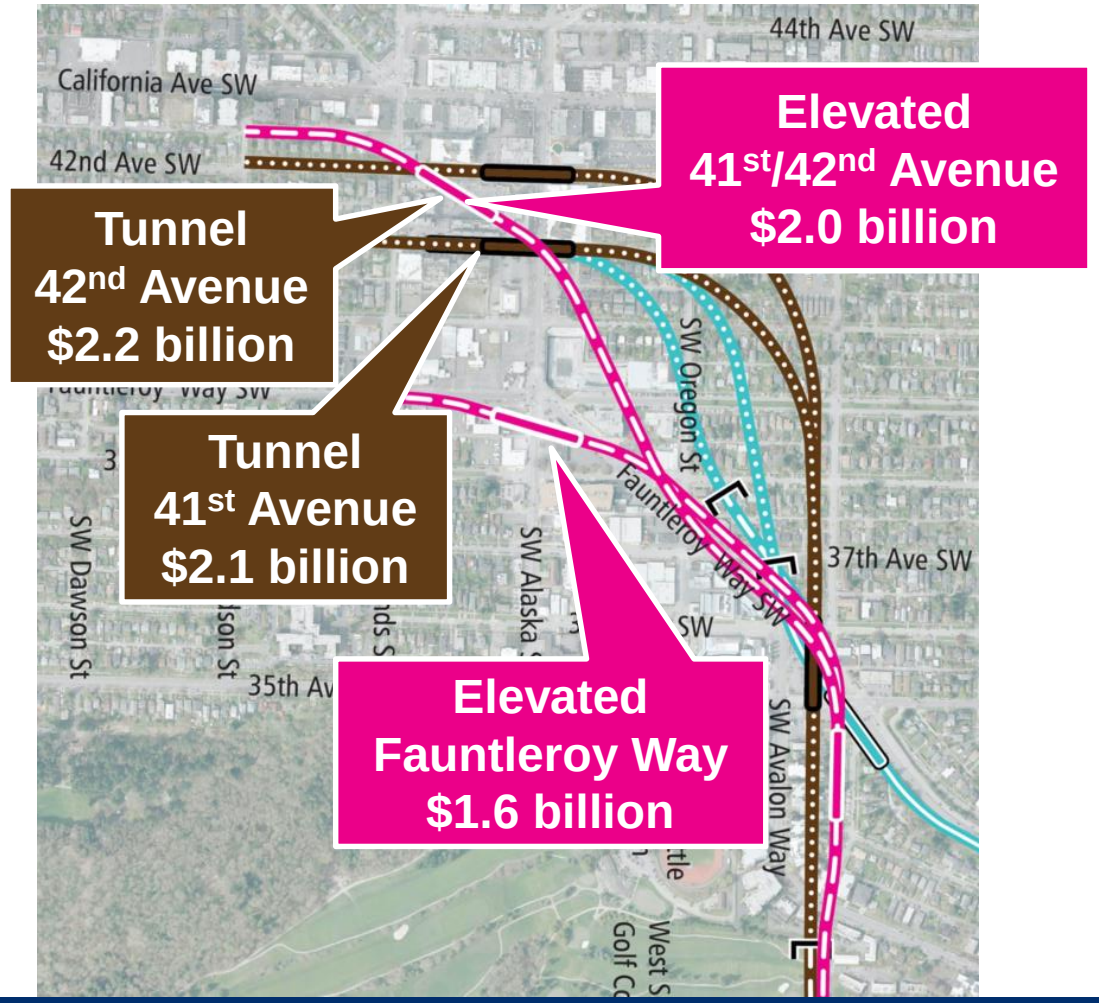


Reflects costs from Interbay Station to Ballard Station.

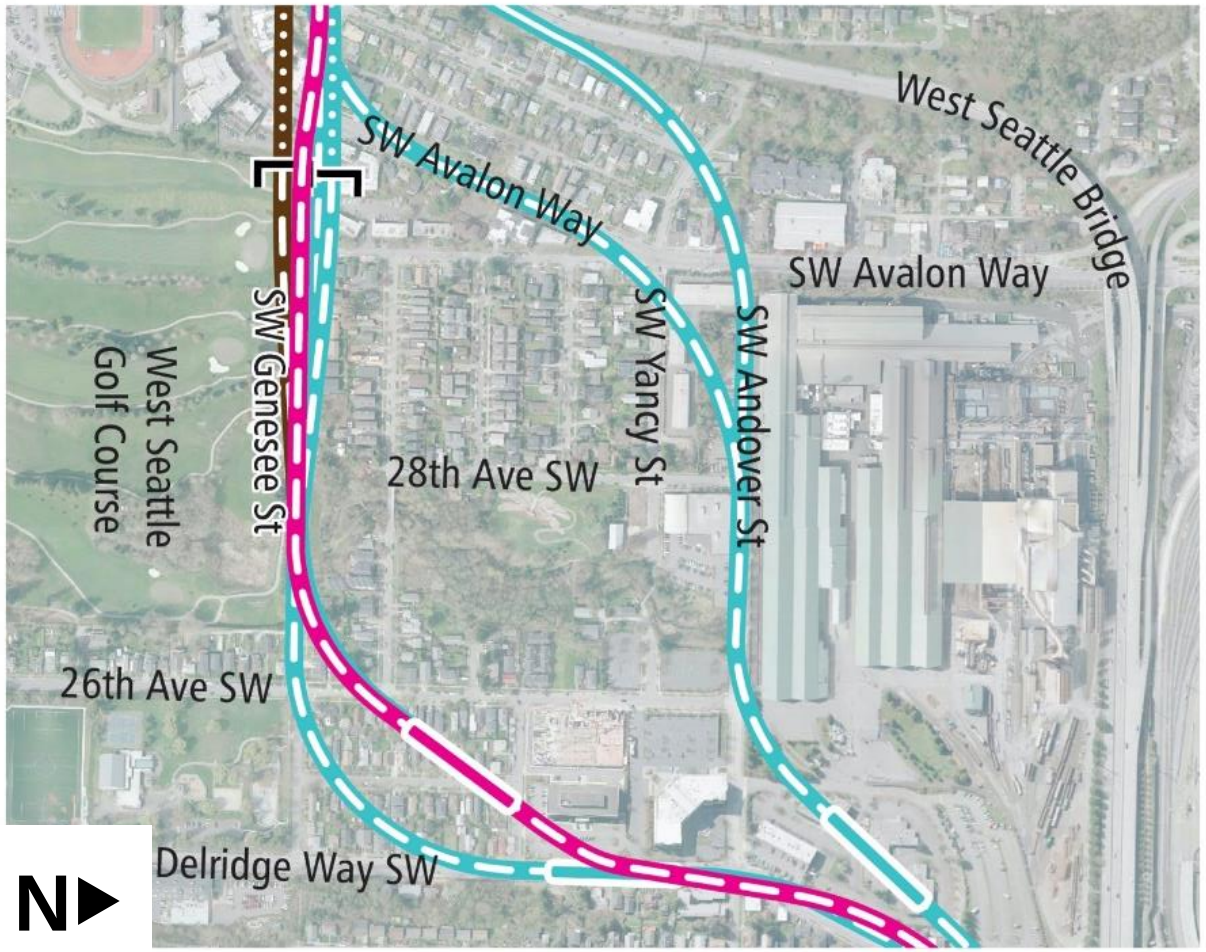
Tunnel alternatives in West Seattle

Tunnel alternatives – West Seattle

West Seattle Junction



Delridge



Reflects costs of West Seattle Junction and Delridge segments combined.

Independent Review & Assessment

The scale of these cost changes merit a third-party, independent review of our methodologies.

Procurement

RFP published 12/07/2020 with deadline of 12/18/2020.

Expect notice of award to highest-ranked firm this week.

Expect notice to proceed by mid/late January 2021.

Deliverable	Schedule
1. Review of cost estimates and trends for WSBLE, TDLE, OMFS, and BRT.	April 2021
2. Programmatic review and analysis of cost estimating methodology for ST3 construction and real estate costs.	June 2021

Engagement with the Board

- Monthly written report to Executive Committee and Committee Chairs.
- Open channel of communication between Executive Committee Chair and consultant.
- Independent consultant presents directly to Board.

Cost Updates to Long-Range Financial Plan

- $5.2 billion (2019$) in assumed costs added for projects in development.
- $2.7 billion (2019$) adjustment assumed for later light rail projects, a 36% increase.
- Total increase to financial plan assumptions: $7.9 billion (2019$), or $12 billion (year-of-expenditure dollars).
- To be adjusted through ongoing design and independent cost estimate review.

Next steps

- Staff will provide a more thorough review of the affordability gap at the January 21, 2021 realignment workshop.
- February System Expansion Committee: Operation and Maintenance Facility South and the Bus Rapid Transit Program.
- Independent review will support further updates to cost assumptions and methodologies.
- Now is the time to identify these challenges when scope choices can still be made to contain cost growth.

Thank you.

SOUNDTRANSIT

soundtransit.org/wsblink