



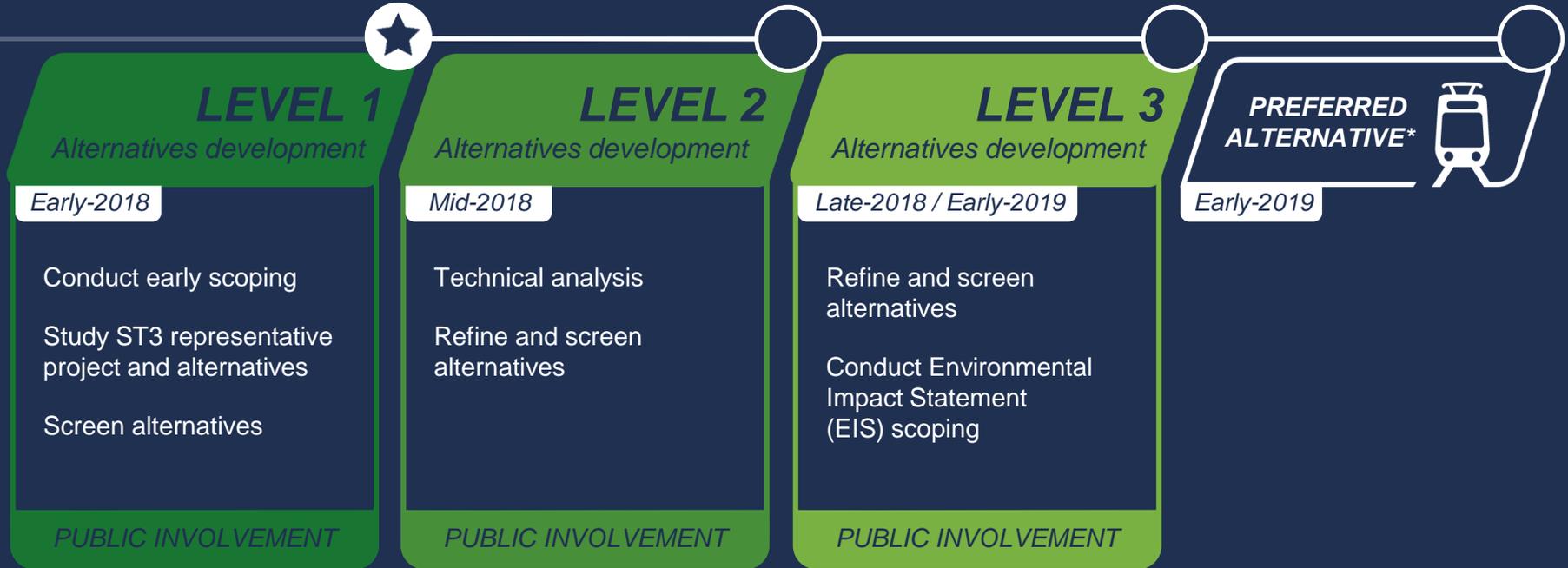
# *West Seattle and Ballard Link Extensions*

*Stakeholder Advisory Group Meeting | July 16, 2018*

# Agenda

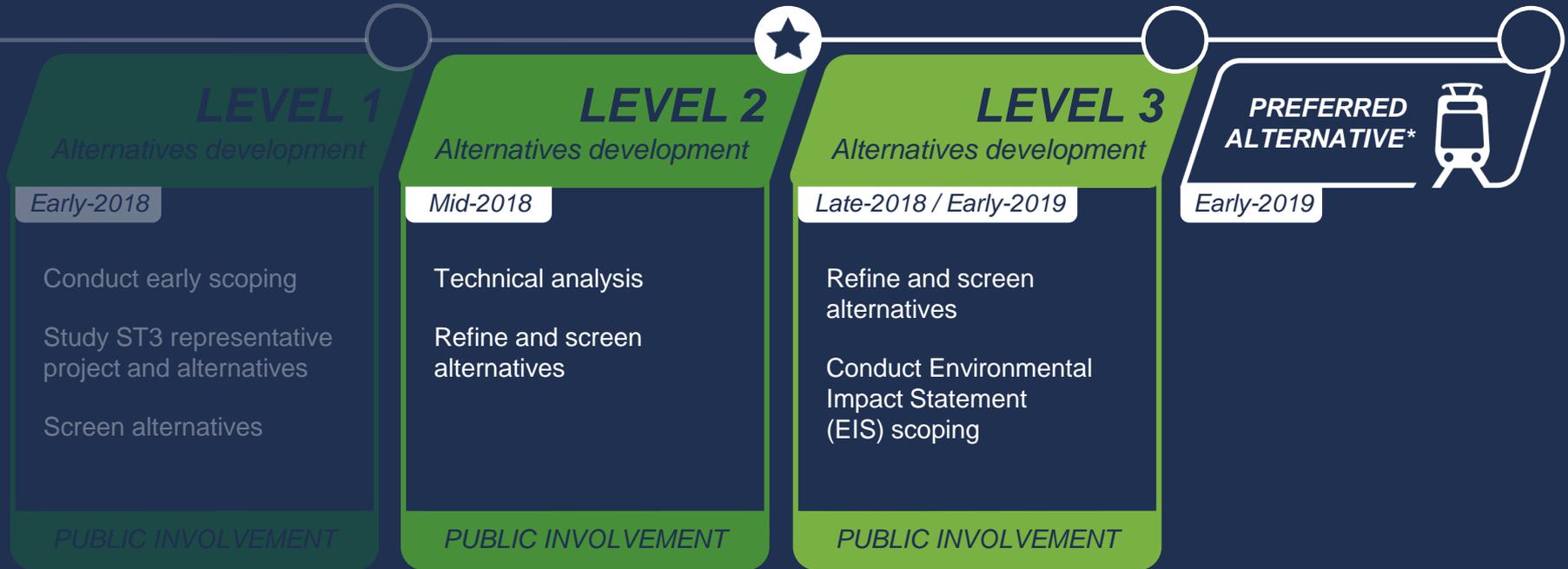
- *Welcome and Introductions*
- *Community Engagement & Collaboration*
- *SODO Evaluation Results & Recommendation*
- *Chinatown-International District Evaluation Results & Recommendation*
- *Technical Briefings*
- *Next steps*

# Alternatives development process



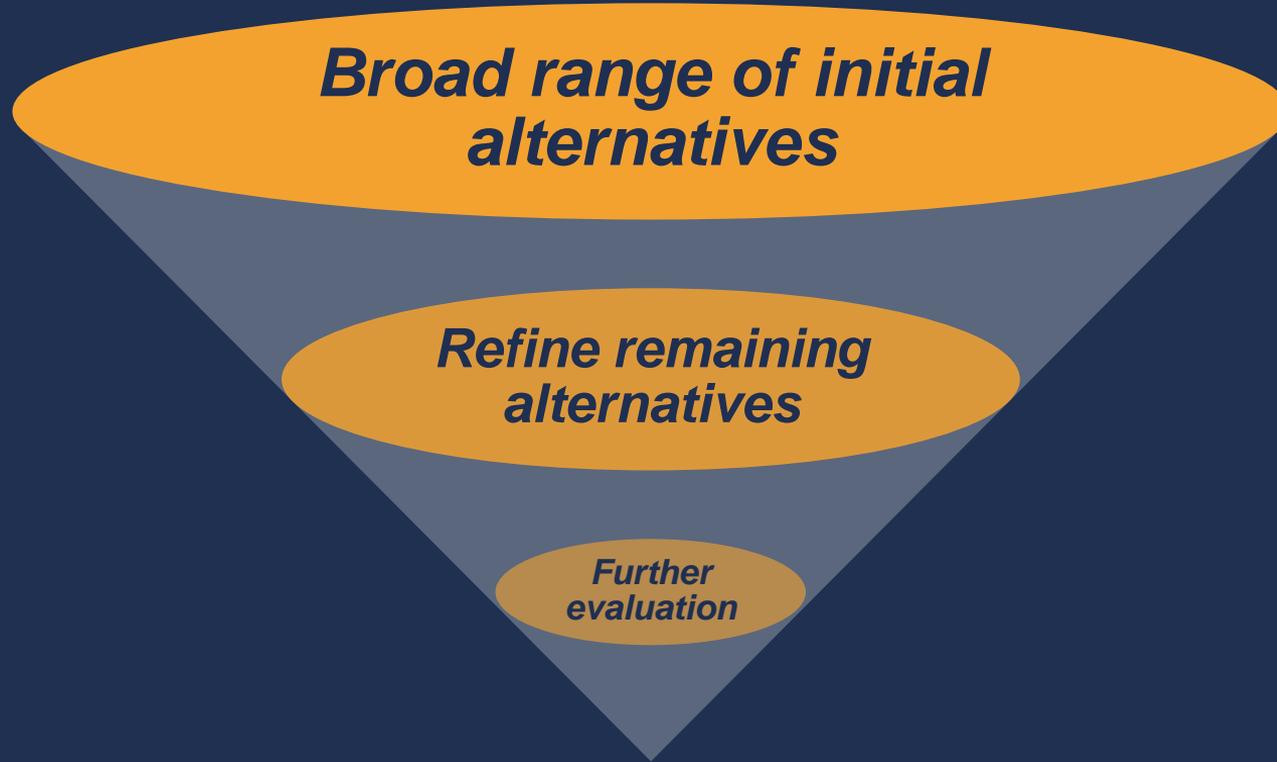
\*The Sound Transit Board identifies preferred alternatives and other alternatives to study.

# Alternatives development process



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

# Screening process



*Preferred Alternative  
and other EIS alternatives*

A photograph of a Sound Transit train at a station platform. The train is white with blue accents and has the number '139B' on its side. The text 'SOUND TRANSIT' is visible on the front and side of the train. The platform has a metal railing in the foreground and a yellow tactile strip along the edge. The background shows the station structure and some overhead equipment. The entire image has a dark blue overlay, and the title 'Community Engagement & Collaboration' is written in large, white, bold, italicized font across the center.

# *Community Engagement & Collaboration*

# Community engagement and collaboration



Meeting dates subject to change.

# External Engagement Report: June 2018



**4** comments and questions



**2** email updates engaging more than  
**3,450** subscribers



**1** Tweet engaging more than  
**82,000** users



**1** post engaging more than  
**29,500** users



**3** social service  
provider interviews



**15** community briefings



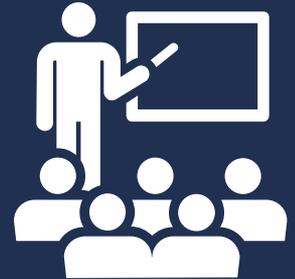
**2** festivals engaging more than  
**350** community  
members



**1** Stakeholder Advisory Group meeting

# June-July briefings snapshot

- ✓ Chinatown-International District BIA (6/7)
- ✓ Seattle Design Commission (6/7)
- ✓ Pigeon Point Neighborhood Council (6/11)
- ✓ South downtown stakeholders (6/12)
- ✓ Seattle Planning Commission (6/14)
- ✓ Neighborcare Health Ballard (6/18)
- ✓ SODO BIA Transportation Committee (6/19)
- ✓ Ballard Food Bank (6/20)
- ✓ Sound Transit Citizen Oversight Panel (6/21)
- ✓ CID Framework Capital Projects  
Coordination Workgroup (6/22)
- ✓ UW Medicine (6/25)
- ✓ NSIA (6/26)
- ✓ Ethiopian Community in Seattle (6/26)
- ✓ West Seattle Food Bank (6/28)
- ✓ Southwest Youth & Family Services (6/29)
- ✓ WSB Station Access Discussion (7/6)
- ✓ Mary's Place (7/10)
- ✓ Central Ballard Residents Council (7/12)
- ✓ South downtown stakeholders (7/12)
- ✓ SODO BIA Transportation Committee  
(7/13)



# 2018 Festivals

- ✓ Morgan Junction Festival (6/16)
- ✓ Festival Sundiata (6/16-6/17)
- ✓ West Seattle Summer Fest (7/13-7/15)
- ✓ Ballard Seafood Fest (7/13-7/15)
- ✓ Dragon Fest (7/14-7/15)
- South Lake Union Block Party (8/10)
- Delridge Day (8/11)
- Celebrate Little Saigon (8/26)
- Night Market (9/8)
- Fishermen's Fall Festival (9/15)
- Sustainable Ballard Festival (9/22)
- Dia de Muertos (10/27-10/28)
- Magnolia Farmers Market (TBD)



# Coming soon: Neighborhood Forums/Open Houses

## West Seattle

*(Includes Delridge, Avalon and Alaska Junction stations)*

## Downtown Seattle

*(Includes Denny, South Lake Union, Seattle Center, Midtown, Westlake, Chinatown-International District, Stadium and SODO stations)*

## Ballard

*(Includes Smith Cove, Interbay and Ballard stations)*

### **Saturday, Sept. 8**

9 – 11:30 a.m.

Seattle Lutheran High School Gym  
(4100 SW Genesee St., Seattle)

### **Tuesday, Sept. 11**

5:30 – 8 p.m.

Ruth Fisher Boardroom,  
Union Station  
(401 S. Jackson St., Seattle)

### **Monday, Sept. 17**

5:30 – 8 p.m.

Ballard Eagleson VFW  
(2812 NW Market St.,  
Seattle)

A photograph of a Sound Transit train at a station platform. The train is white with blue accents and has the number 139B on its side. The text "SOUND TRANSIT" is visible on the front of the train. The platform has a metal railing in the foreground and a yellow tactile strip along the edge. The background shows the station structure and some overhead equipment.

# ***SODO Evaluation Results & Discussion***

# Level 2 alternatives

## SODO and Chinatown-ID

- ST3 Representative Project
- Massachusetts Tunnel Portal
- Surface E-3

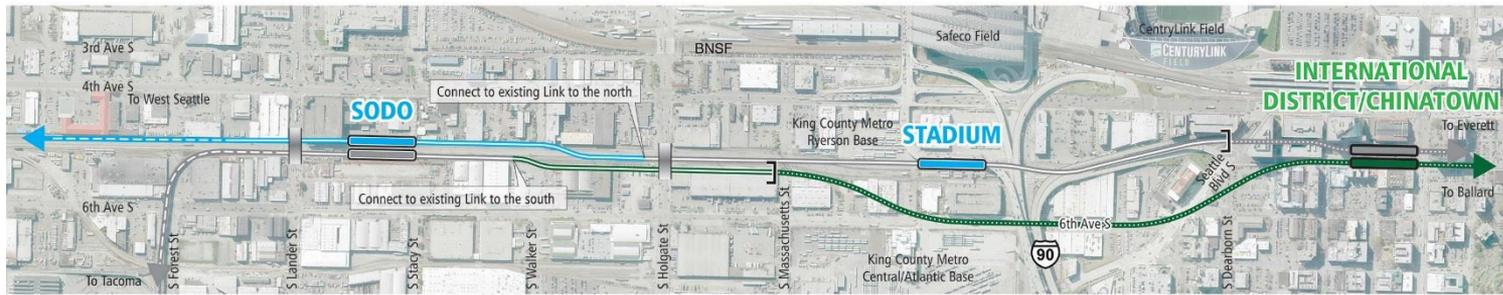


**KEY MAP**

- Red line: West Seattle extension/Station area
- Green line: Ballard extension/Station area

**LEGEND**

- Green line: ST3 representative project - West Seattle extension/Ballard extension
- Blue line: Massachusetts tunnel portal - West Seattle extension/Ballard extension
- Purple line: Surface E-3 - West Seattle extension/Ballard extension
- Grey line: Existing Link light rail
- Black rectangle: Approximate portal location
- Red line: New roadway overcrossing
- Red line: Surface
- Red dashed line: Elevated guideway
- Red dashed line: Tunnel
- Red rectangle: Surface station
- Red rectangle: Elevated station



# SODO and Chinatown-ID – Level 2 alternatives



**KEY MAP**

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

**LEGEND**

- ST3 representative project - West Seattle extension/Ballard extension
- Massachusetts tunnel portal - West Seattle extension/Ballard extension
- Surface E-3 - West Seattle extension/Ballard extension
- Existing Link light rail
- Approximate portal location
- New roadway overcrossing
- Surface
- - - Elevated guideway
- - - - - Tunnel
- Surface station
- Elevated station



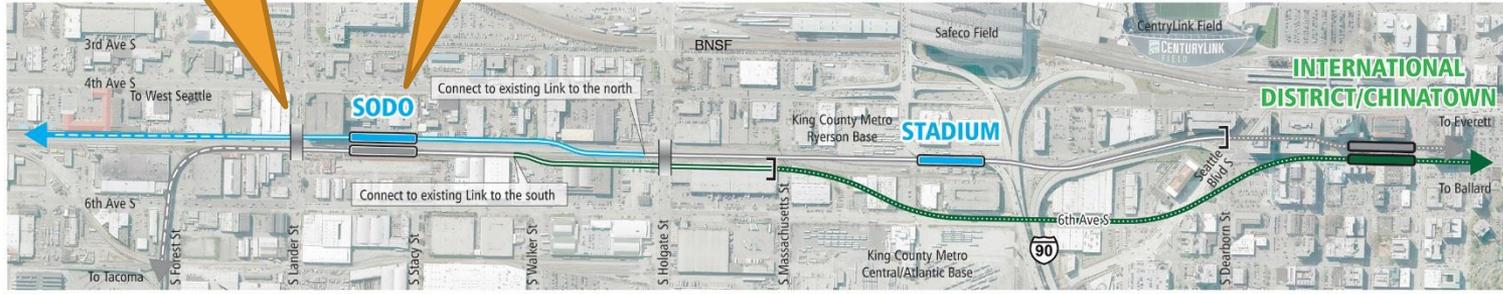
# SODO and Chinatown-ID

Level 2 Alternative – *ST3 Representative Project*



New Lander roadway overcrossing

At-grade SODO Station



= Refinement from Level 1

# SODO and Chinatown-ID

Level 2 Alternative – *Massachusetts Tunnel Portal*



**KEY MAP**

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

**LEGEND**

- ST3 representative project - West Seattle extension/ Ballard extension
- Massachusetts tunnel portal - West Seattle extension/ Ballard extension
- Surface E-3 - West Seattle extension/ Ballard extension
- Existing Link light rail
- Approximate portal location
- New roadway overcrossing
- Surface
- - - Elevated guideway
- - - - - Tunnel
- Surface station
- Elevated station



# SODO and Chinatown-ID

Level 2 Alternative – *Surface E-3*

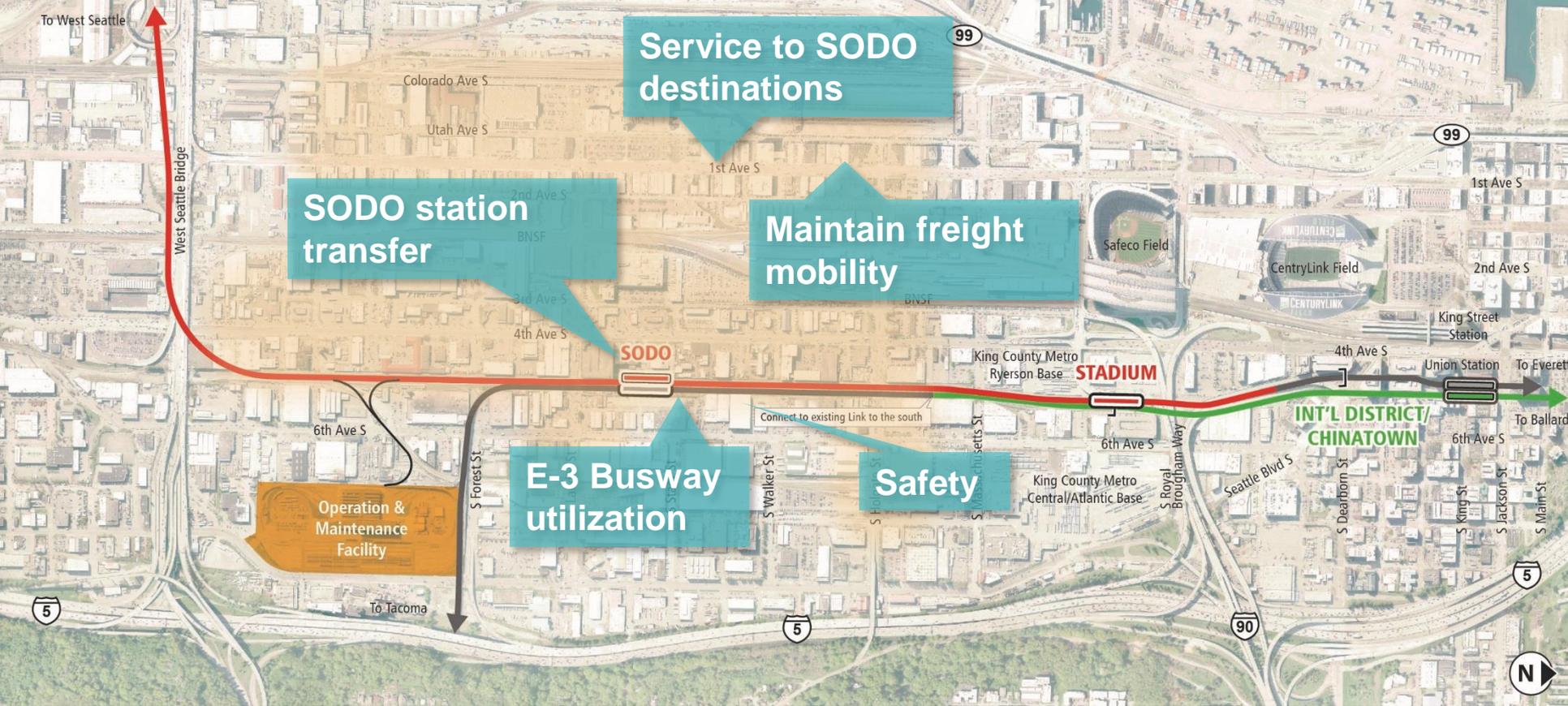
# *Additional feedback*

## *SODO and Chinatown-ID*

- Consider 4th Avenue location for Chinatown-ID station
- Explore alignments further west of ST3 Representative Project

A light rail train is stopped at a station platform. The train is white with blue accents and has the number '139B' on its side. The text 'SODO TRANSIT' is visible on the front of the train. The station platform has a metal railing in the foreground and a digital display board above the train. The background shows a clear sky and some distant structures.

# ***SODO Alignment and Station Alternatives***



# SODO segment community concerns



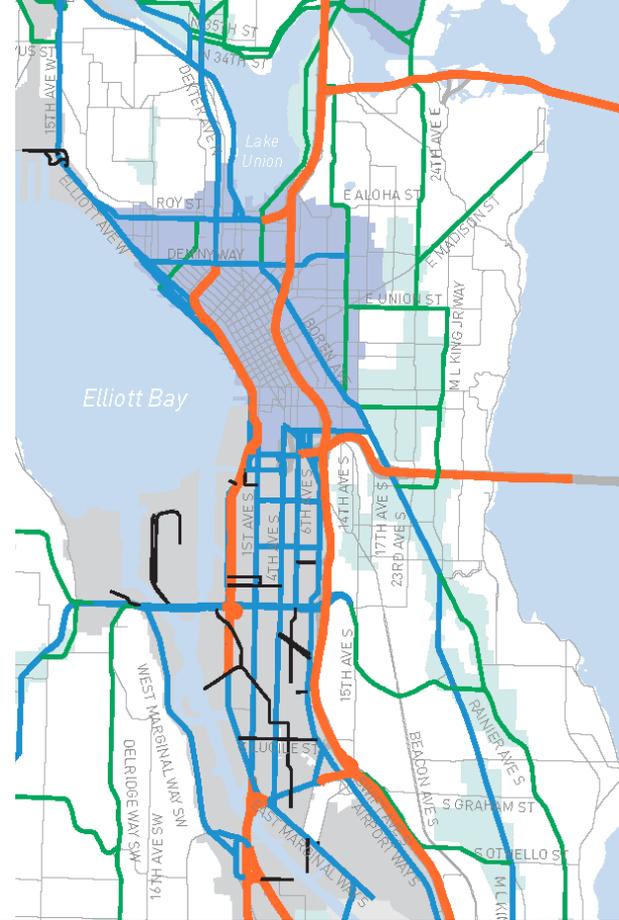
*Service to SODO Destinations*



# *SODO Station Transfer*



# *E-3 Busway Utilization*



**Freight Class**

- Limited Access
- Major
- Minor
- First/Last Mile Connector

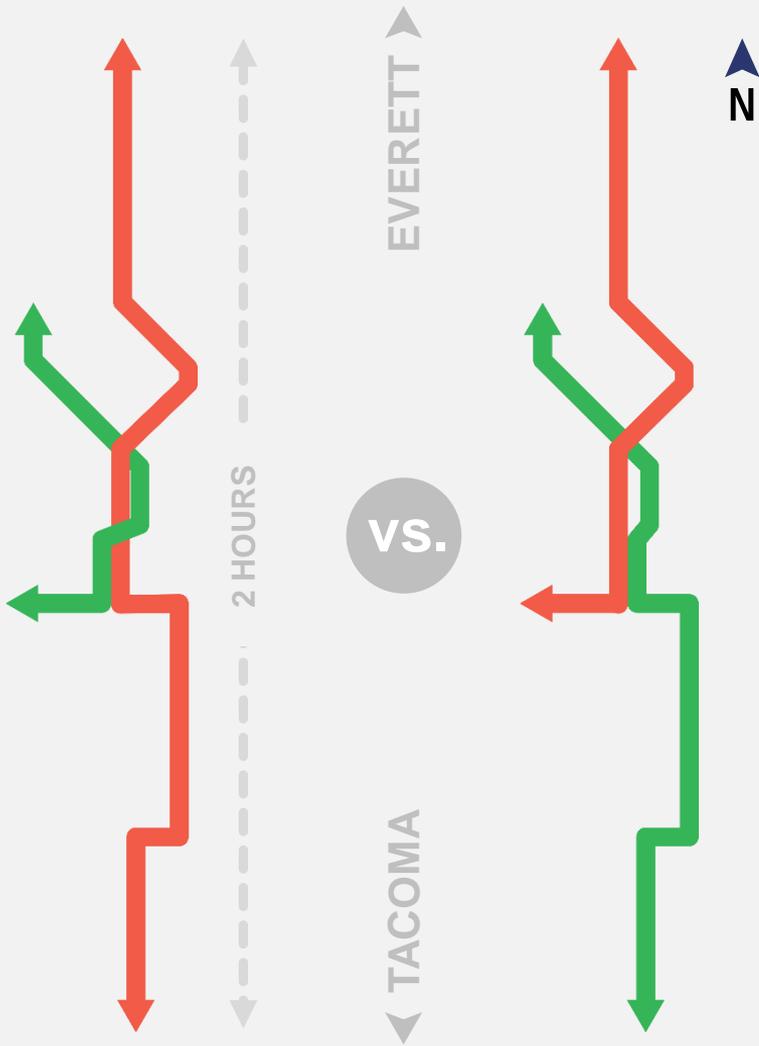
**Urban Villages**

- Urban Center
- Urban Village
- Manufacturing/Industrial Center

# Maintain Freight Mobility





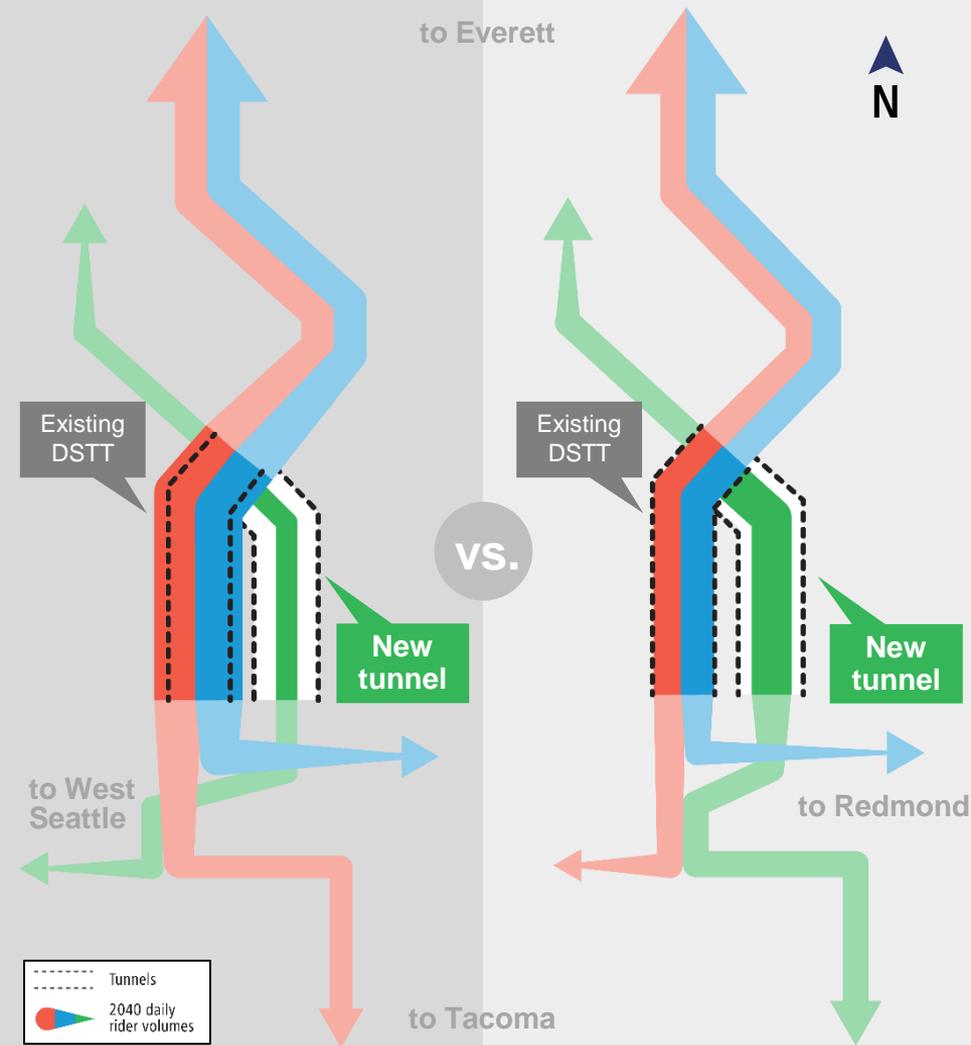


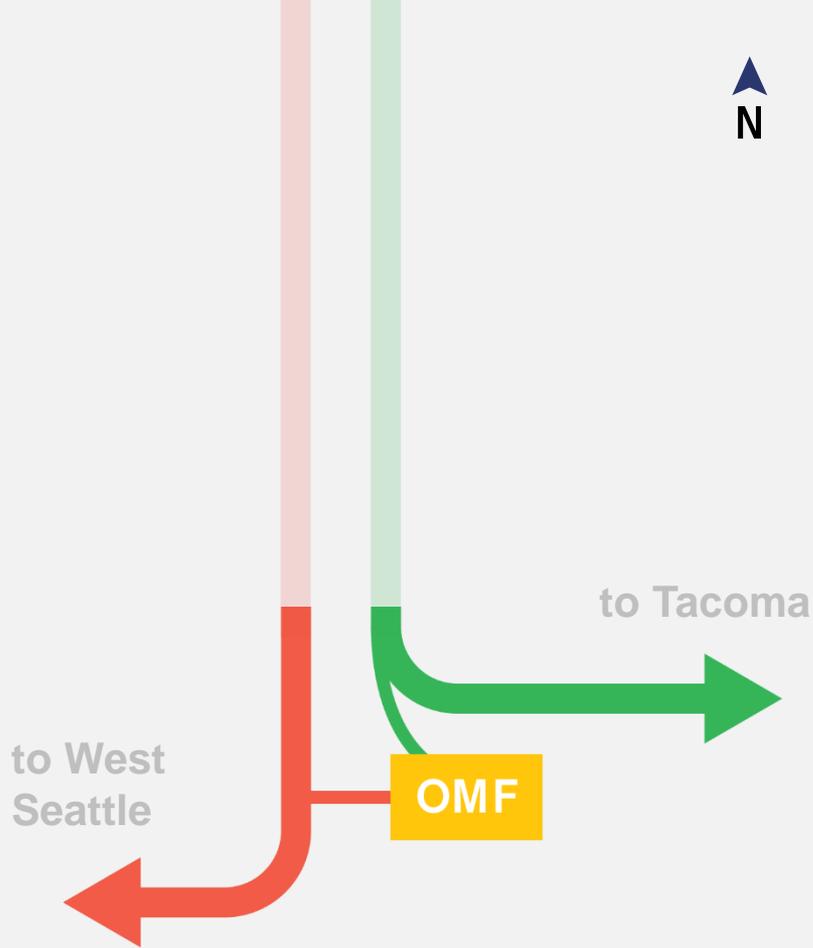
# *Spine segmentation*

- ✓ Splits long trips from Tacoma to Everett

# Balanced loads

- ✓ Balances passenger loads, enabling future growth
- ✓ All users benefit from core capacity expansion





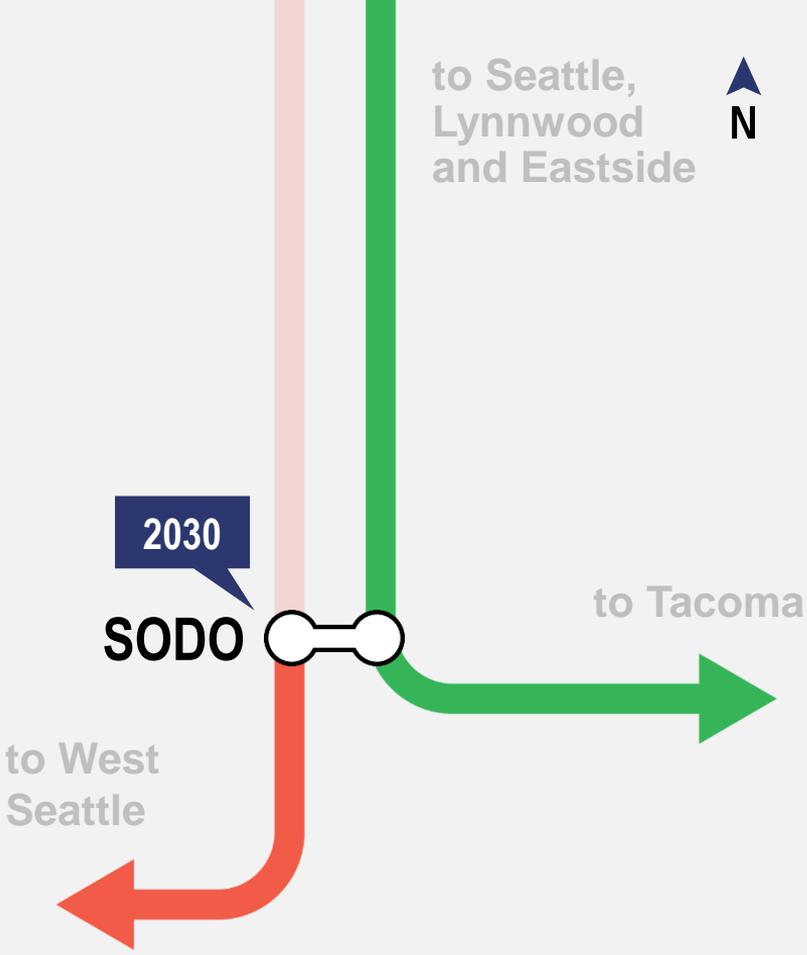
# *Maintenance facility connection*

- ✓ Accommodate connection from West Seattle Link to existing maintenance facility at Forest Street



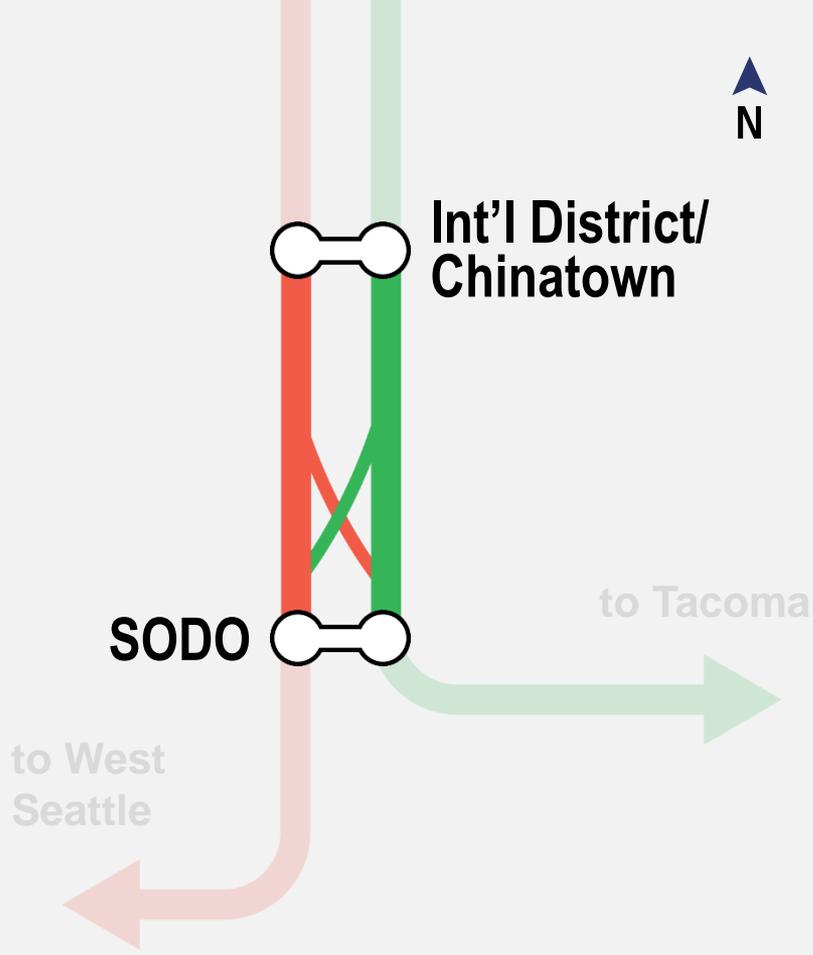
# *Tie-in to existing DSTT*

- ✓ Connect to existing DSTT International District/ Chinatown Station



# *Interim terminus / transfer to Central Link*

- ✓ Accommodate interim transfer to northbound Central Link and permanent transfer to southbound Central Link



# *Track connections between lines*

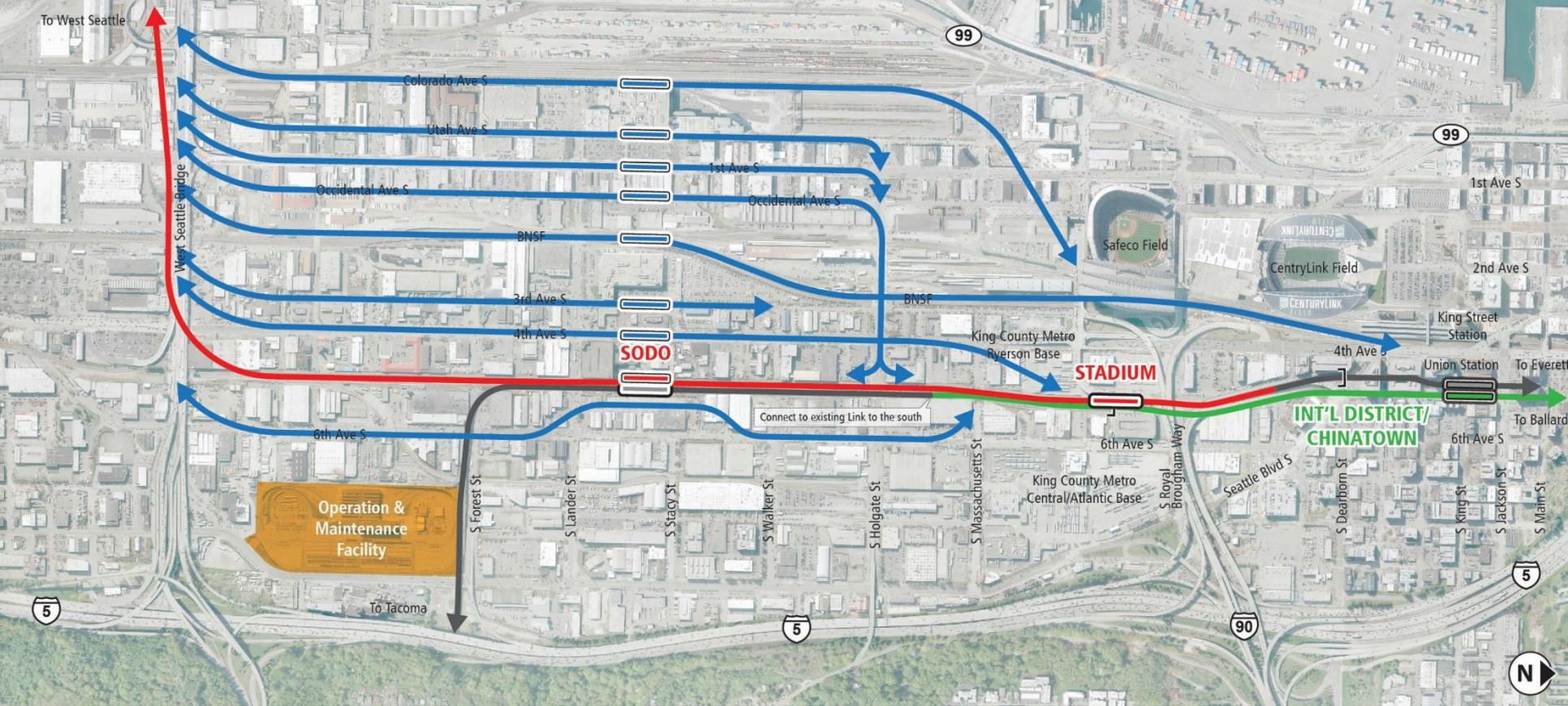
- ✓ Accommodate track connections between West Seattle Link and Ballard Link to allow for movement of trains and failure management

## *SODO community concerns*

- ✓ SODO station transfer
- ✓ E-3 busway utilization
- ✓ Service to SODO destinations
- ✓ Freight mobility
- ✓ Safety

## *Operational needs*

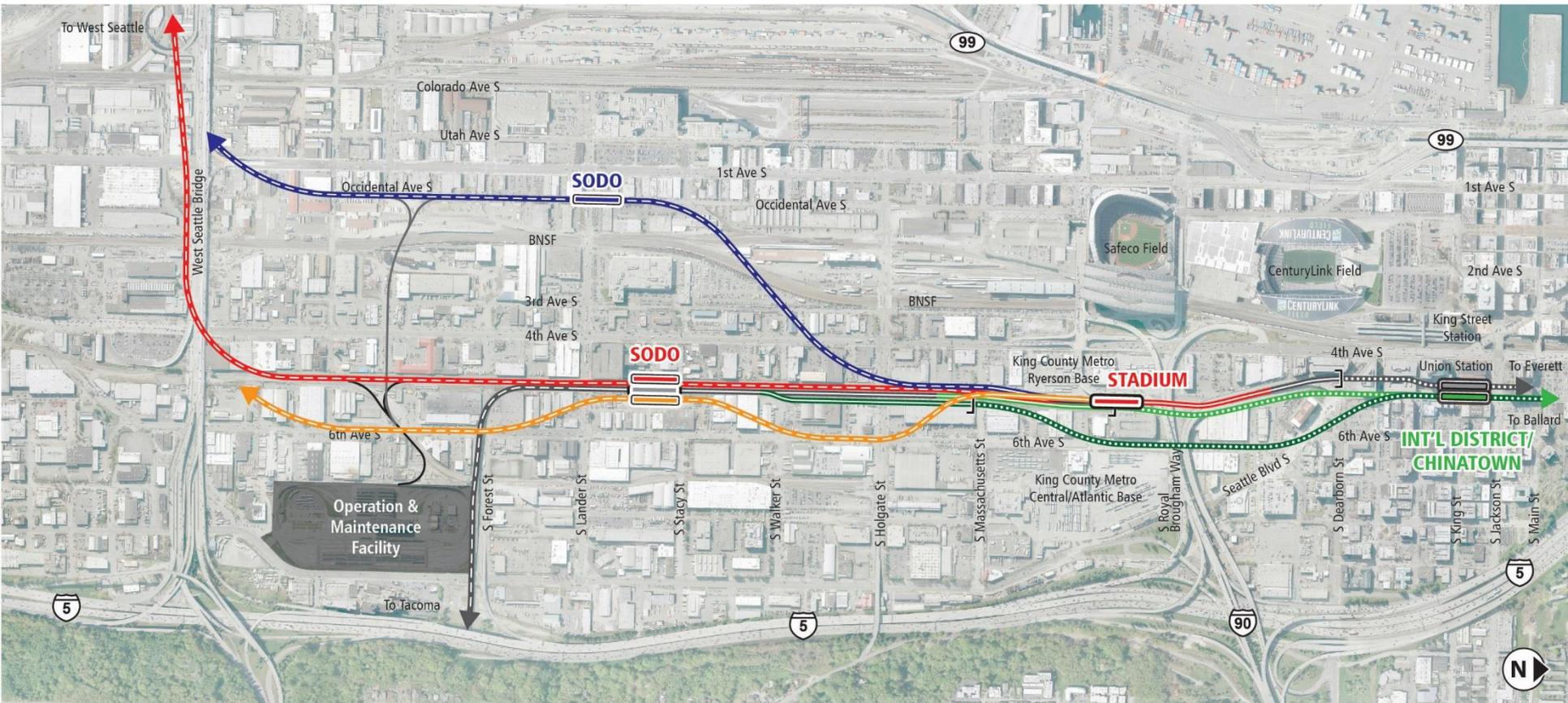
- ✓ Maintenance facility connection
- ✓ Tie-in to DSTT
- ✓ Interim terminus
- ✓ Track connections



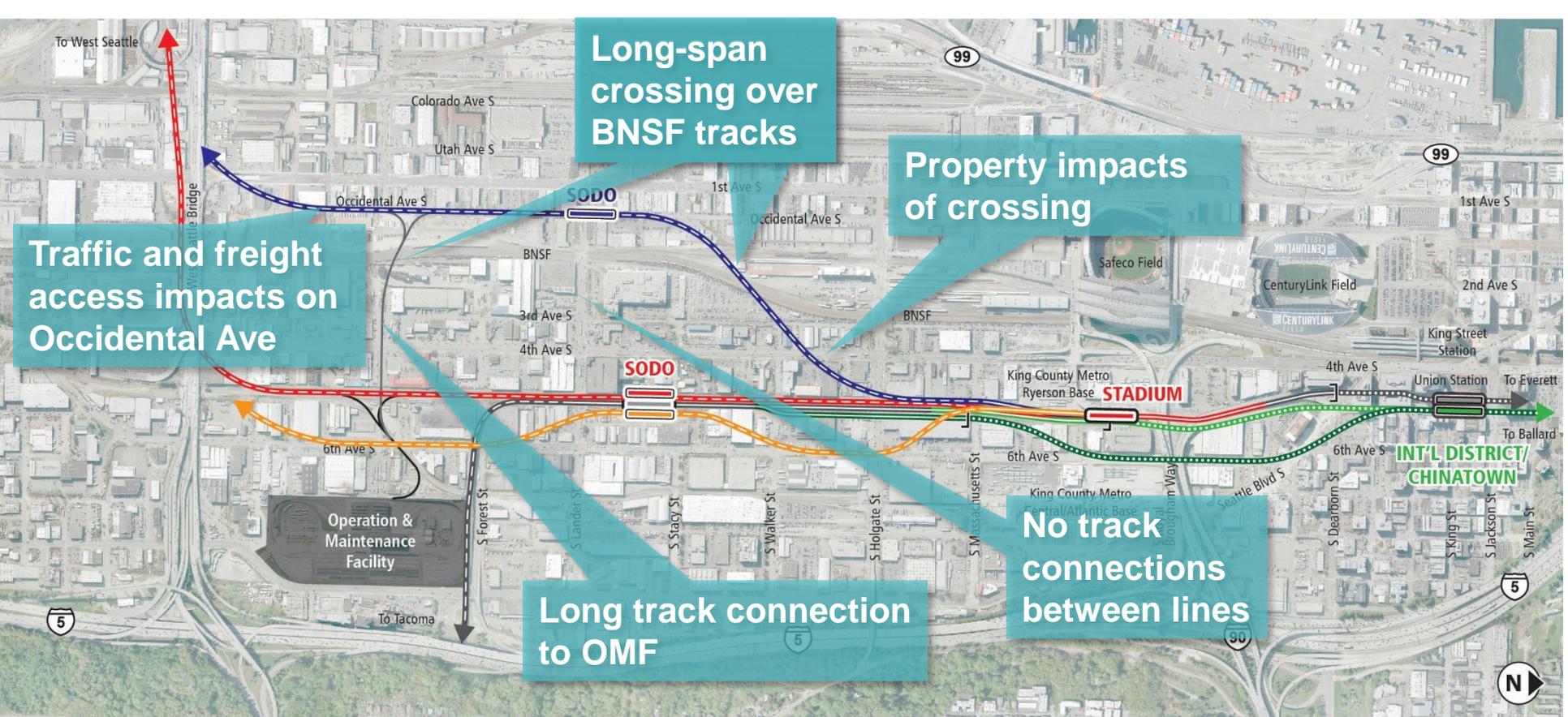
*SODO route ideas from agency workshop*



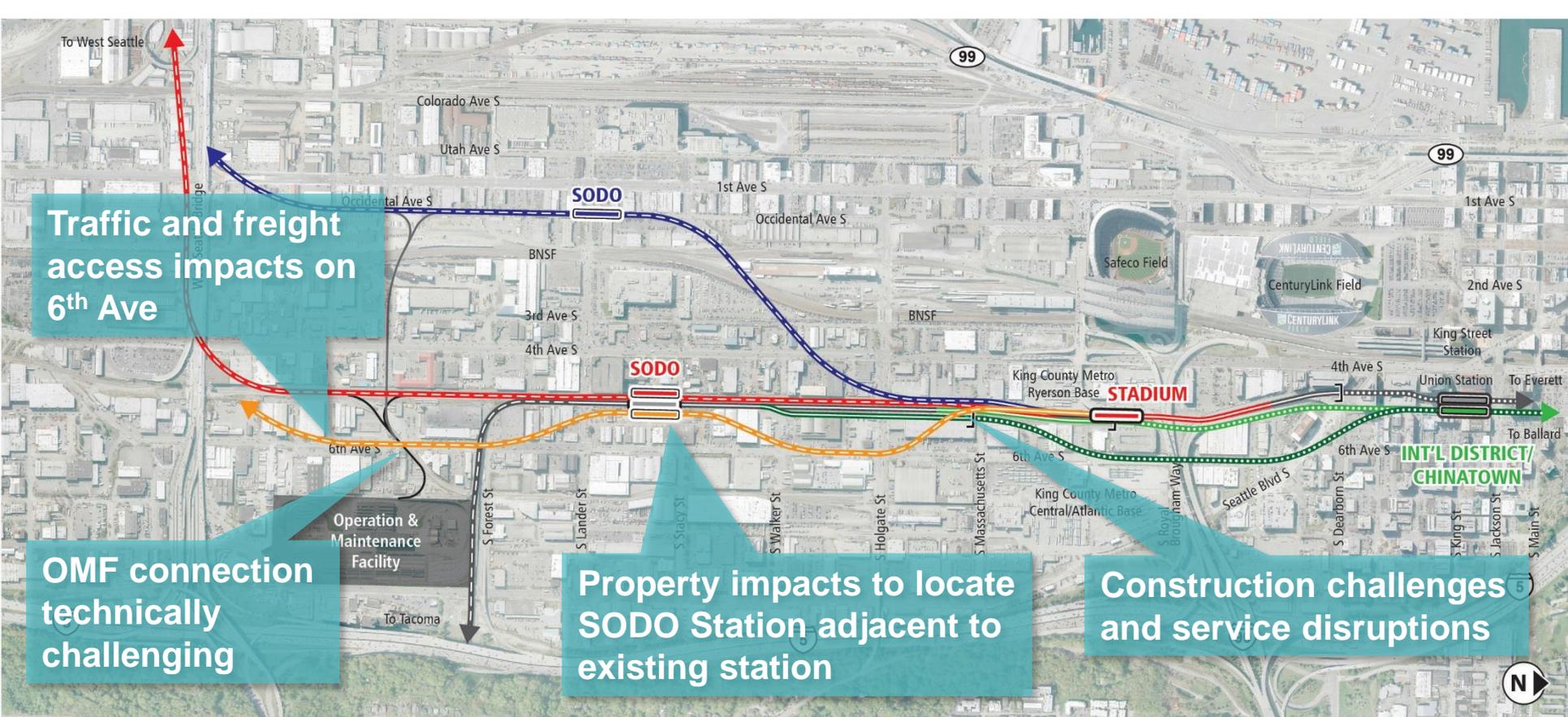




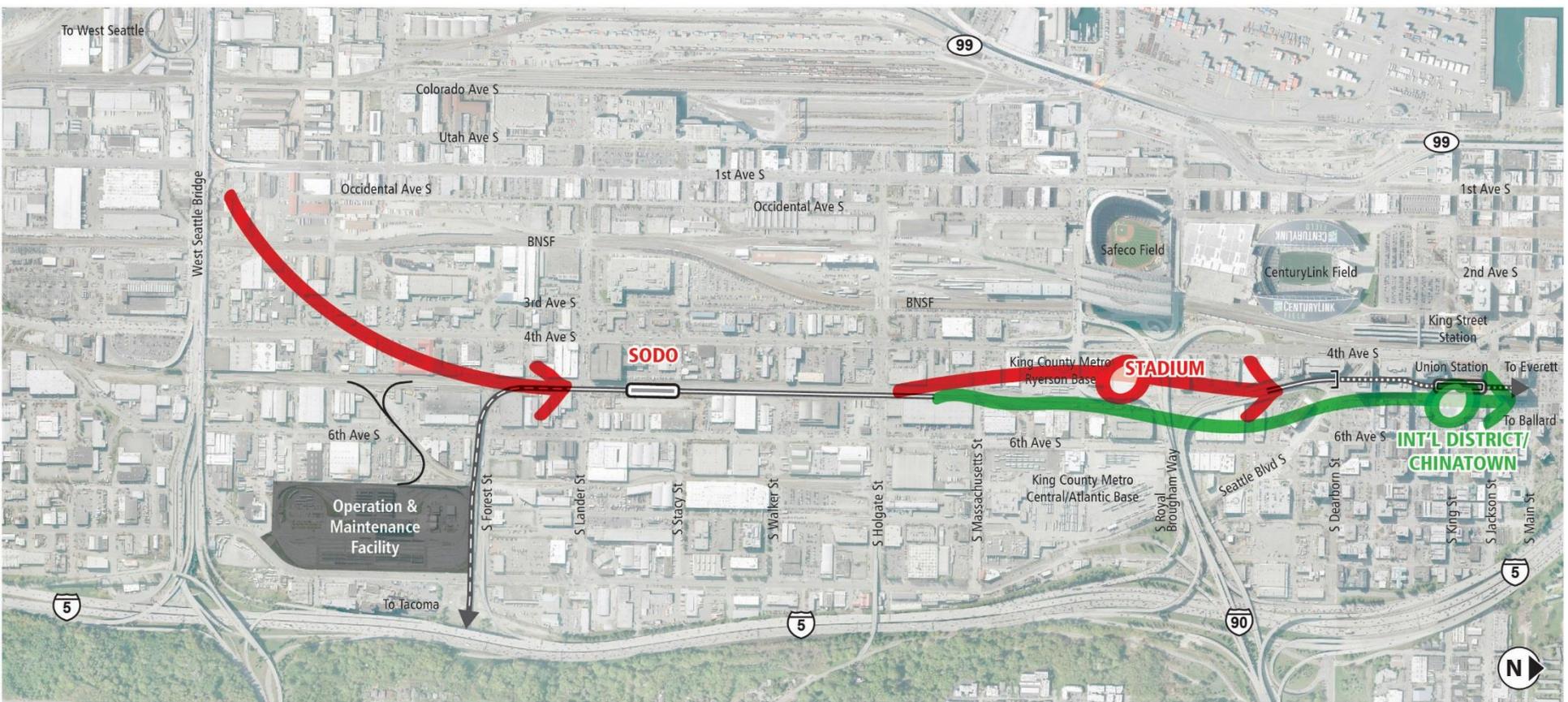
# New SODO Level 1 Alternatives



# Occidental Ave – Key Findings



# 6<sup>th</sup> Ave – Key Findings



**Other suggestions – “Track interlining”**

To West Seattle

Headways on both lines requires grade separation of junctions and impacts continued E-3 use by buses

West Seattle

To Tacoma

Operation & Maintenance Facility

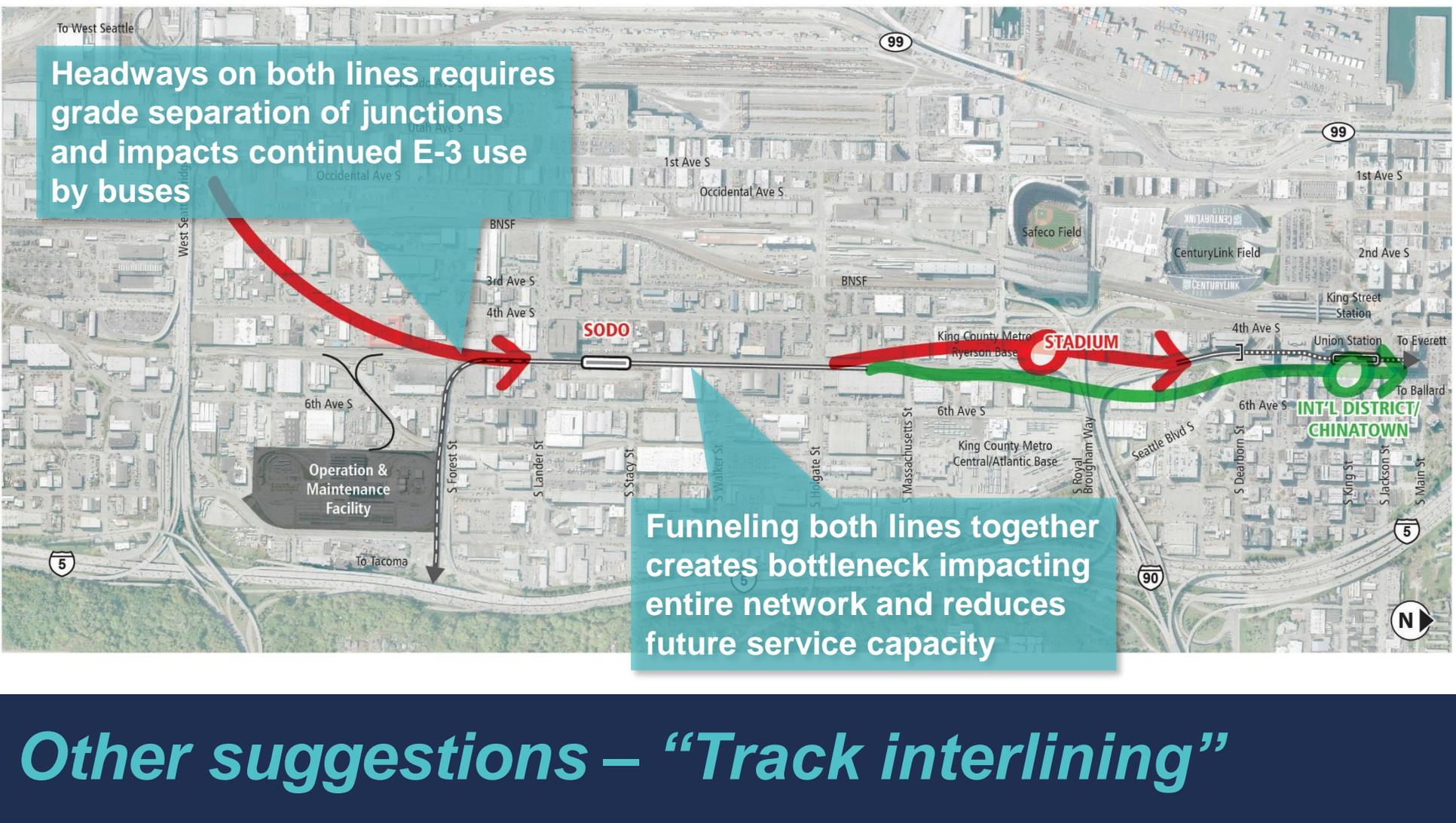
SODO

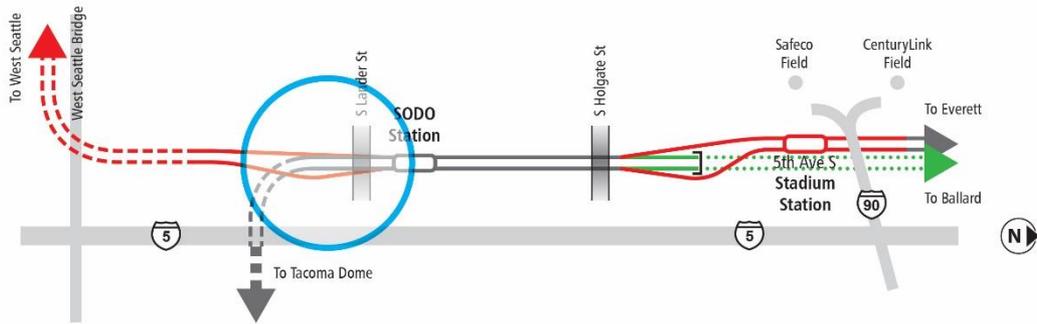
STADIUM

INT'L DISTRICT/ CHINATOWN

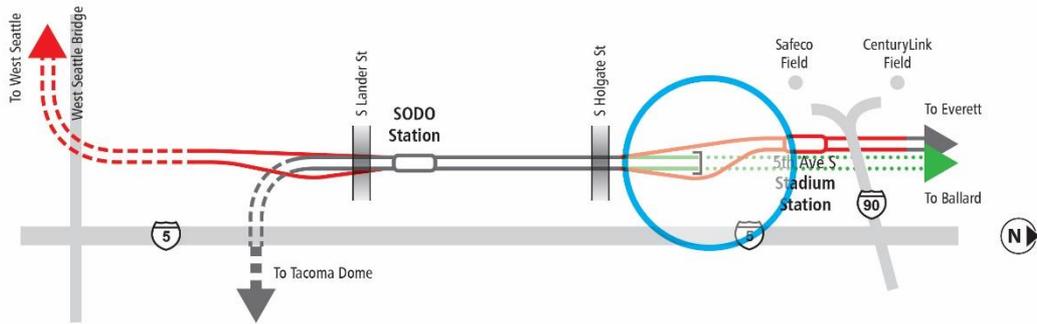
Funneling both lines together creates bottleneck impacting entire network and reduces future service capacity

Other suggestions – "Track interlining"





# Track interlining – Forest Street junction



# Track interlining – Stadium junction



# Other suggestions – “Extended Ballard line”

To West Seattle

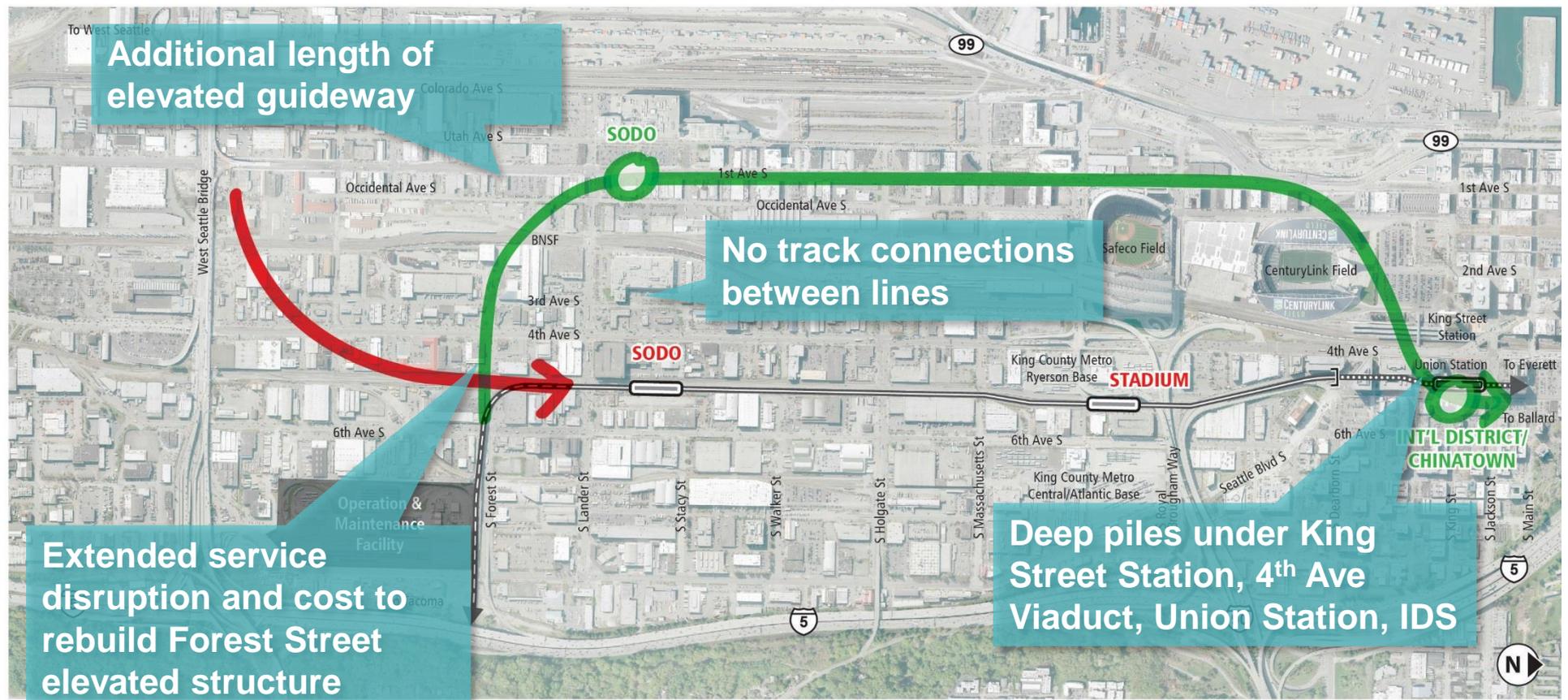
**Additional length of elevated guideway**

**No track connections between lines**

**Extended service disruption and cost to rebuild Forest Street elevated structure**

**Deep piles under King Street Station, 4th Ave Viaduct, Union Station, IDS**

**Other suggestions – “Extended Ballard line”**



# SODO Level 1 Alternatives – Evaluation Results

## Evaluation Criteria and Measures

	Reliable Service	Travel Times	Regional Connectivity	Transit Capacity	Projected Transit Demand	Regional Centers Served	ST Long Range Plan Consistency	Mode, Route, and Station Locations (per ST3)	Potential ST3 Operating Plan Effects	Engineering Constraints	Constructability Issues	Operational Constraints	Qualitative Capital Cost Comparison	Historically Underserved Populations	Station Land Use Plan Consistency	Bus/Rail Integration	Bicycle/Pedestrian Connectivity	Station Area Development Potential	Protected Natural Resources	Protected Buil/Social Environment	Burden on Underserved Populations	Traffic Circulation/Access	Freight Access	Business Commerce
ST3 Representative Project (Baseline)	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐
Massachusetts Tunnel Portal	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐
Surface E-3	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐
Occidental Avenue	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐
6th Avenue	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐

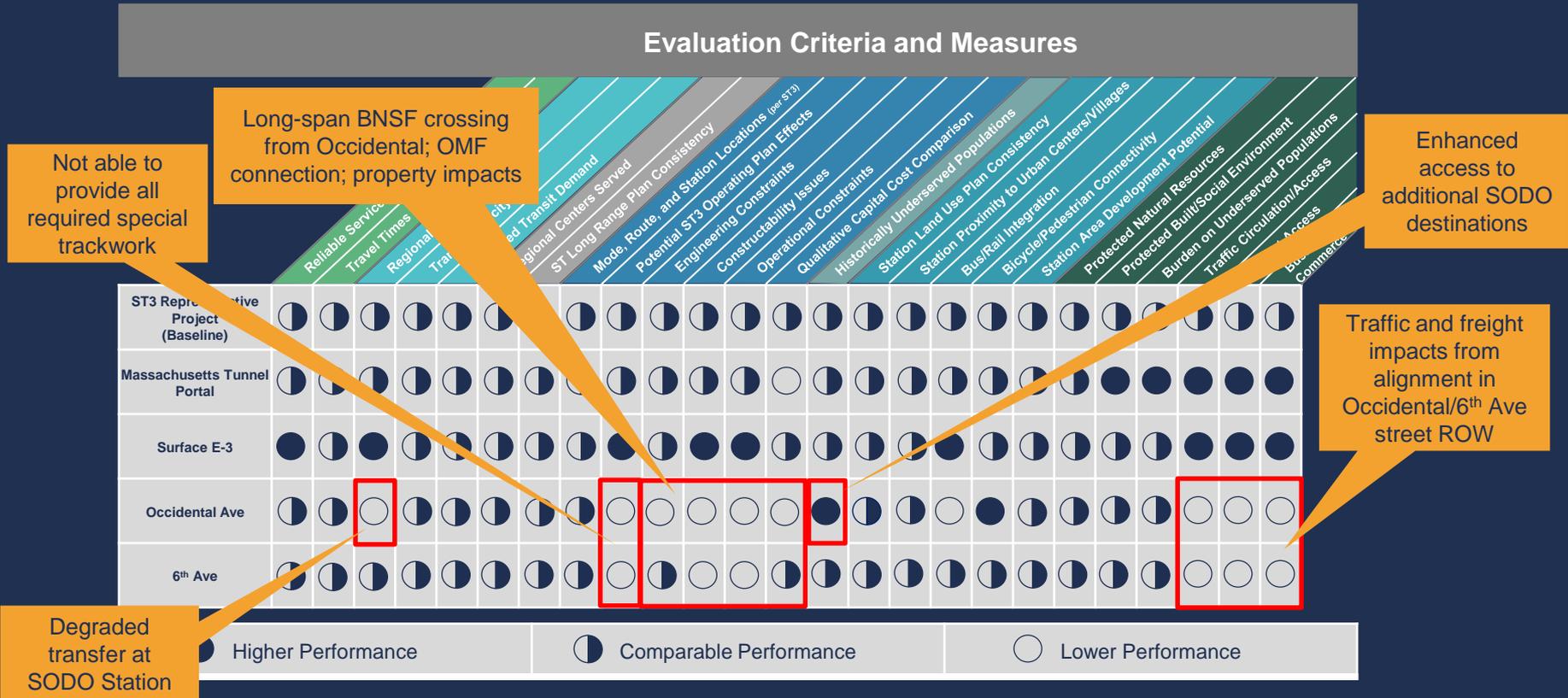
● Higher Performance

◐ Comparable Performance

○ Lower Performance

# SODO Level 1 Alternatives – Evaluation Results

## Evaluation Criteria and Measures



Not able to provide all required special trackwork

Long-span BNSF crossing from Occidental; OMF connection; property impacts

Degraded transfer at SODO Station

Traffic and freight impacts from alignment in Occidental/6th Ave street ROW

Enhanced access to additional SODO destinations

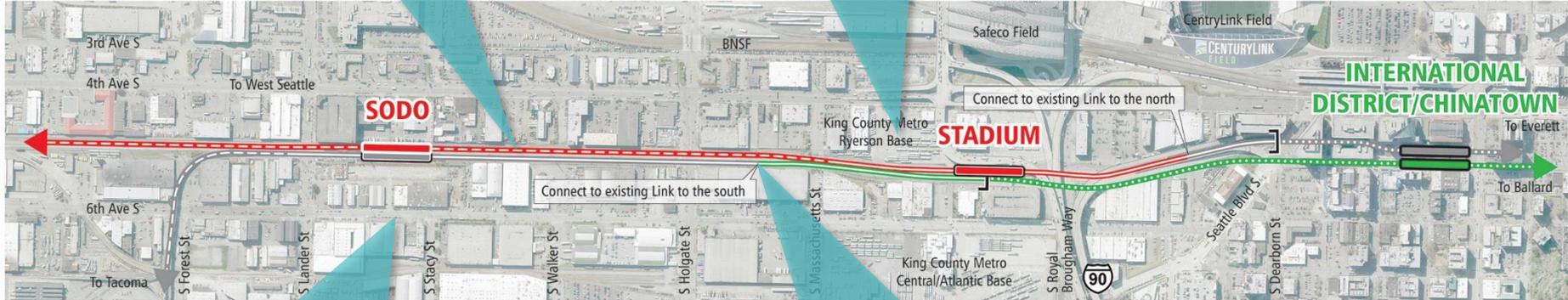
Higher Performance
  Comparable Performance
  Lower Performance



**E-3 Busway – Existing Bus Volumes (PM Peak Hour)**

Confirm future bus volumes expected to use E-3 corridor

Confirm extent of potential Ryerson Base capacity impacts



Assess potential 6th Ave roadway improvements to accommodate bus use

Confirm extent of future bus layover needs

**E-3 Busway – Level 2 technical work**  
**On-going discussions with partner agencies**



Integration of local bus service

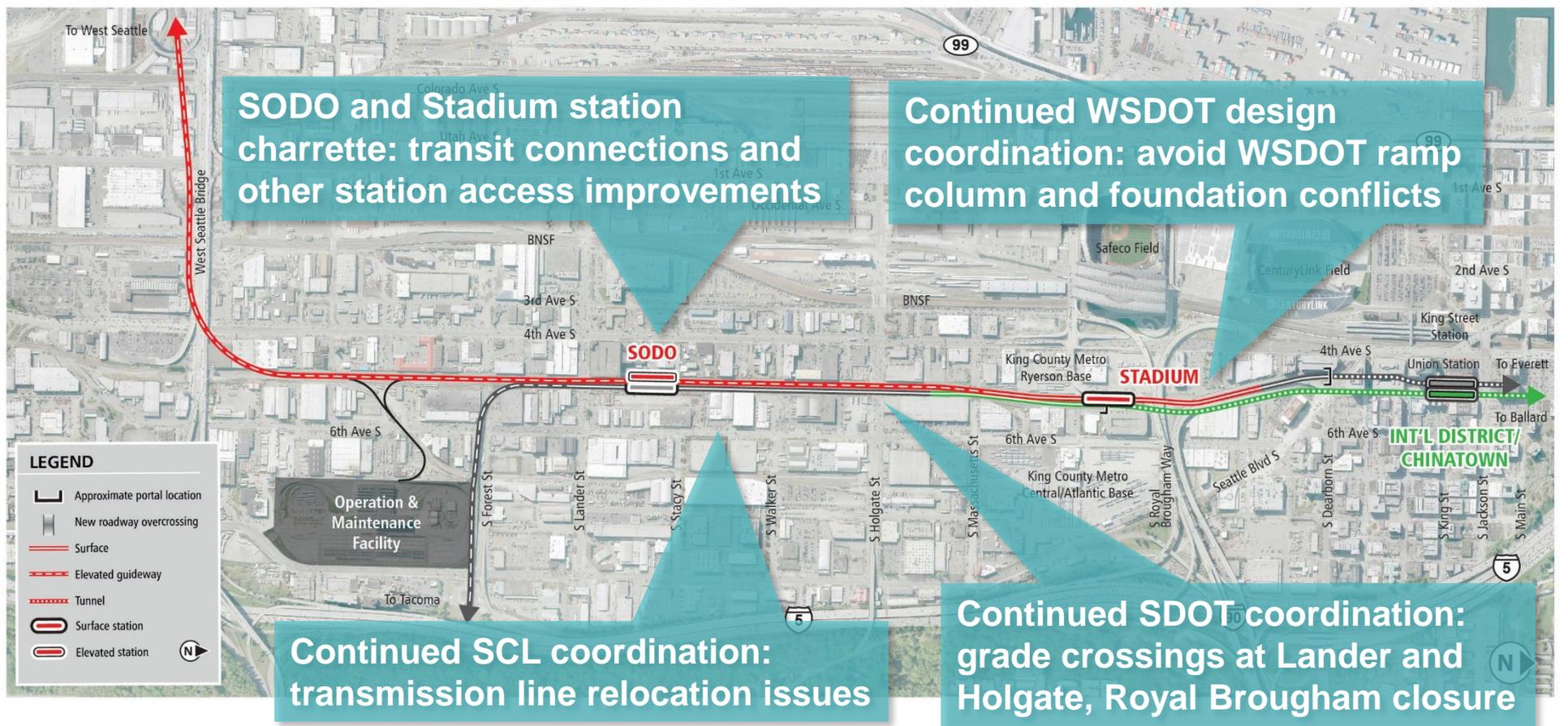
S Lander St

SODO Station

Pedestrian and bicycle access

SODO trail access

# *SODO station access technical work*



**SODO and Stadium station charrette: transit connections and other station access improvements**

**Continued WSDOT design coordination: avoid WSDOT ramp column and foundation conflicts**

**Continued SCL coordination: transmission line relocation issues**

**Continued SDOT coordination: grade crossings at Lander and Holgate, Royal Brougham closure**

**LEGEND**

- Approximate portal location
- New roadway overcrossing
- Surface
- Elevated guideway
- Tunnel
- Surface station
- Elevated station

# Level 2 – other technical work activities

# SODO Alternatives Summary – Level 1

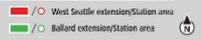
Alternatives with more potential	ST3 Representative Project 	<ul style="list-style-type: none"> <li>• Baseline for comparison</li> </ul>
	Surface E-3 	<ul style="list-style-type: none"> <li>• Moved forward to Level 2</li> </ul>
	Massachusetts Tunnel Portal 	<ul style="list-style-type: none"> <li>• Moved forward to Level 2</li> </ul>
Alternatives with greater challenges	Occidental Ave 	<ul style="list-style-type: none"> <li>• Long-span elevated crossing over BNSF tracks</li> <li>• Traffic and freight access effects on Occidental Ave</li> <li>• Property impacts of alignment crossing from Occidental Ave to Stadium Station</li> <li>• Long track connection to OMF; no track connections between lines</li> </ul>
	6th Ave 	<ul style="list-style-type: none"> <li>• OMF connection technically challenging</li> <li>• Property impacts to locate SODO Station adjacent to existing station</li> <li>• Braiding lines could have major construction challenges and service disruptions</li> </ul>
Not practical concepts	“Track interlining”	<ul style="list-style-type: none"> <li>• Requires grade-separated junctions; does not accommodate buses on E-3</li> <li>• Creates bottleneck; impacts service reliability and limits system capacity</li> </ul>
	“Extended Ballard line”	<ul style="list-style-type: none"> <li>• Rebuild of Forest St junction requires disruption of existing LRT service</li> <li>• Deep mined C-ID station; constructability challenges</li> <li>• Additional guideway length; no track connections</li> </ul>



***Chinatown-ID  
Evaluation Results &  
Discussion***



**KEY MAP**

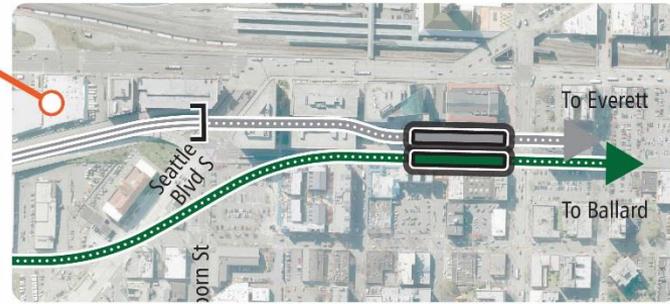


**LEGEND**

- █ ST3 representative project - West Seattle extension/Ballard extension
- █ Massachusetts tunnel portal - West Seattle extension/Ballard extension
- █ Surface E-3 - West Seattle extension/Ballard extension
- Existing Link light rail
- Approximate portal location
- New roadway overcrossing
- Surface
- Elevated guideway
- - - - - Tunnel
- Surface station
- Elevated station



**Station location alternative (straddle S Jackson St)**  
 Note: applicable to both cut and cover and bored tunnel alternatives



**Bored tunnel alternative**  
 Reduces in-street cut-and-cover construction from 1,600' to 400'

# C-ID alignment and station alternatives

# *Additional feedback*

## *SODO and Chinatown-ID*

- Consider 4th Avenue location for Chinatown-ID station
- Explore alignments further west of ST3 Representative Project



Improve intermodal connections

Activate Union Station

Minimize Chinatown-ID construction impacts

# *Chinatown-ID community concerns*



Desire for better and safer connection to King Street Station

Opportunity to partner on 4th Ave viaduct rebuild

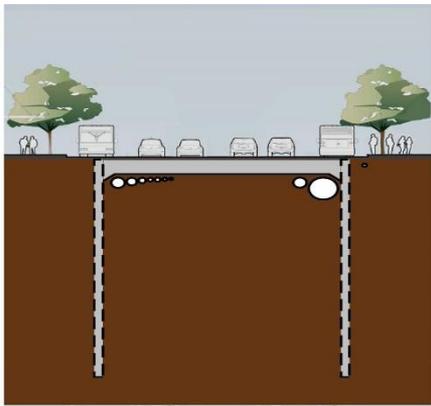
Avoid affordable housing impact

Traffic impacts of construction on 4th Ave

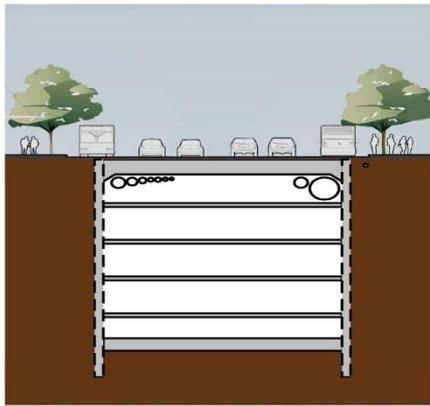
Trolley bus access

Avoid fire station and emergency operations center impact

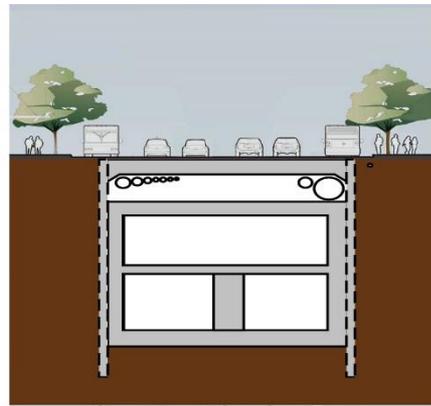
# *Agency workshop feedback*



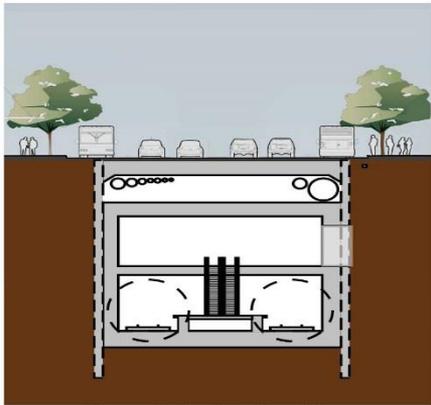
**Install Piles and Decking**



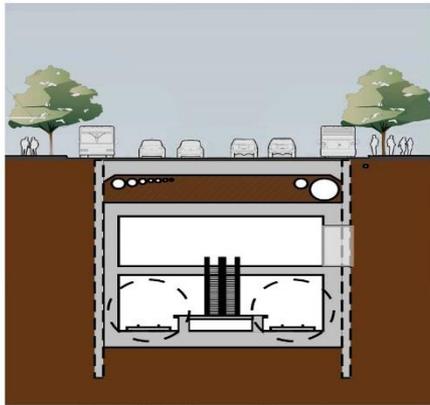
**Excavate and Install Supports  
(from beneath decking)**



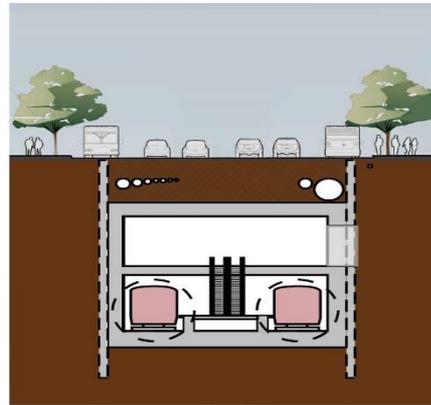
**Construct Station Box**



**Complete Station Box**

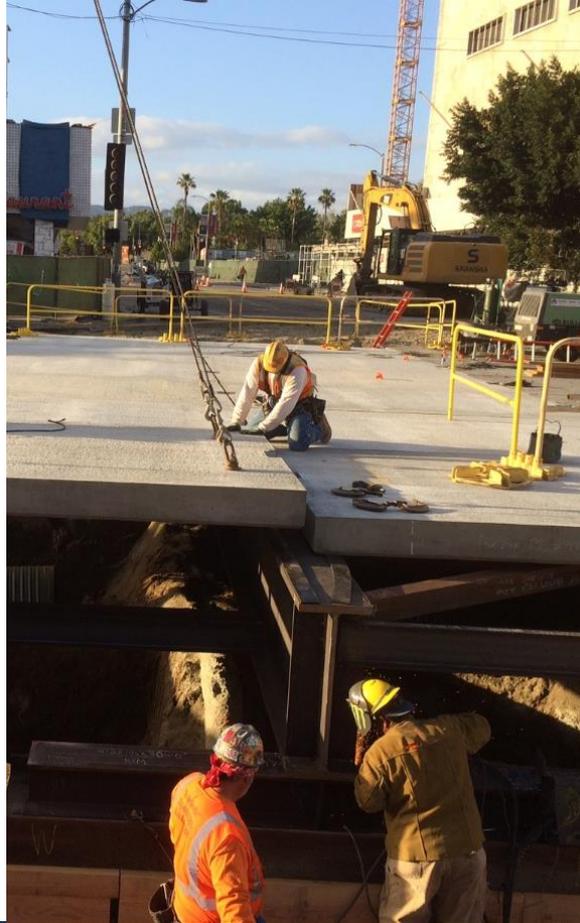


**Backfill Above Structure**

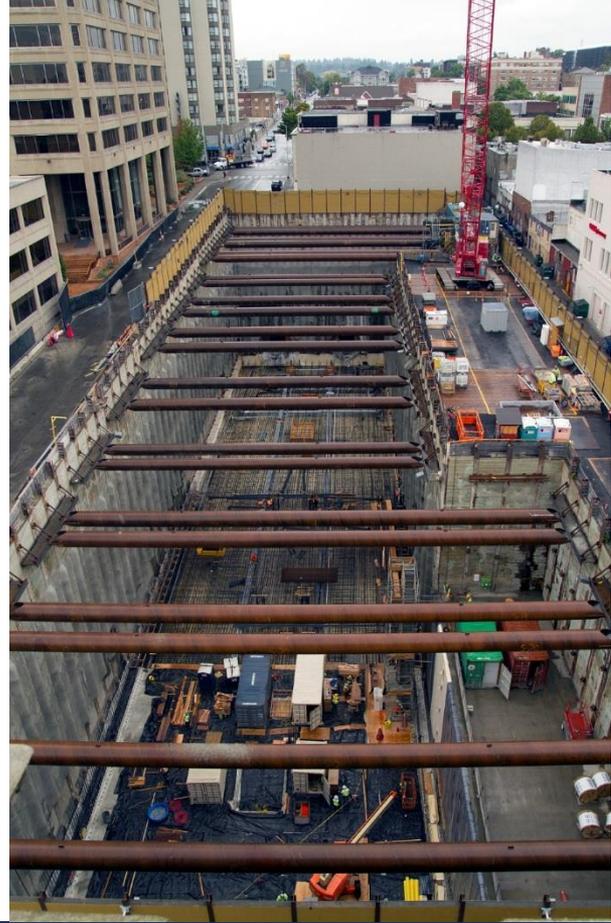


**Remove Decking and  
Restore Street**

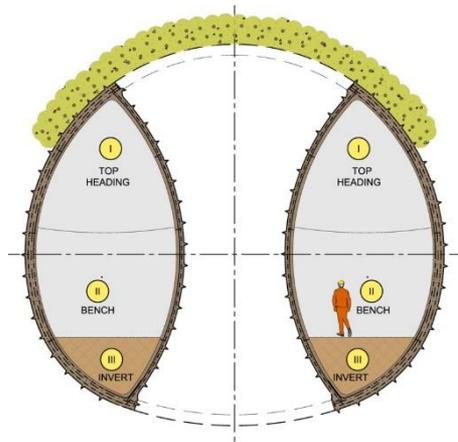
# *Cut and Cover Station Construction*



# *Cut and Cover Station Construction*



# *Open Cut Station Construction*



# Mined Station Construction

# *Underground Stations in Seattle*

## *Cut-and-cover stations:*

- Pioneer Square, University Street (DSTT)

## *Open-cut stations:*

- U District, Roosevelt (Northgate Link)
- Capitol Hill, UW (U-Link)
- International District/Chinatown, Westlake, Convention Place (DSTT)

## *Mined stations:*

- Beacon Hill (Central Link)

# *C-ID Station Construction Constraints*

## *Initial technical challenges*

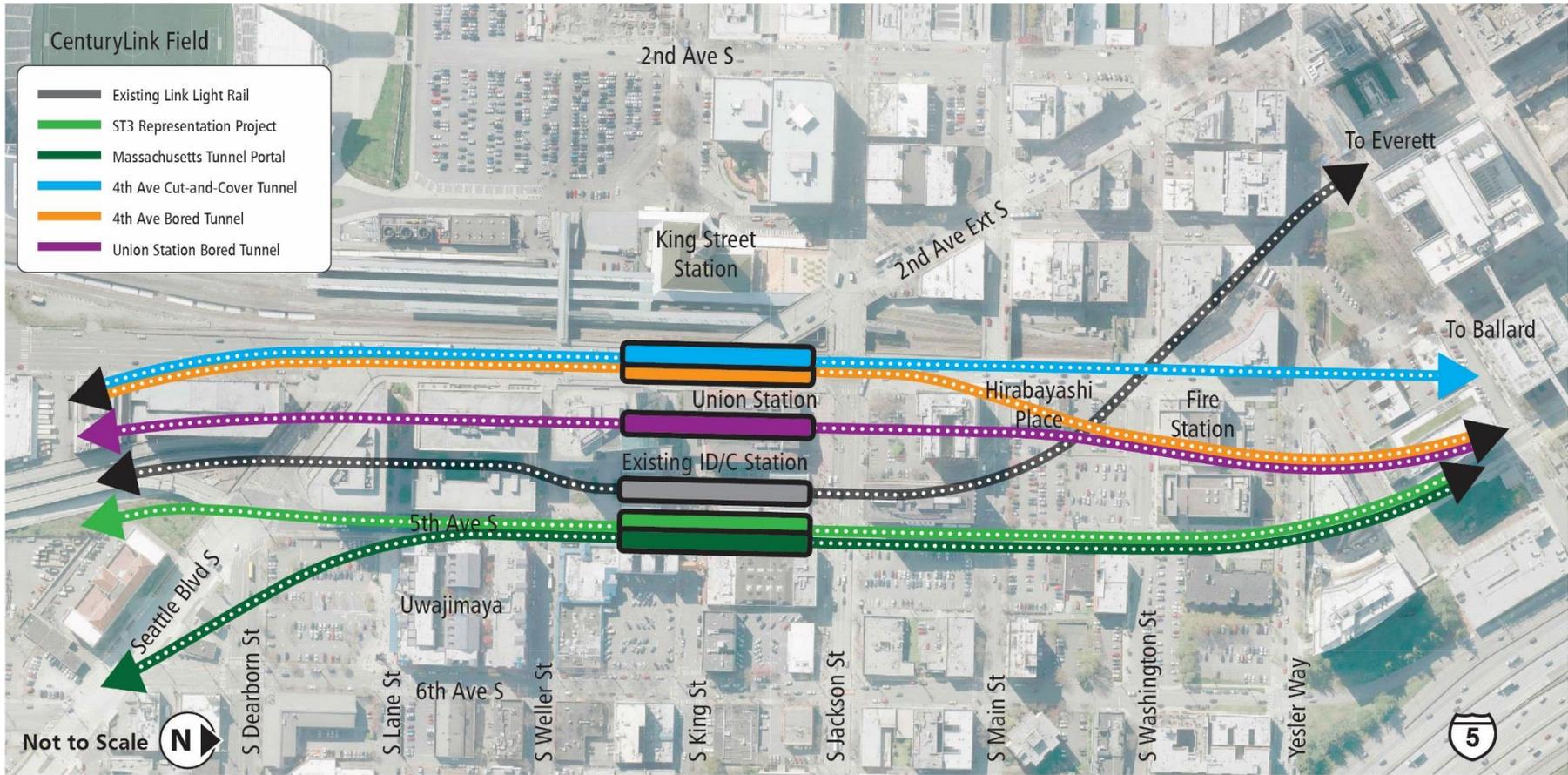
- Limited right-of-way
- Poor soil conditions
- Deep piles under 4th Ave, Union Station, existing ID/C Station
- Conflicts with existing DSTT structures

# *C-ID community concerns*

- ✓ Minimize construction impacts
- ✓ Improve intermodal connections
- ✓ Activate Union Station

# *Construction constraints*

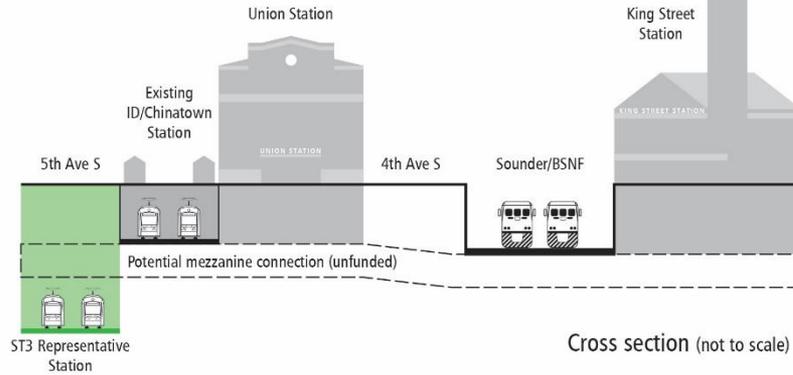
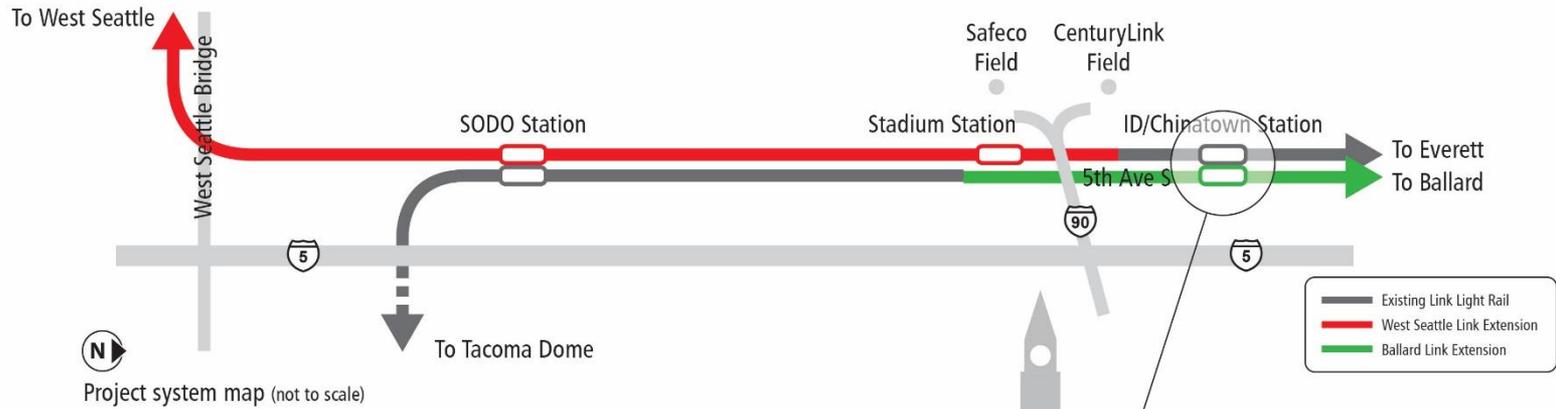
- ✓ Limited right-of-way
- ✓ Poor soil conditions
- ✓ Deep piles under 4th Ave, Union Station, ID/C Station
- ✓ Conflicts with existing DSTT structures



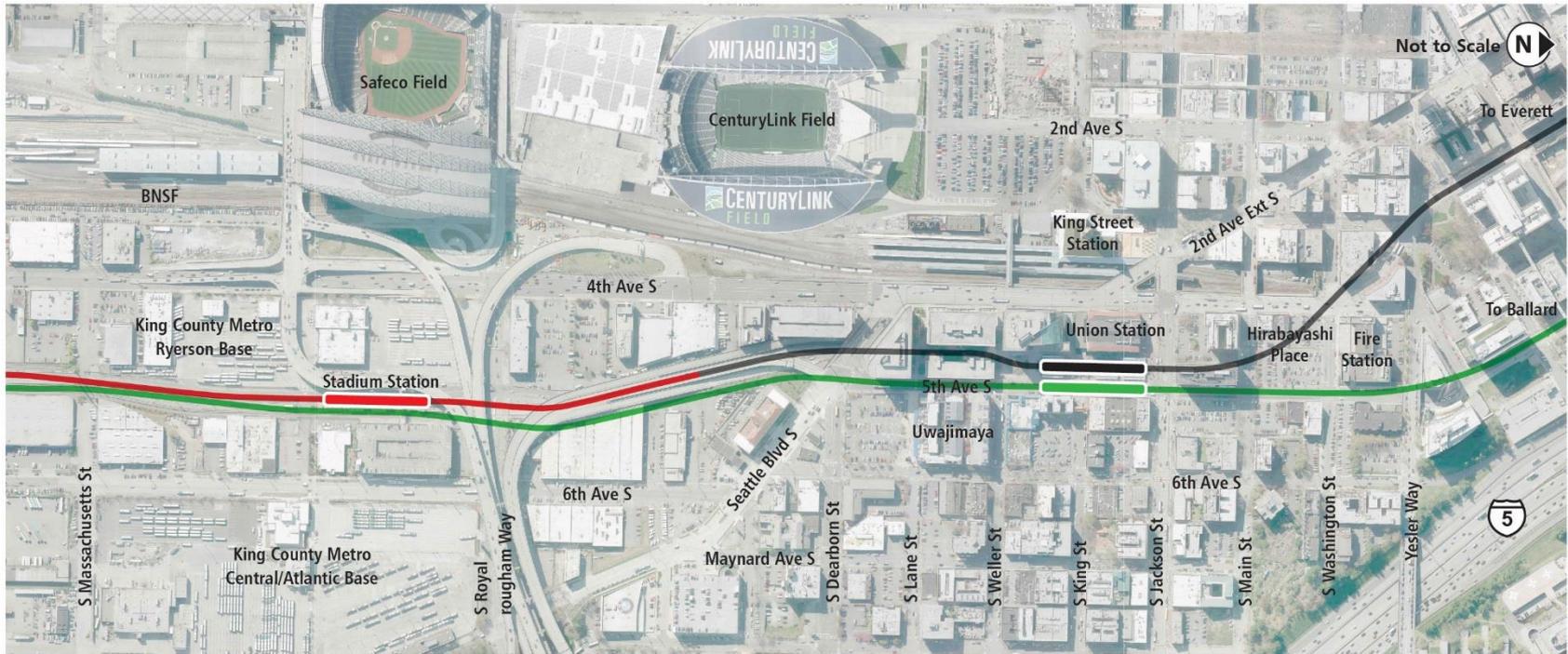
# New Chinatown-*ID* Level 1 Alternatives

# Potential C-ID Station Locations

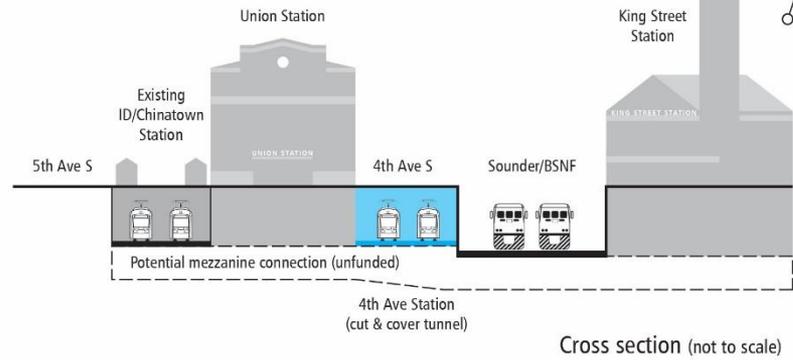
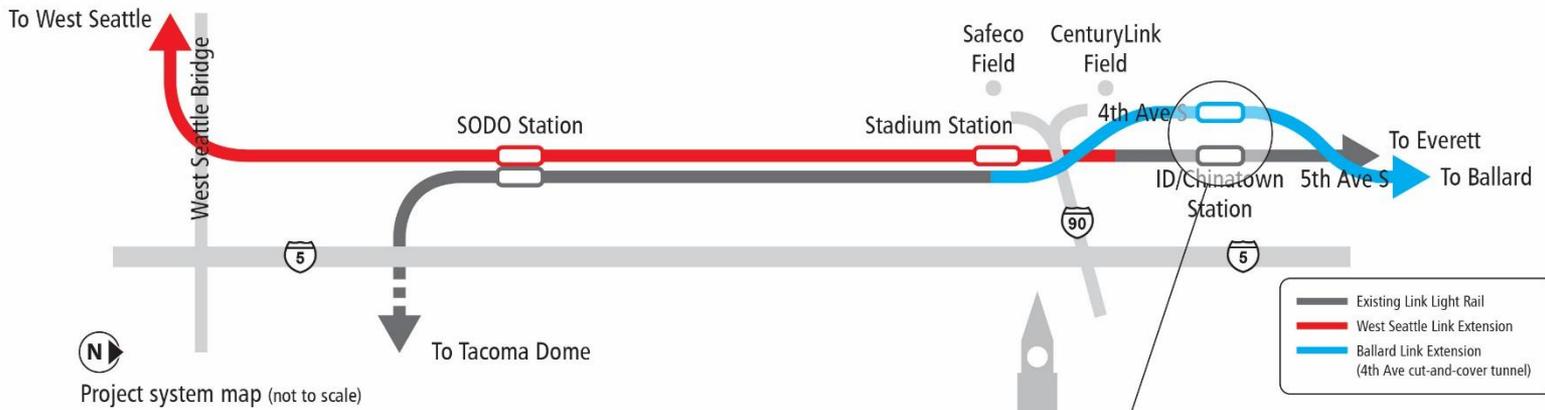
Tunnel / Station Type	5th Ave	4th Ave	Union Station
Cut-and-cover Platform depth:	✓ (40-50')	✓ (30-40')	✗
Bored / mined Platform depth:	✓ (100-120')	✓ (150-200')	✓ (150-200')



# C-ID Station at 5<sup>th</sup> Ave S

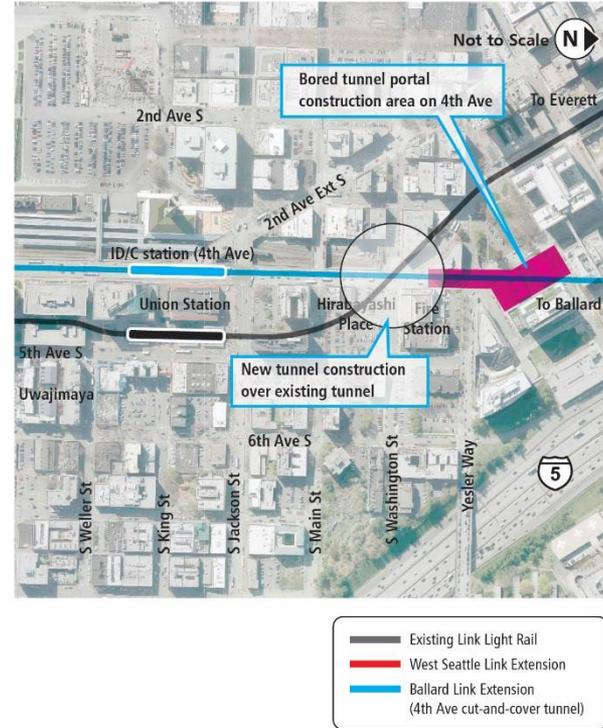
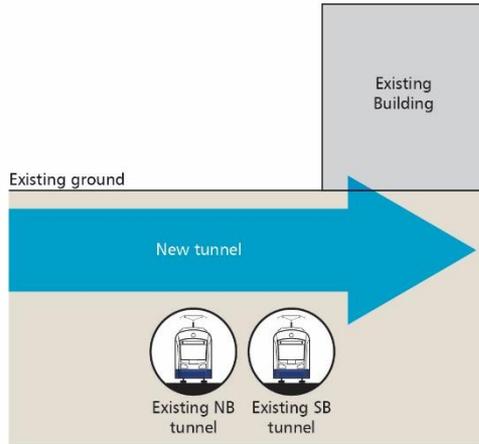


# C-ID Station at 5<sup>th</sup> Ave S



# C-ID Station at 4<sup>th</sup> Ave S Cut-and-cover





# C-ID Station at 4<sup>th</sup> Ave S Cut-and-cover

CenturyLink Field

2nd Ave S

Not to Scale



Potential traffic detours during construction

CENTURYLINK FIELD

King Street Station

2nd Ave Ext S

4th Ave S

4th Ave S

33,000 Average Daily Traffic

Union Station

Hirabayashi Place

Fire Station

5th Ave S

8,500 Average Daily Traffic

5th Ave S

Terrace St

Seattle Blvd S

S Dearborn St

Uwajimaya

S Lane St

6th Ave S

S Weller St

S King St

S Jackson St

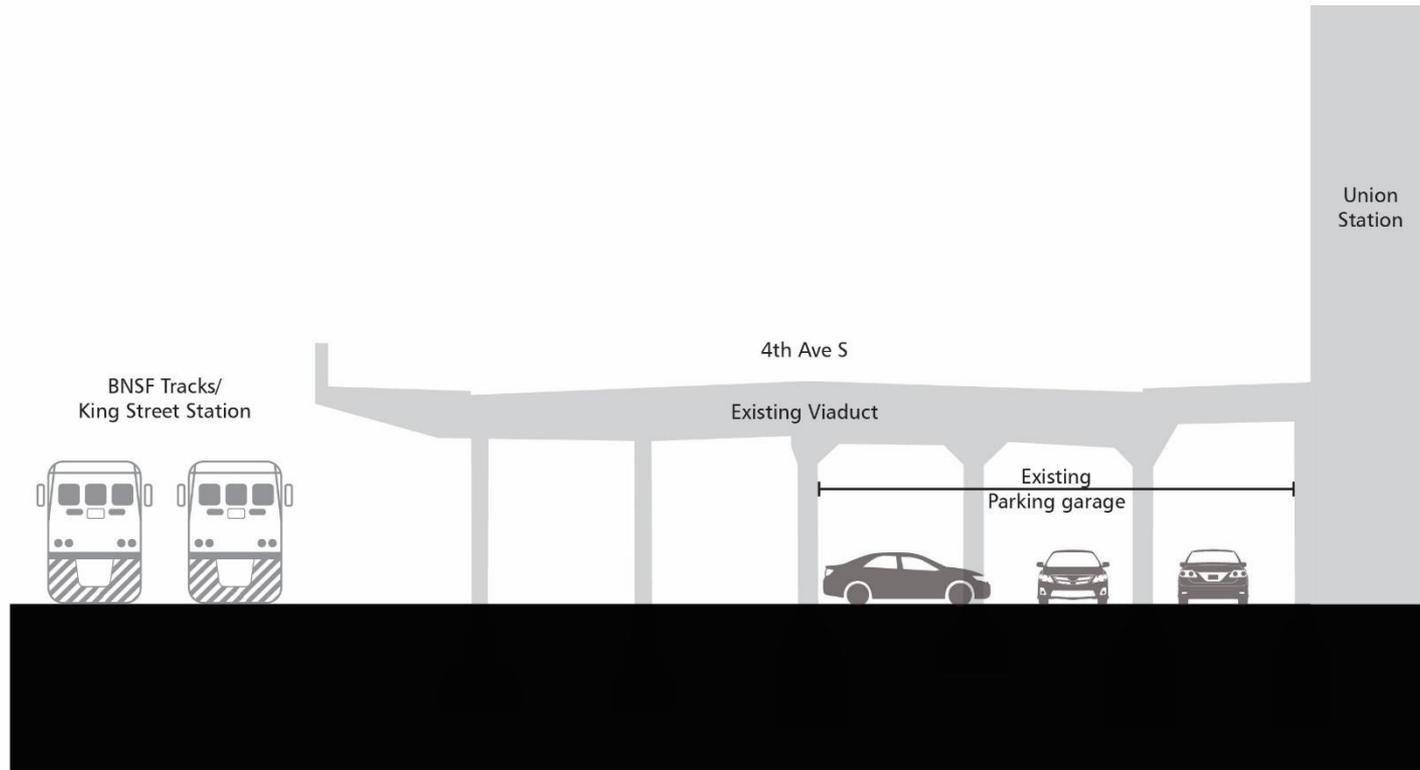
S Main St

S Washington St

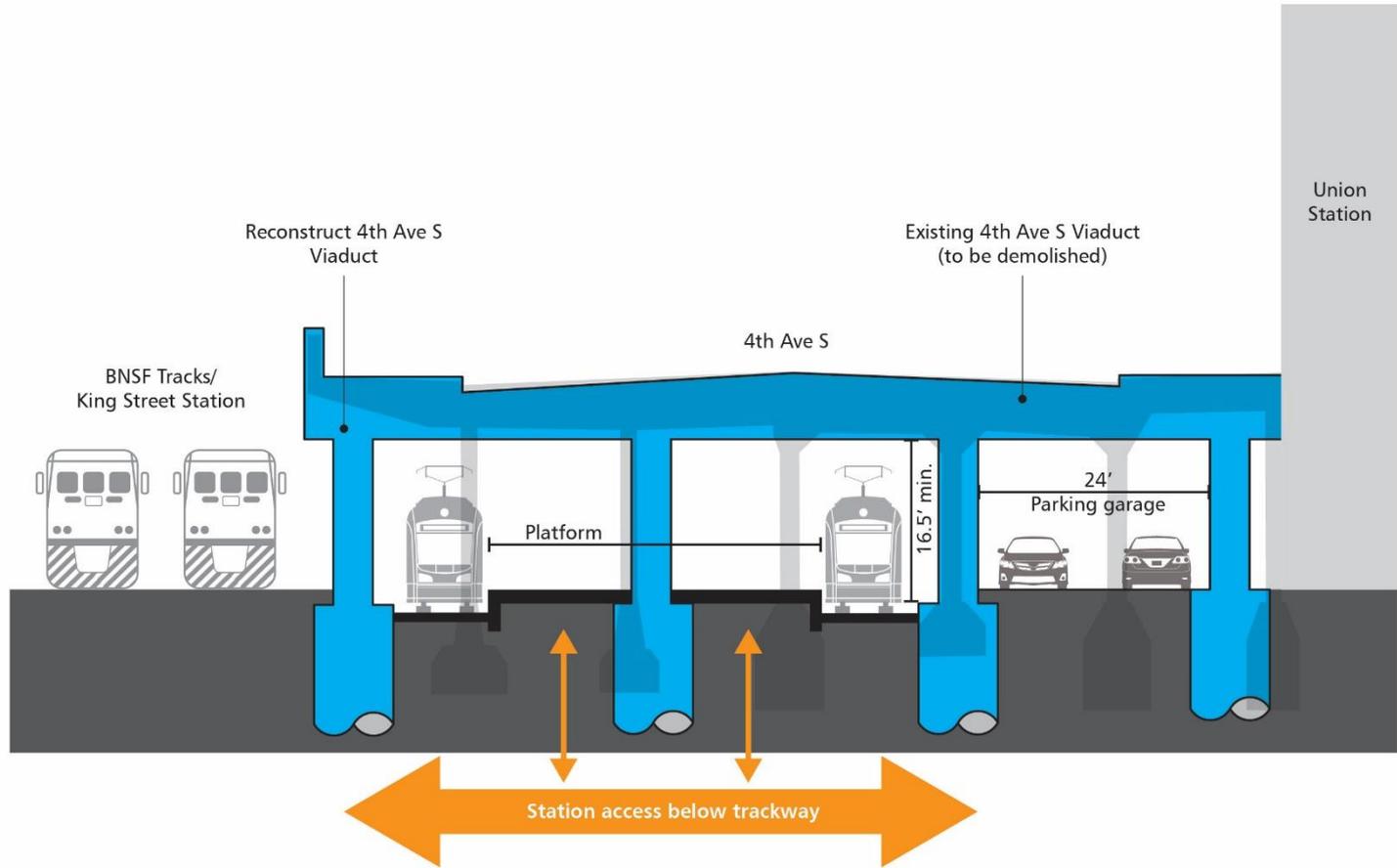
Yesler Way



Construction impacts/traffic diversion



**4<sup>th</sup> Ave Viaduct – section looking north**

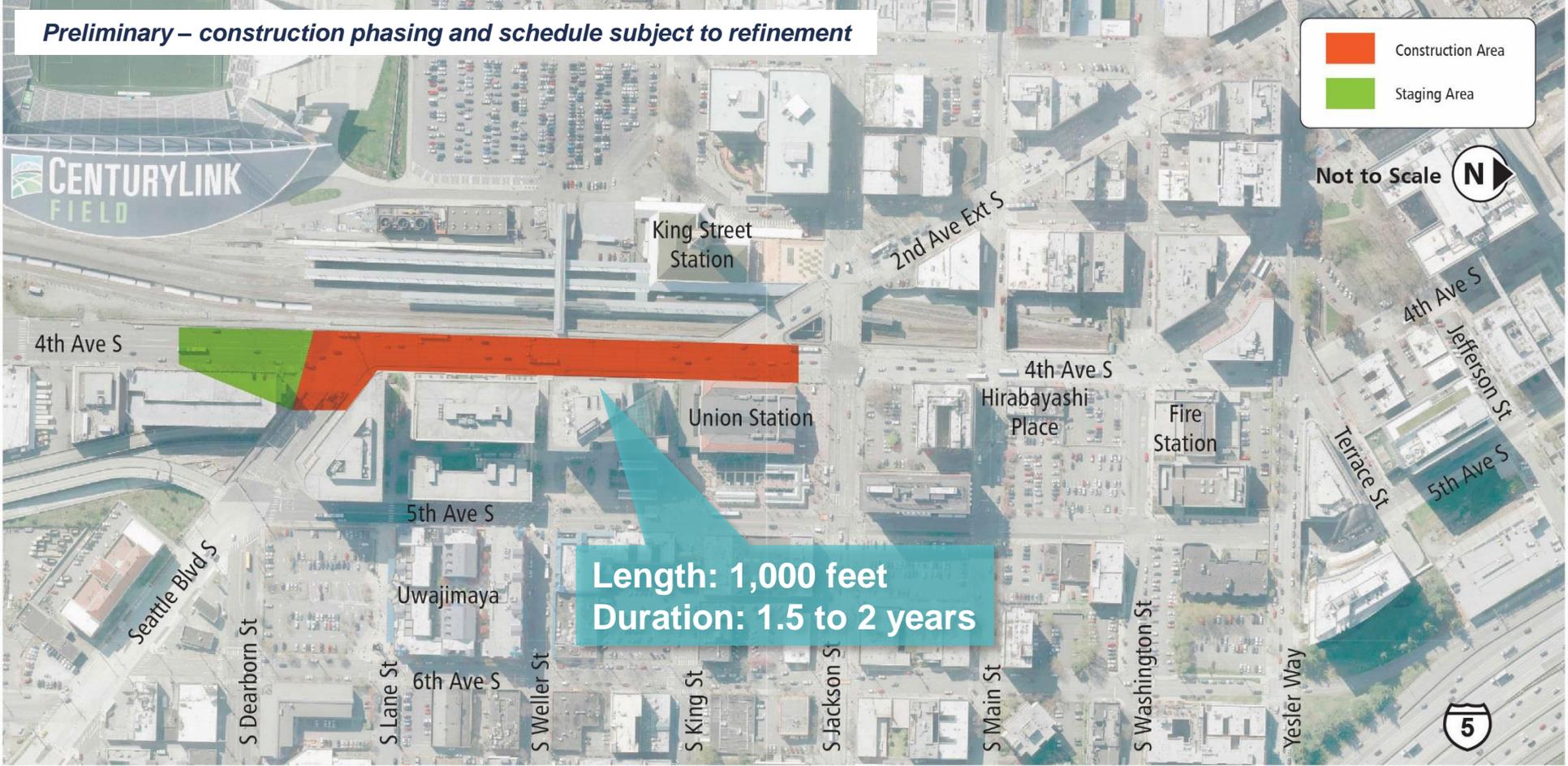


# 4<sup>th</sup> Ave Viaduct Rebuild – section looking north

**Preliminary – construction phasing and schedule subject to refinement**

Construction Area  
Staging Area

Not to Scale 



**Length: 1,000 feet  
Duration: 1.5 to 2 years**

# 4<sup>th</sup> Ave Cut-and-Cover construction Phase 1

Preliminary – construction phasing and schedule subject to refinement

Construction Area

Staging Area

Station construction begins

Not to Scale

4th Ave S

COMPLETED

King Street Station

2nd Ave Ext S

4th Ave S

Jefferson St

Union Station

Hirabayashi Place

Fire Station

Terrace St

5th Ave S

5th Ave S

Length: 600 feet  
Duration: 1.25 to 1.5 years

Seattle Blvd S

Uwajimaya

S Dearborn St

S Lane St

6th Ave S

S Weller St

S King St

S Jackson St

S Main St

S Washington St

Yesler Way



# 4<sup>th</sup> Ave Cut-and-Cover construction Phase 2

Preliminary – construction phasing and schedule subject to refinement

Construction Area

Staging Area

Station construction continues

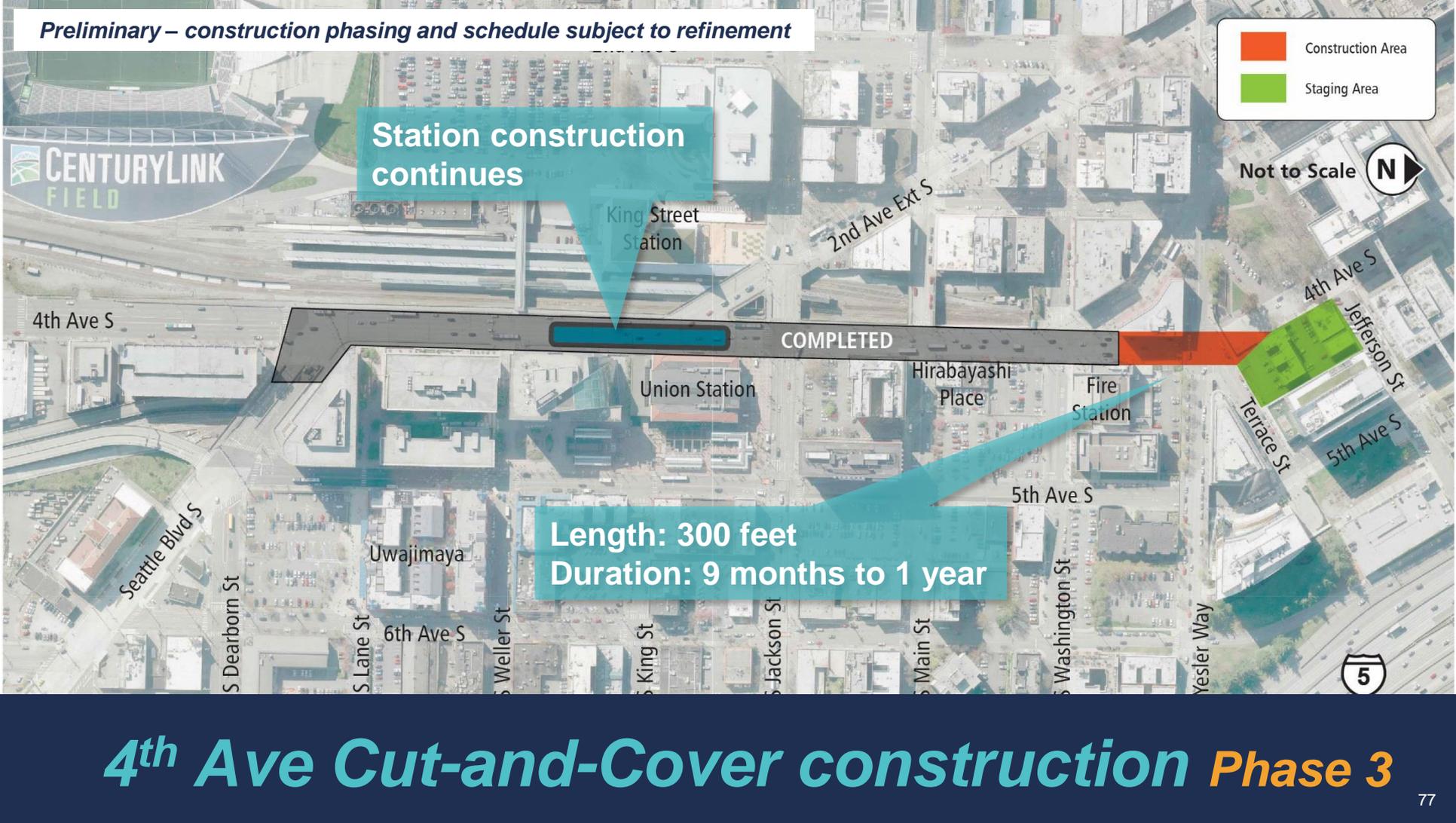
Not to Scale

4th Ave S

COMPLETED

Length: 300 feet  
Duration: 9 months to 1 year

# 4<sup>th</sup> Ave Cut-and-Cover construction Phase 3



Preliminary – construction phasing and schedule subject to refinement

Not to Scale



Station construction continues  
(1 year)

King Street  
Station

2nd Ave Ext S

4th Ave S

Jefferson St

4th Ave S

COMPLETED

Union Station

Hirabayashi  
Place

Fire  
Station

5th Ave S

Terrace St

5th Ave S

Seattle Blvd S

Uwajimaya

Total construction  
duration: 4.5 to 5.5 years

S Dearborn St

S Lane St

6th Ave S

S Weller St

S King St

S Jackson St

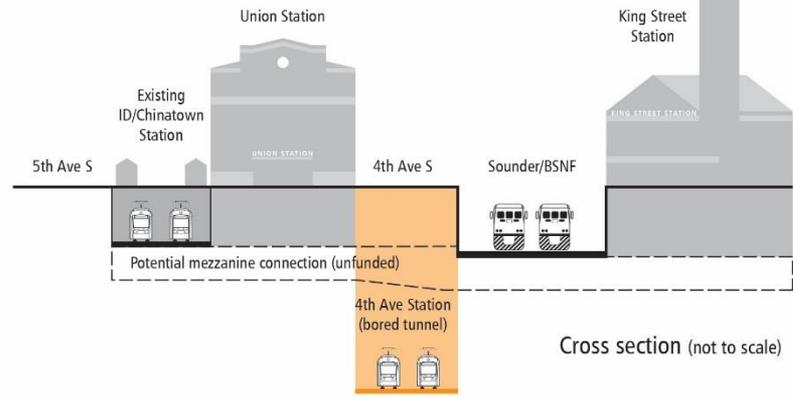
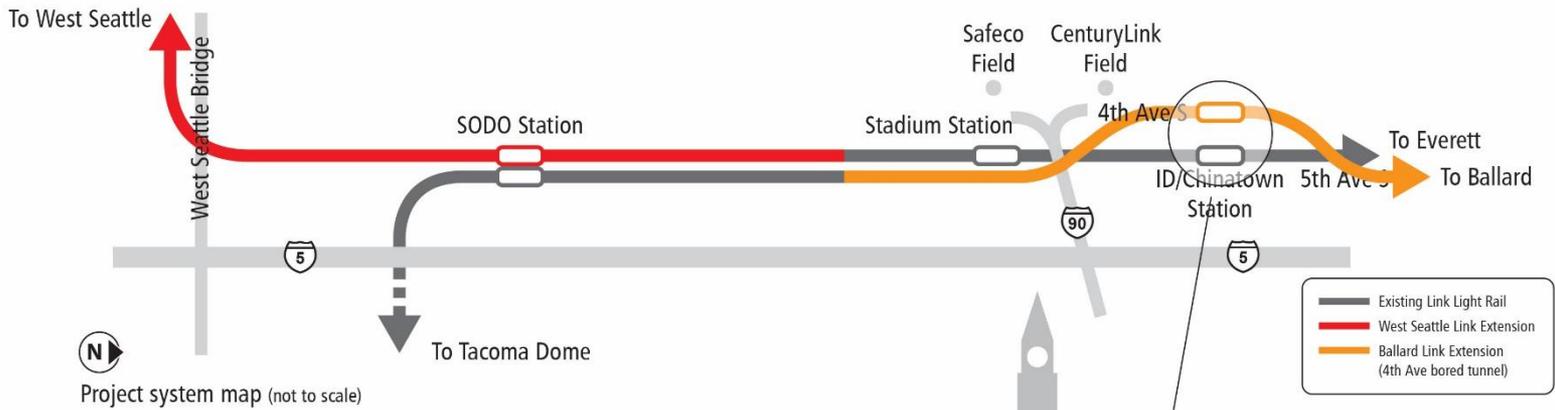
S Main St

S Washington St

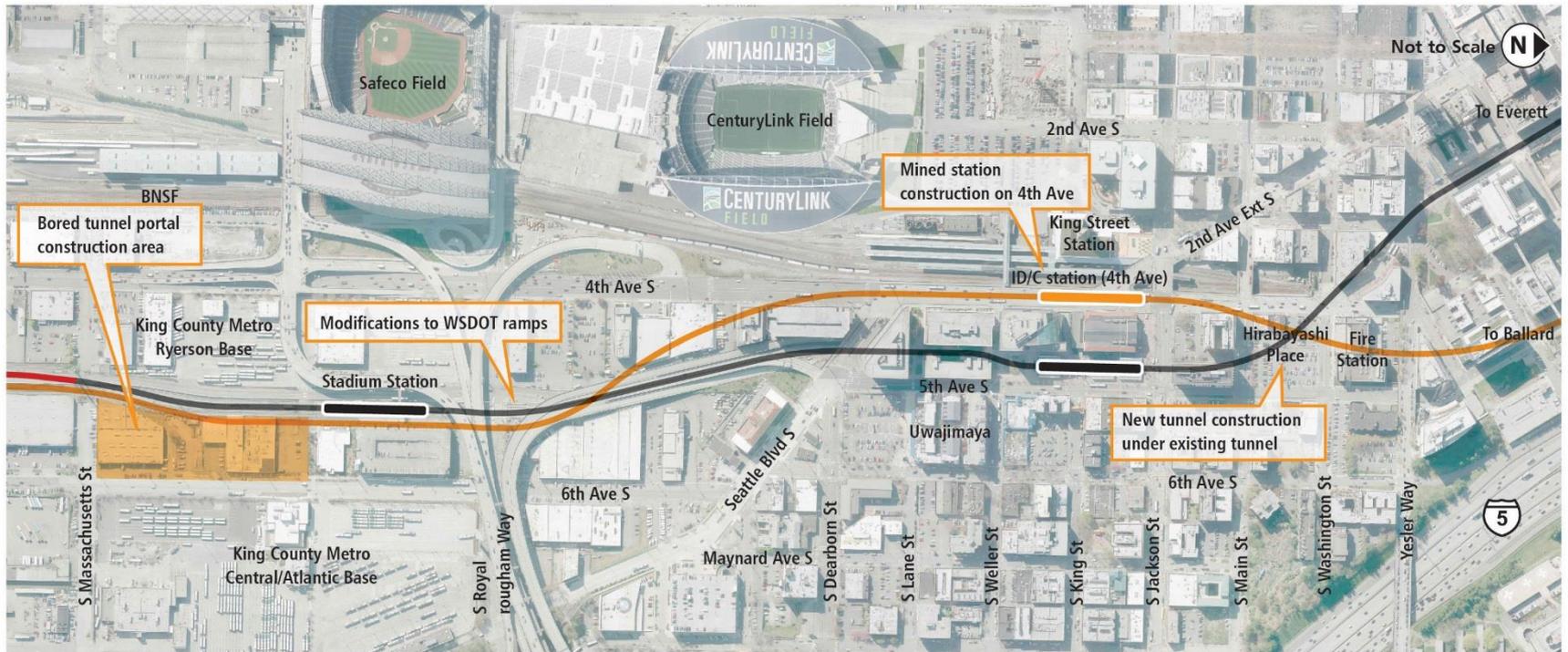
S Yesler St



# 4<sup>th</sup> Ave Cut-and-Cover construction Phase 4



# C-ID Station at 4<sup>th</sup> Ave S Bored tunnel



Not to Scale 

Bored tunnel portal construction area

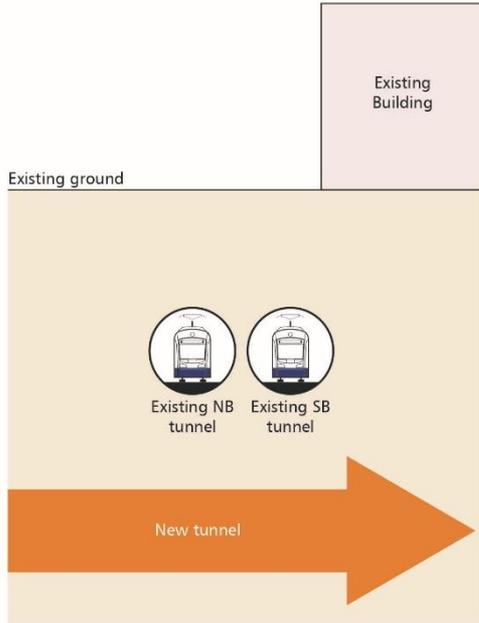
Mined station construction on 4th Ave

Modifications to WSDOT ramps

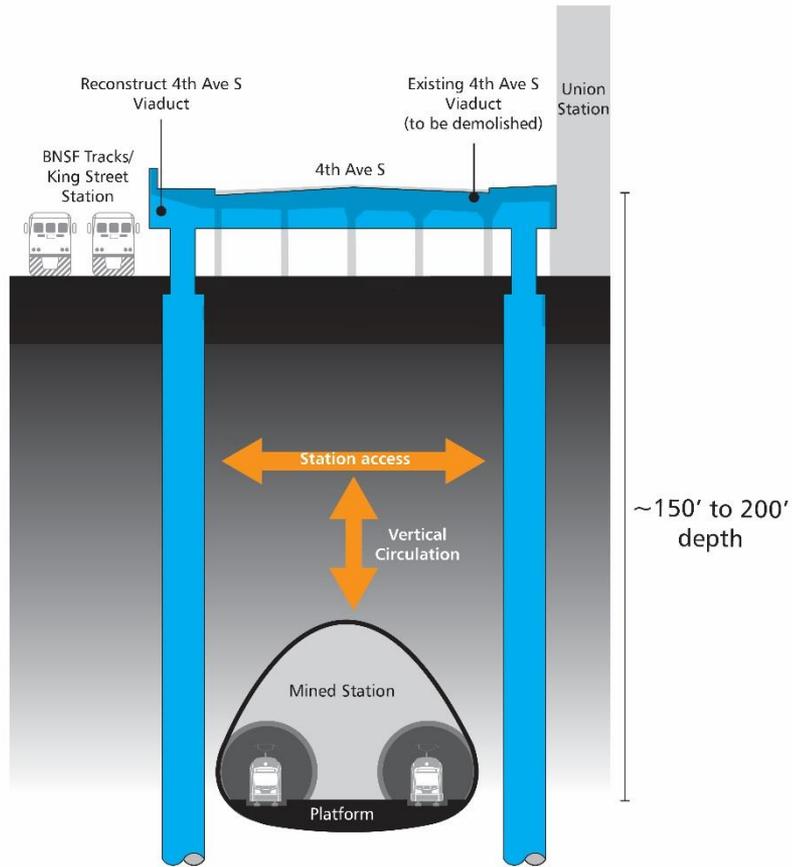
New tunnel construction under existing tunnel

-  Existing Link Light Rail
-  West Seattle Link Extension
-  Ballard Link Extension (4th Ave bored tunnel)

# C-ID Station at 4<sup>th</sup> Ave S *Bored tunnel*



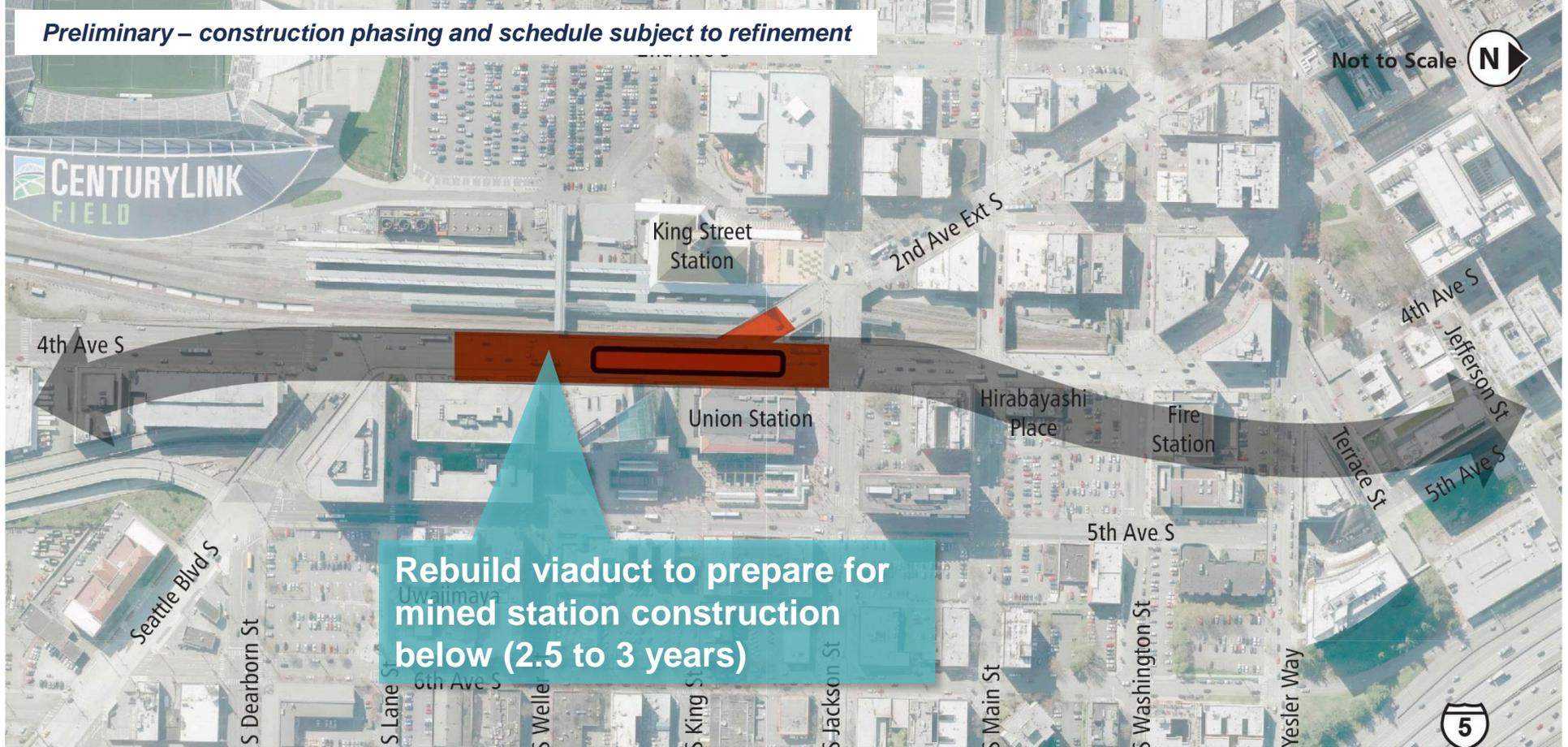
# C-ID Station at 4<sup>th</sup> Ave S Bored tunnel



# 4<sup>th</sup> Ave Bored Tunnel Mined Station Construction

Preliminary – construction phasing and schedule subject to refinement

Not to Scale



Rebuild viaduct to prepare for mined station construction below (2.5 to 3 years)

# 4<sup>th</sup> Ave Bored Tunnel – Construction Phase 1

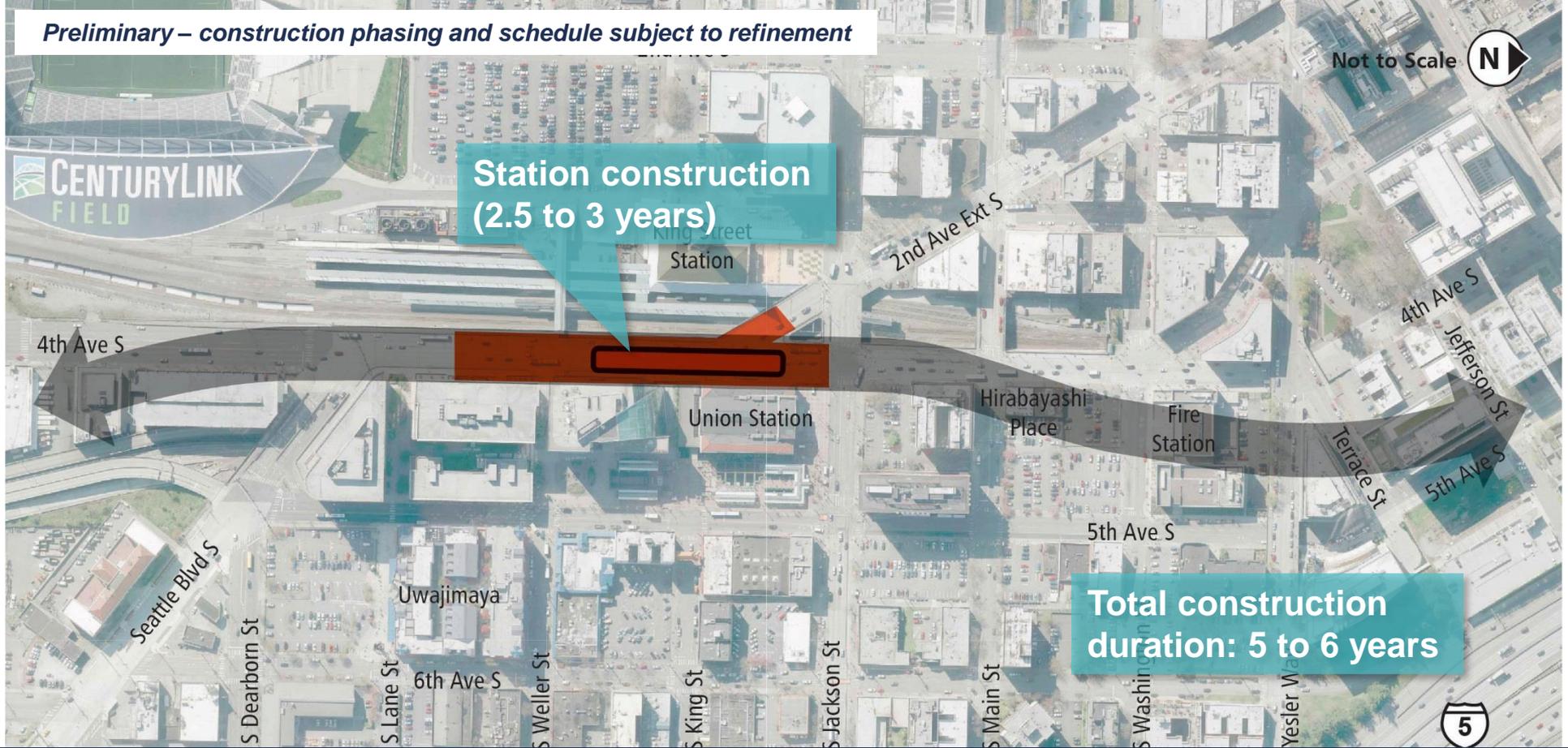
Preliminary – construction phasing and schedule subject to refinement

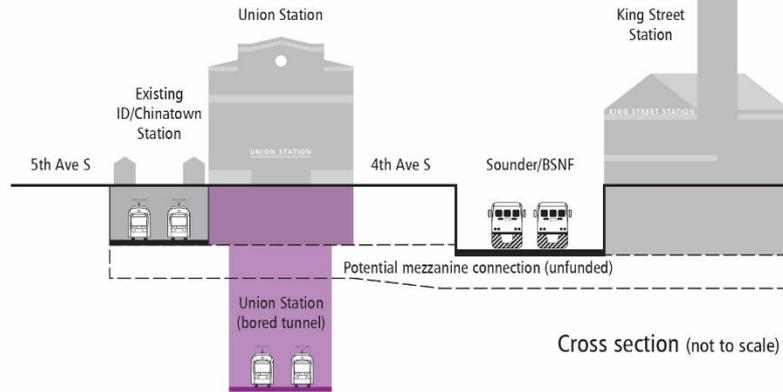
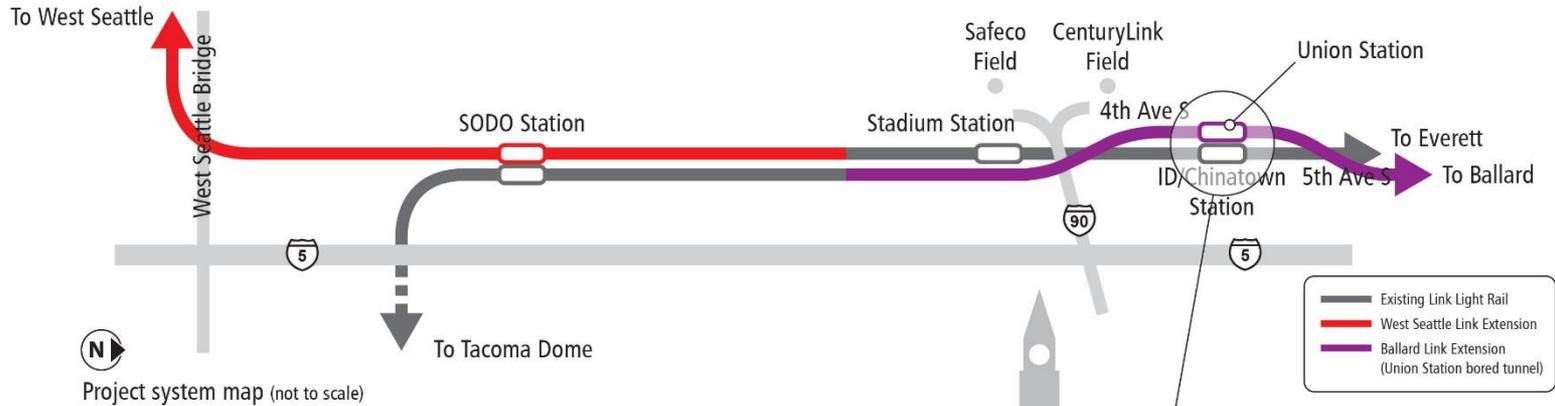
Not to Scale 

Station construction  
(2.5 to 3 years)

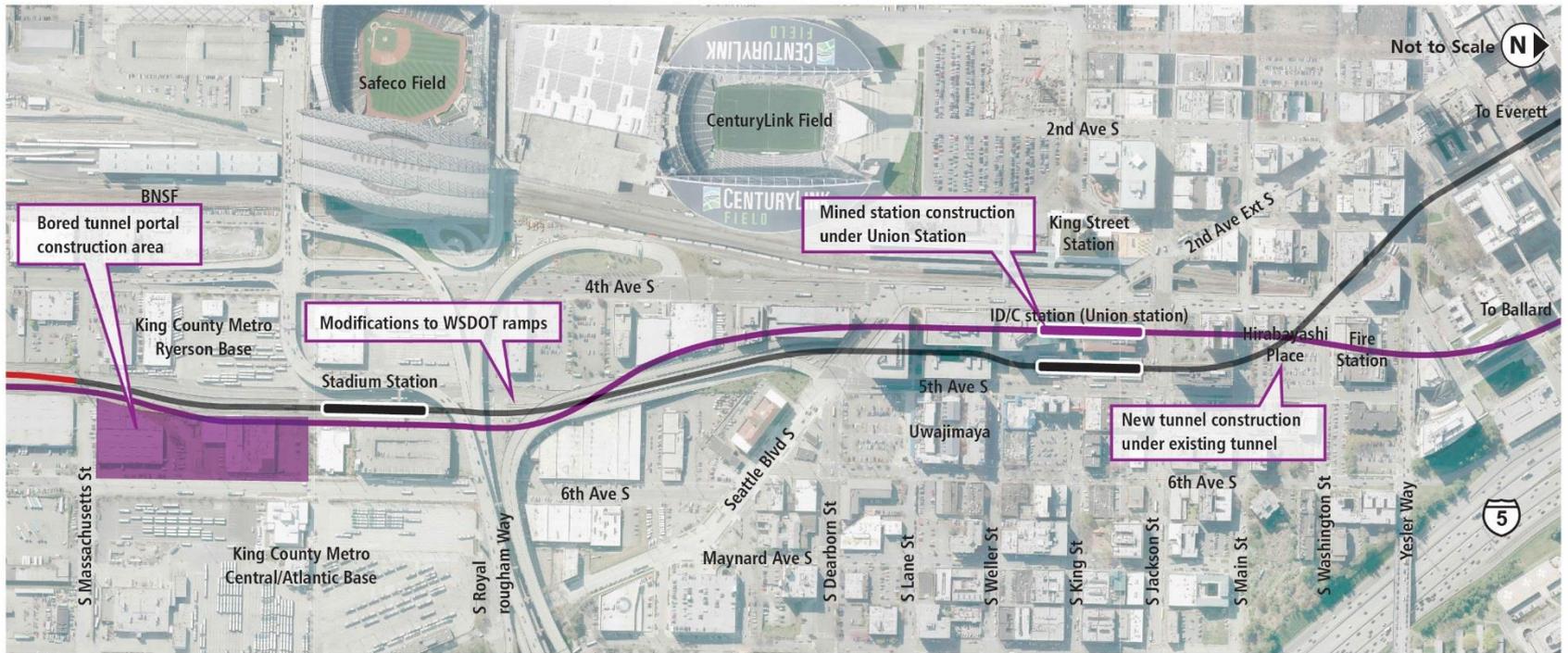
Total construction  
duration: 5 to 6 years

# 4<sup>th</sup> Ave Bored Tunnel – Construction Phase 2





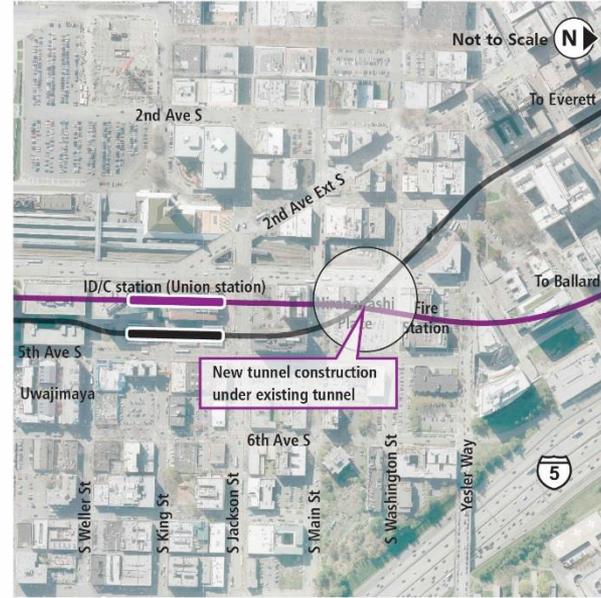
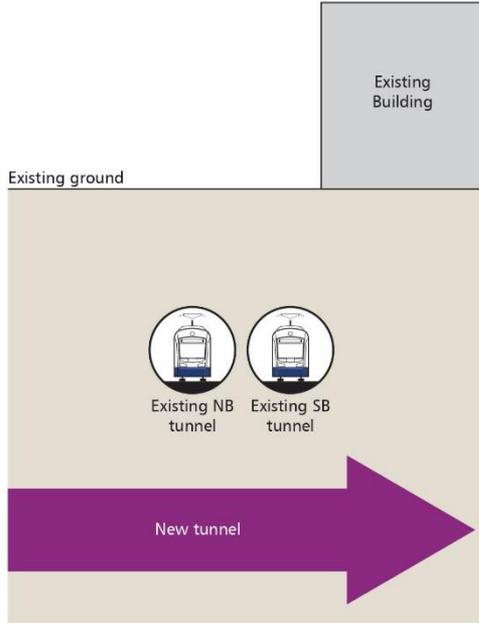
# C-ID Station under Union Station Bored tunnel



Not to Scale 

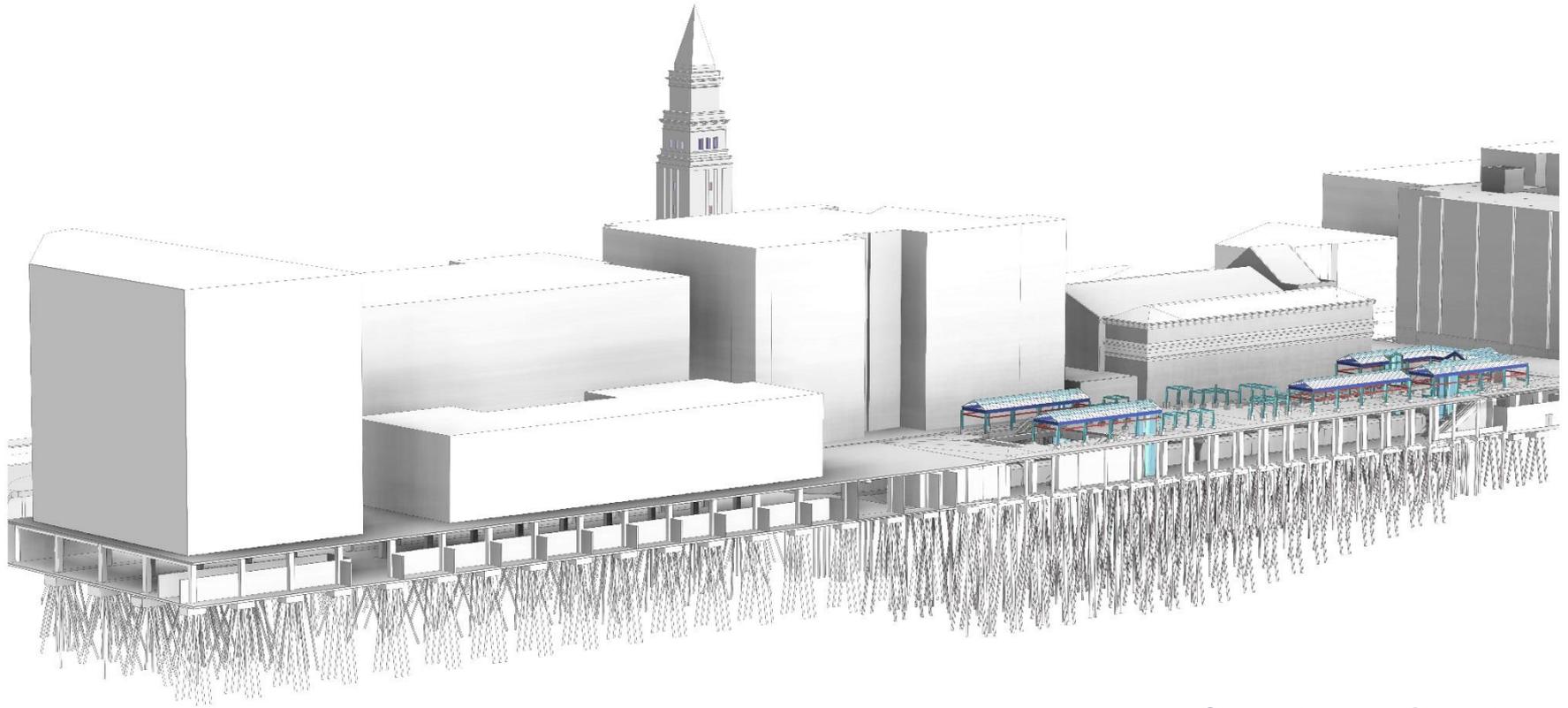
-  Existing Link Light Rail
-  West Seattle Link Extension
-  Ballard Link Extension (Union Station bored tunnel)

# C-ID Station under Union Station **Bored tunnel**



-  Existing Link Light Rail
-  West Seattle Link Extension
-  Ballard Link Extension (Union Station bored tunnel)

# C-ID Station under Union Station **Bored tunnel**



*Conceptual drawing not to scale.*

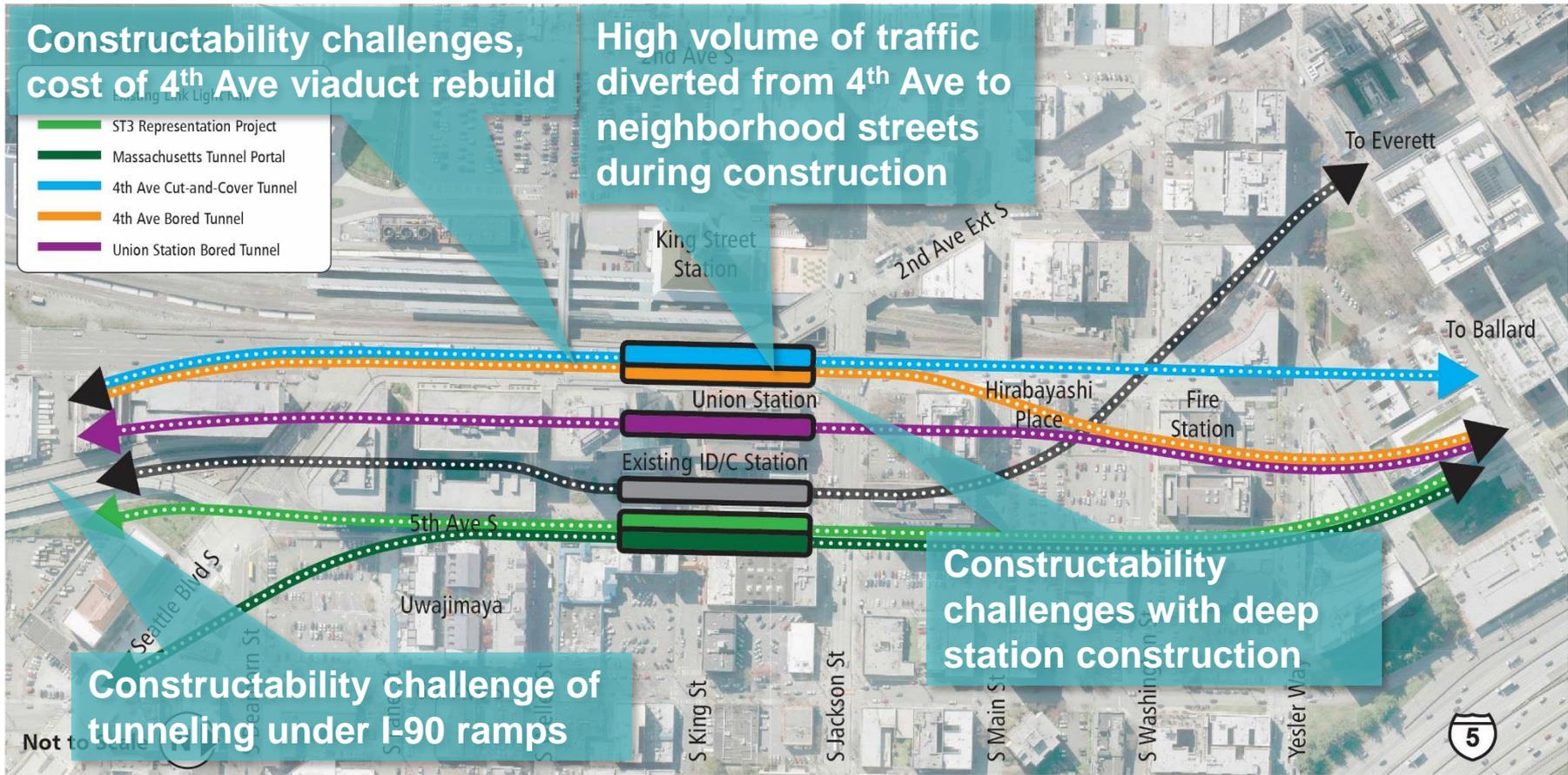
***Piles under Union Station/IDS complex***



# Constructability challenges, cost of 4th Ave viaduct rebuild

- ST3 Representation Project
- Massachusetts Tunnel Portal
- 4th Ave Cut-and-Cover Tunnel
- 4th Ave Bored Tunnel
- Union Station Bored Tunnel

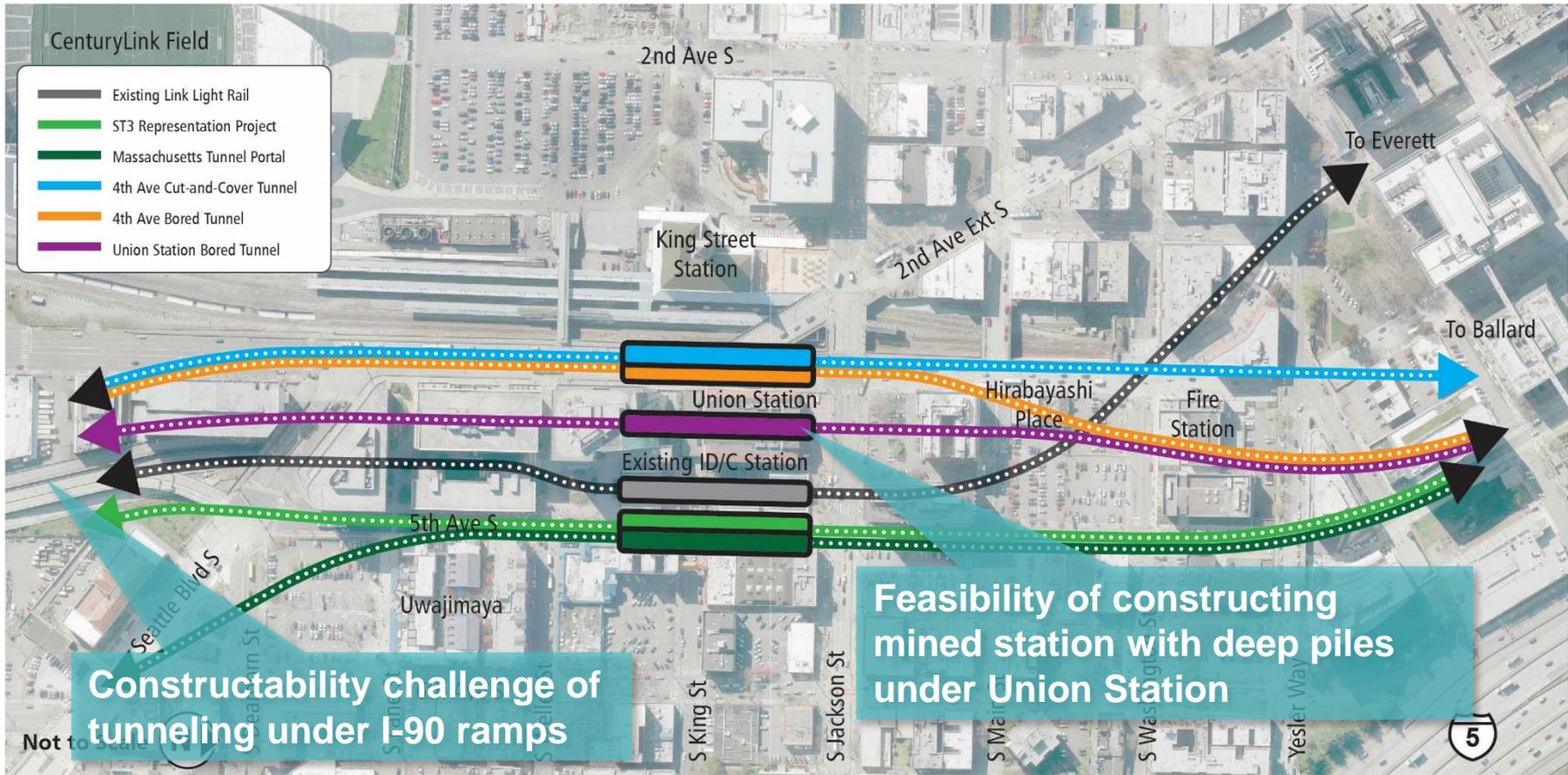
High volume of traffic diverted from 4th Ave to neighborhood streets during construction



Constructability challenge of tunneling under I-90 ramps

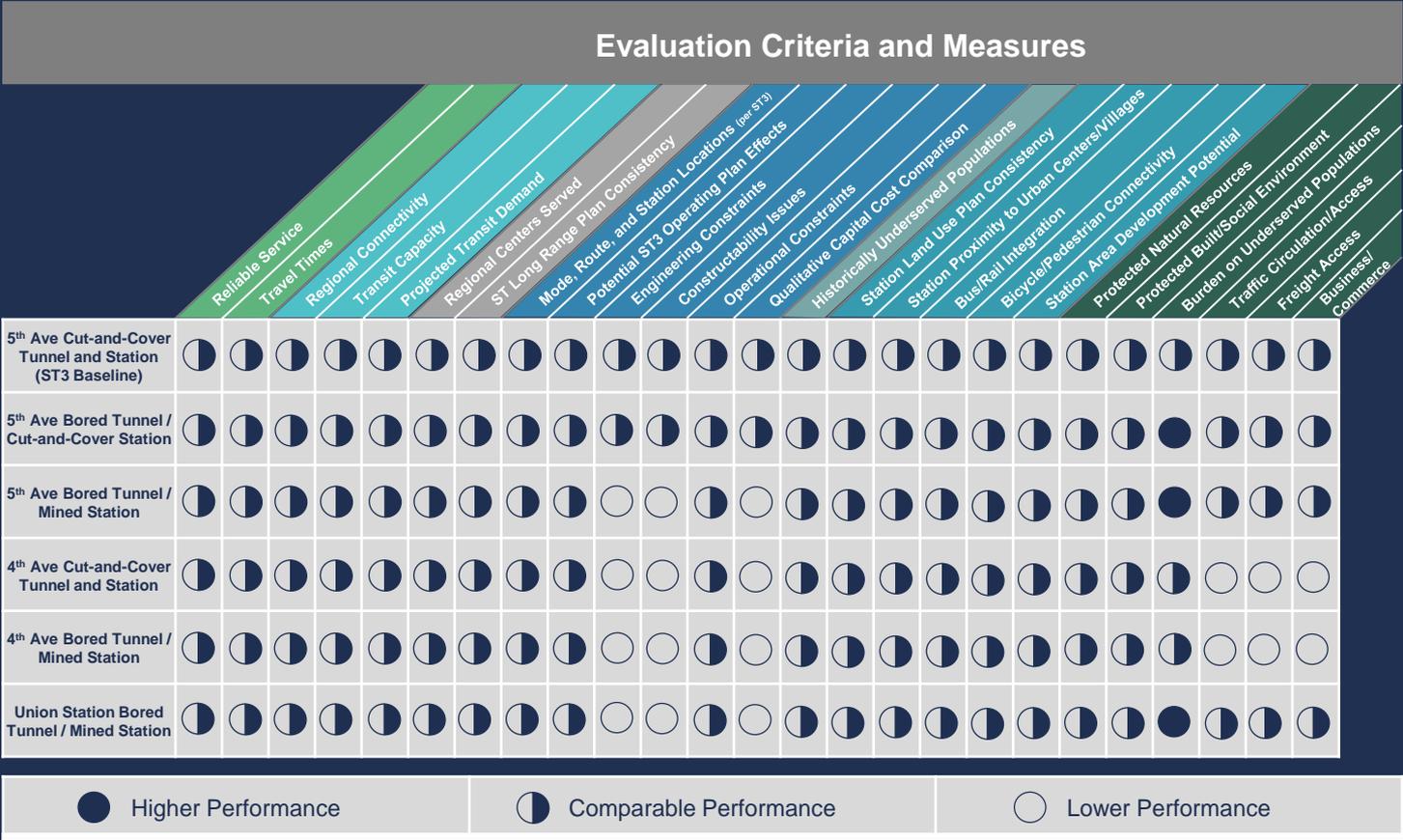
Constructability challenges with deep station construction

# 4th Ave Bored Tunnel – Key Findings



# Union Station Bored Tunnel – Key Findings

# C-ID Level 1 Alternatives – Evaluation Results



# C-ID Level 1 Alternatives – Evaluation Results

## Evaluation Criteria and Measures

Complex engineering, difficult and higher cost construction associated with deep mined stations, 4<sup>th</sup> Avenue viaduct rebuild

Closer proximity to Sounder, but less convenient LRT transfers

	Reliable Service	Travel Times	Regional Connectivity	Transit Capacity	Projected Transit Demand	Regional Centers Served	ST Long Range Plan Consistency	Mode, Route, and Station Locations (per ST3)	Potential ST3 Operating Plan Effects	Engineering Constraints	Constructability Issues	Operational Constraints	Qualitative Capital Cost Comparison	Station Land Use Plan Consistency	Station Proximity to Urban Centers/Villages	Bus/Rail Integration	Bicycle/Pedestrian Connectivity	Station Area Development Potential	Protected Natural Resources	Burden on Underserved Populations	Traffic Circulation/Access	Freight Access/Commerce
5 <sup>th</sup> Ave Cut-and-Cover Tunnel and Station (ST3 Baseline)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
5 <sup>th</sup> Ave Bored Tunnel / Cut-and-Cover Station	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
5 <sup>th</sup> Ave Bored Tunnel / Mined Station	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
4 <sup>th</sup> Ave Cut-and-Cover Tunnel and Station	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
4 <sup>th</sup> Ave Bored Tunnel / Mined Station	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Union Station Bored Tunnel / Mined Station	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

Reduced construction impacts offset by 4<sup>th</sup> Ave traffic detour impacts

Detours from 4<sup>th</sup> Avenue during construction affect traffic, freight

Feasibility of mined station construction under historic building with deep piles

Performance



Comparable Performance



Lower Performance

# Chinatown-ID Alternatives Summary – Level 1

Alternatives with more potential	5 <sup>th</sup> Ave Cut-and-Cover Tunnel and Station (ST3/Baseline) 	<ul style="list-style-type: none"> <li>• Baseline for comparison</li> </ul>
	5 <sup>th</sup> Ave Bored Tunnel / Cut-and-Cover Station 	<ul style="list-style-type: none"> <li>• Reduces extent of cut-and-cover construction impacts</li> <li>• Moved forward to Level 2</li> </ul>
Alternatives with greater challenges	5 <sup>th</sup> Ave Bored Tunnel / Mined Station 	<ul style="list-style-type: none"> <li>• Reduces extent of cut-and-cover construction impacts</li> <li>• Deep mined station construction technically challenging (platform 100 – 120’ deep)</li> </ul>
	4 <sup>th</sup> Ave Cut-and-Cover Tunnel and Station 	<ul style="list-style-type: none"> <li>• 4<sup>th</sup> Ave viaduct rebuild; potential major traffic, freight, and transit mobility impacts</li> <li>• Construction detours could impact neighborhood streets</li> <li>• 4<sup>th</sup> Ave viaduct rebuild; requires third party funding</li> <li>• LRT service disruptions during construction over existing tunnel</li> <li>• Constructability challenge of tunneling under I-90 ramps</li> </ul>
	4 <sup>th</sup> Ave Bored Tunnel / Mined Station 	<ul style="list-style-type: none"> <li>• 4<sup>th</sup> Ave viaduct rebuild (at station); potential traffic, freight, and transit mobility impacts</li> <li>• Construction detours could impact neighborhood streets</li> <li>• Deep mined station construction under 4<sup>th</sup> Ave (platform 150 – 200’ deep)</li> <li>• Property impacts of TBM portal site in E-3 busway</li> </ul>
Not practical concept	Union Station Bored Tunnel / Mined Station 	<ul style="list-style-type: none"> <li>• Deep piles under Union Station, existing ID Station and adjacent buildings require deep mined station (platform 150 - 200’ deep)</li> <li>• Deep station precludes easy ped connections to IDS and King St. stations</li> <li>• Risk of settlement damage to landmark US building</li> <li>• Lacks construction staging and access shaft sites</li> </ul>



# *Equity and Inclusion*

# *New approach to project development*

- Enhance commitment to partnership, community engagement, collaboration, transparency and accountability
- Apply innovative ideas and lessons learned to streamline project delivery
- Enhance access to the system and develop an equitable regional TOD strategy



# *Equity and the environmental process*

During environmental review, Sound Transit conducts an **environmental justice analysis** in compliance with federal regulations.

- **Executive Order 12898:** Federal Actions to Address Environmental Justice to Minority Populations and Low-Income Populations (1994)
- **USDOT Order 5610.2:** Actions to Address Environmental Justice (1997) and 2012 Update
- FTA environmental justice policy guidance, FTA Circular

# *Partnership with the City of Seattle*

Partnering agreement provides framework for Sound Transit and the City to ***work closely together*** during the alternatives development phase of the project to ***identify a preferred alternative*** as well as other alternatives to study in the EIS.



# Mayor Durkan Executive Order

- › An Executive Order affirming the City of Seattle's commitment to the ***Race and Social Justice Initiative (RSJI)***.
- › The RSJI vision is to ***achieve racial equity*** in the community and the mission is to ***end institutional and structural racism*** in City government, ***promoting inclusion*** and full participation of all residents, and ***partnering with the community*** to achieve racial equity across Seattle.



## Racial Equity Toolkit

to Assess Policies, Initiatives, Programs, and Budget Issues



The vision of the Seattle Race and Social Justice Initiative is to eliminate racial inequity in the community. To do this requires ending *individual racism*, *institutional racism* and *structural racism*. The Racial Equity Toolkit lays out a process and a set of questions to guide the development, implementation and evaluation of policies, initiatives, programs, and budget issues to address the impacts on racial equity.

### **When Do I Use This Toolkit?**

Early. Apply the toolkit early for alignment with departmental racial equity goals and desired outcomes.

### **How Do I Use This Toolkit?**

With Inclusion. The analysis should be completed by people with different racial perspectives.

Step by step. The Racial Equity Analysis is made up of six steps from beginning to completion:

#### **Step 1. Set Outcomes.**

Leadership communicates key community outcomes for racial equity to guide analysis.

#### **Step 2. Involve Stakeholders + Analyze Data.**

Gather information from community and staff on how the issue benefits or burdens the community in terms of racial equity.

#### **Step 3. Determine Benefit and/or Burden.**

Analyze issue for impacts and alignment with racial equity outcomes.

#### **Step 4. Advance Opportunity or Minimize Harm.**

Develop strategies to create greater racial equity or minimize unintended consequences.

#### **Step 5. Evaluate. Raise Racial Awareness. Be Accountable.**

Track impacts on communities of color overtime. Continue to communicate with and involve stakeholders. Document unresolved issues.

#### **Step 6. Report Back.**

Share information learned from analysis and unresolved issue with Department Leadership and Change Team.

# What is a Racial Equity Toolkit (RET)?

- Assessment tool developed by City of Seattle to address impacts on racial equity.
- Data-driven and inclusive

# *West Seattle and Ballard Link Extensions*

## *RET process*

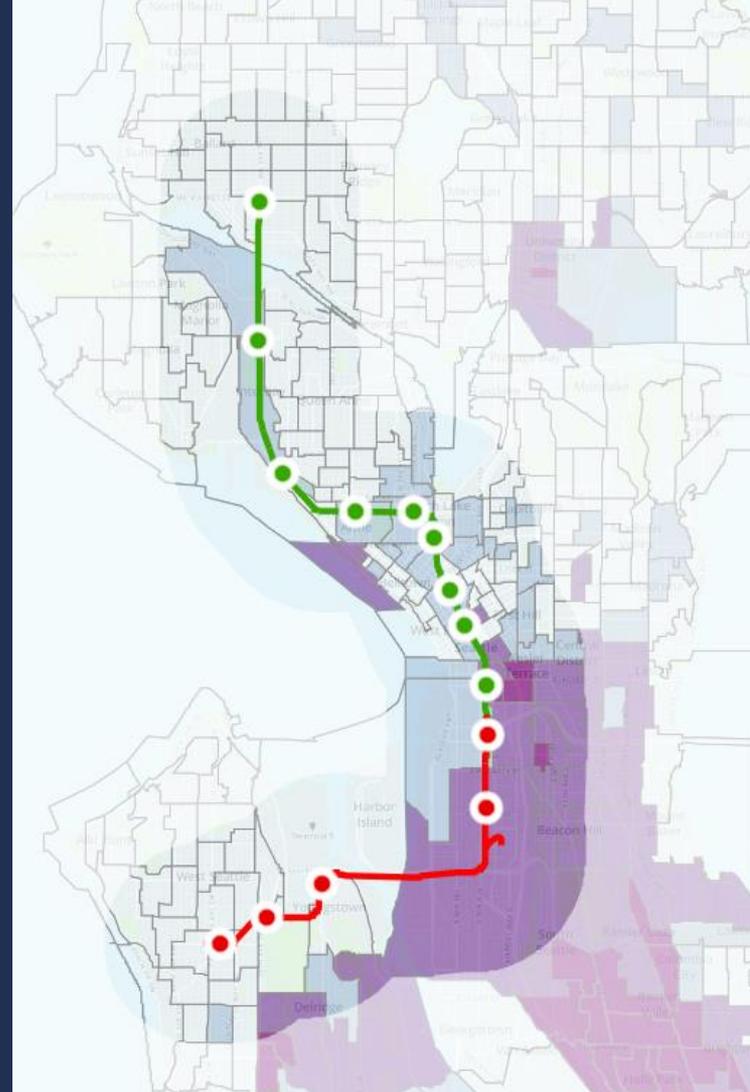
- › Sound Transit and City of Seattle RET collaborative team
- › Working group structure focused on engagement and data analysis
- › Conducted data analysis to determine focus areas

# Level 1 data findings

- › Mapped concentrations of communities of color in project corridor
- › **Chinatown/ID and Delridge Stations** emerged as station areas of focus for RET analysis

**Figure:** Concentrated communities of color (non-white population)

**Source:** 2011-2016 American Community Survey, projected in ArcGIS Online *WSBLE Community Conditions Basemap*

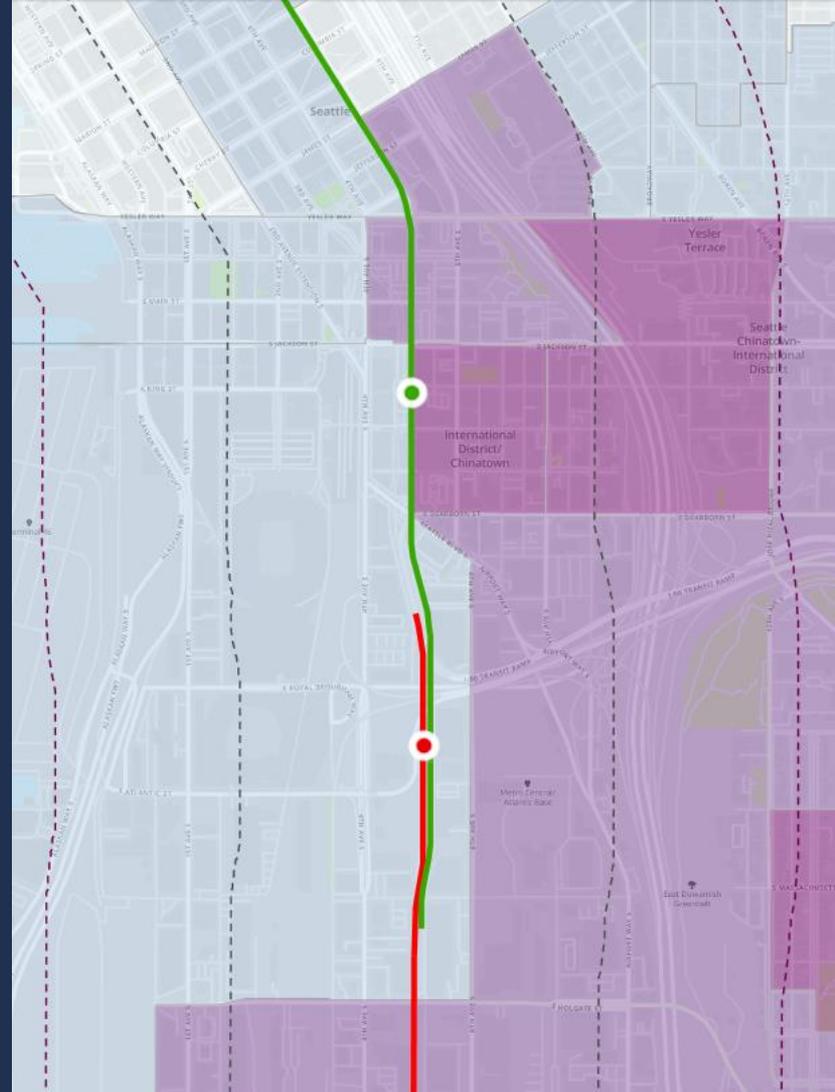


# Level 1 data findings

- Chinatown/International District station area is the only station area ***densely populated by communities of color*** in the WSBLE project corridor

**Figure 1:** Communities of Color in ½ mile catchment of C/ID and South Downtown

**Source:** 2011-2016 American Community Survey, projected in ArcGIS Online *WSBLE Community Conditions Basemap*

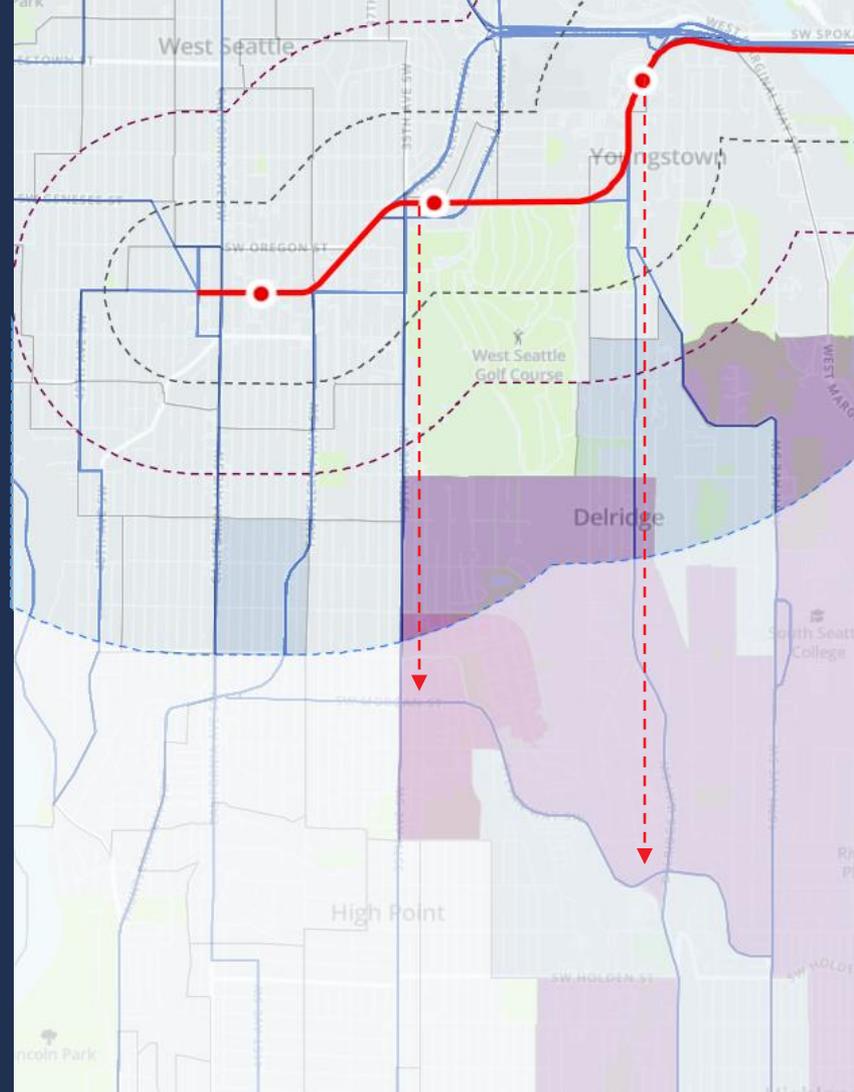


# Level 1 data findings

- › Densely populated communities of color lie **within the bike and transit sheds** of the Delridge and Avalon stations, but are **outside of those stations' immediate walksheds**

**Figure 2:** Communities of color beyond 1/2-mile catchment of Delridge and Avalon Stations and major bus routes

**Source:** 2011-2016 American Community Survey, projected in ArcGIS Online WSBLE Community Conditions Basemap)



# Level 1 data findings

- › Many stations in areas of **“high opportunity”**
- › **Correlation between race and class** where communities of color have lower incomes and access to opportunity than majority white communities

**Figure 3:** Opportunity Index (blue = higher score, brown = lower score;  
**Source:** City of Seattle, projected in ArcGIS Online WSBLE Community Conditions Basemap)



# How the RET has informed work so far

- › Established shared outcomes  
**(next slide)**
- › Collaboration on Chinatown-  
International District engagement  
and alternatives development
- › Social service provider interviews  
centering race
- › Modifications to screening criteria
- › Delridge station charrette  
collaboration



# *How the RET has informed work so far*

## › Shared outcomes

- ***Enhance mobility and access*** to create opportunity for communities of color and low-income populations.
- Create opportunities for ***equitable development*** that benefit communities of color.
- ***Avoid disproportionate adverse impacts*** on communities of color and for low-income populations.
- ***Meaningful involvement*** with communities of color and low-income populations.

# Looking ahead in Level 2

- › Collaboration will continue to elevate issues and considerations to ***better inform the alternatives development process.***
- › Strive to ***provide information*** that data alone cannot provide.
- › ***Sharing findings*** of Level 2 data analysis and community engagement.

## WHO IS SOUND TRANSIT?

We plan, build and operate regional transit systems and services to improve mobility in urban areas of King, Pierce and Snohomish counties.



### Sounder commuter rail

Sounder commuter rail provides a fast, reliable, and scenic mode of public transit between major employment and shopping centers in North Seattle, Everett, Tacoma, and Olympia. Sounder rail provides an essential transit link for commuters and is a key element of the region's transportation infrastructure.



### Link light rail

Link light rail provides a fast, reliable, and scenic mode of public transit between major employment and shopping centers in North Seattle, Everett, Tacoma, and Olympia. Link light rail provides an essential transit link for commuters and is a key element of the region's transportation infrastructure.



### ST Express

ST Express provides a fast, reliable, and scenic mode of public transit between major employment and shopping centers in North Seattle, Everett, Tacoma, and Olympia. ST Express provides an essential transit link for commuters and is a key element of the region's transportation infrastructure.

### Our Board

Sound Transit is governed by an 18-member Board made up of local elected officials and the Secretary of the Washington State Department of Transportation. The Board establishes policies and gives direction and oversight.

### Funding

The system plan is paid for with a combination of voter-approved local taxes, federal grants, farebox revenues, investment funds and transit revenues. By 2035, system operating costs will be paid for with local taxes, farebox revenues, interest earnings, private sources and federal operating assistance.

## FUTURE SERVICE

### Sound Transit System Expansion will:

- Build a 110-mile light rail network extending from Everett to Tacoma and from Seattle neighborhoods to Alkondon and Issaquah.
- Establish Bus Rapid Transit (BRT) to the north, east and south of Lake Washington.
- Expand Sounder south low capacity and service adding two new stations.
- Increase service and improve waiting at stations.



# Water Crossings

Terminal operations and freight movement

Railroad operations

Waterway navigation channel

Waterway user needs

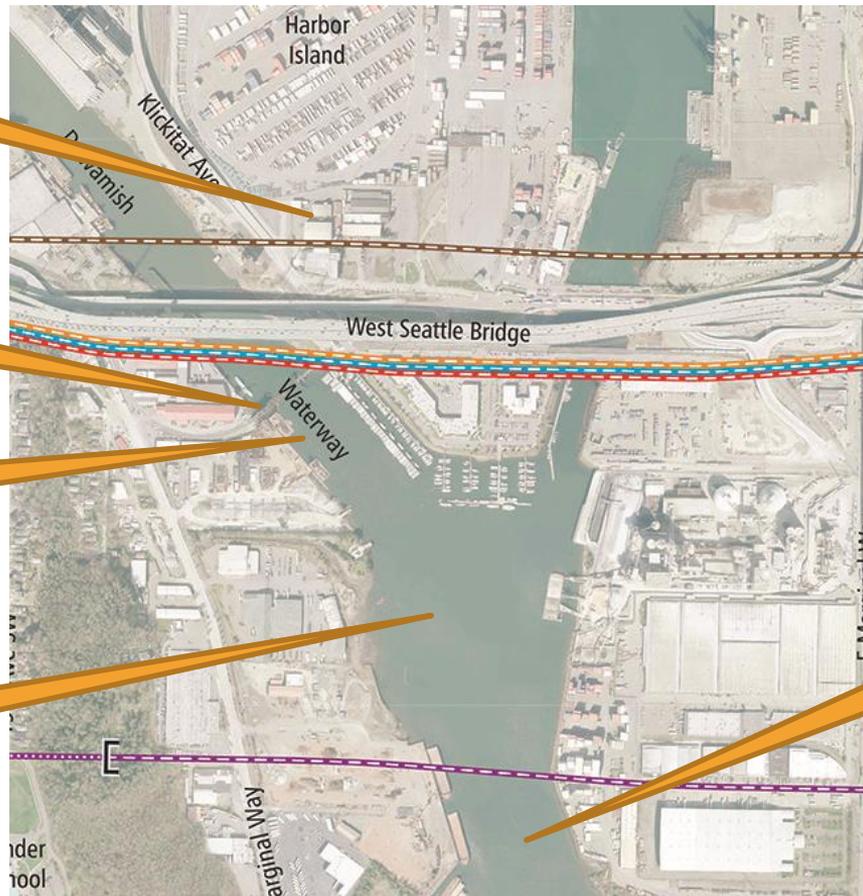
Tribal fishing within the Duwamish River basin

Habitat and cultural resources

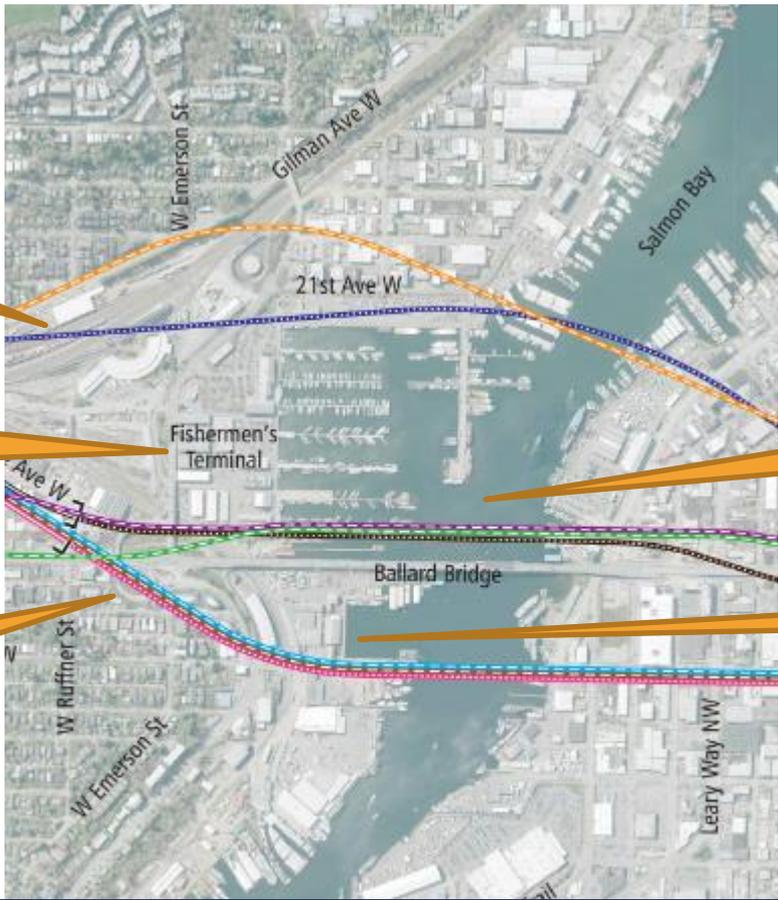
Objects affecting navigable airspace



= Design Consideration



# Duwamish Crossing Design Consideration



Railroad operations

Existing and future maritime business and commerce

Existing and future transportation projects

Tribal fishing in Salmon Bay and access to Puget Sound

Habitat and cultural resources

Federal navigation channel

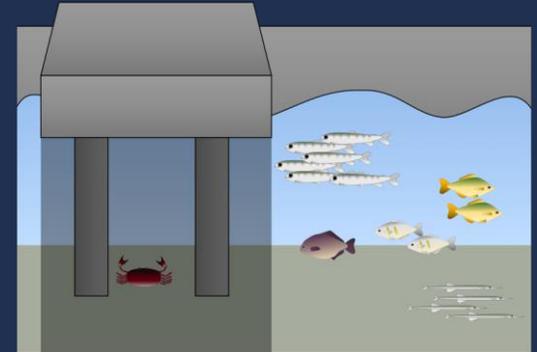
Waterway user needs

 = Design Consideration

# Salmon Bay Crossing Design Consideration

# *Tribal Considerations*

- Lower Duwamish, Elliott Bay, and Salmon Bay are important areas for treaty fishing activities
- Construction and permanent in-water structures both have a potential to disrupt fishing activities and impact habitat for fish
- Upland areas around water crossings have high probability for finding cultural resources during ground disturbance



# *Environmental Permitting for Water Crossings*

- U.S. Army Corps of Engineers (Corps)
- U.S. Coast Guard (Coast Guard)
- National Oceanic and Atmospheric Administration (NOAA) and U.S. Fish and Wildlife Services (USFWS)
- Washington State Department of Ecology (DOE)
- Washington Department of Fish and Wildlife (WDFW)
- City of Seattle

The **U.S. Army Corps of Engineers (Corps)** is responsible for regulating fill and dredging in the water and structures placed in navigable waterways.

If the Project will result in fill or dredging in the water then it will be subject to a Corps permit.

- The Corps must determine that the Project to be built is the “Least Environmentally Damaging Practicable Alternative” (LEDPA).
- Practicability can take into account cost, existing technology, and logistics.



***U.S. Army Corps of Engineers***

The **U.S. Coast Guard (Coast Guard)** is responsible for protecting and preserving navigation.

- Approval from the Coast Guard is required for any temporary or permanent bridges that may impede navigation.



***U.S. Coast Guard***

**National Oceanic and Atmospheric Administration (NOAA) & U.S. Fish and Wildlife Services (USFWS)** are responsible for administering the Endangered Species Act (ESA) and conserving and recovering ESA-listed species and their habitat

- Several ESA-listed fish, birds, and marine mammals are known to occur within the Project area.
- NOAA and USFWS must review and approve Project impacts to these species and their habitat as part of the EIS process.



**NOAA &**



**USFWS**

The **WA State Department of Ecology (DOE)** is responsible for ensuring the project complies with water quality standards and aquatic resource protection requirements

- Permits from DOE are required for stormwater discharges and work that may impact water quality.



***WA State Department of Ecology***

**WA Department of Fish and Wildlife (WDFW)** is responsible for ensuring that the Project is constructed in a manner that protects fish life.

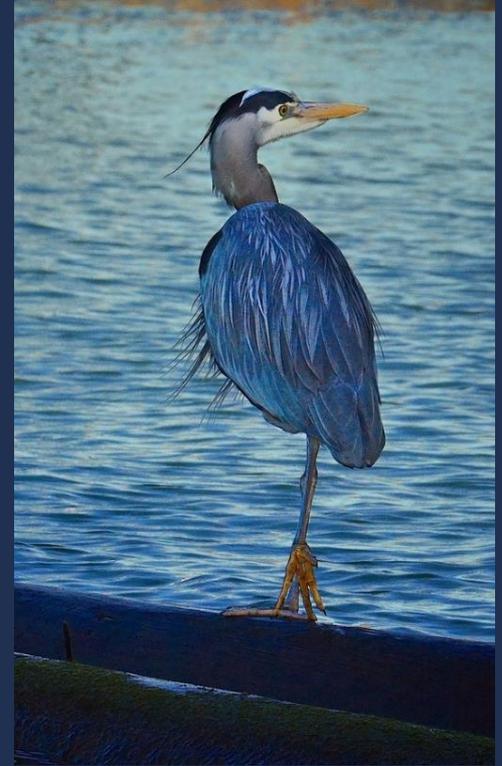
- WDFW will issue a permit for any work that will use, divert, obstruct, or change the natural flow or bed of any water of the state.



***WA Department of Fish and Wildlife***

**City of Seattle** is responsible for regulating impacts to Environmental Critical Areas and Shorelines.

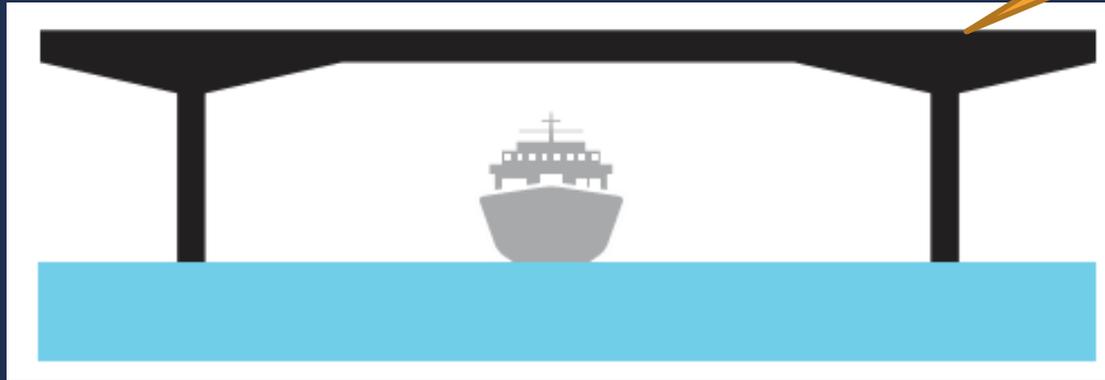
- Environmentally Critical Areas include:
  - Wetlands
  - Geological Hazard Areas
  - Flood Zones
  - Fish and Wildlife Conservation Areas



**City of Seattle**

# High-level fixed bridge

Pier and Foundations

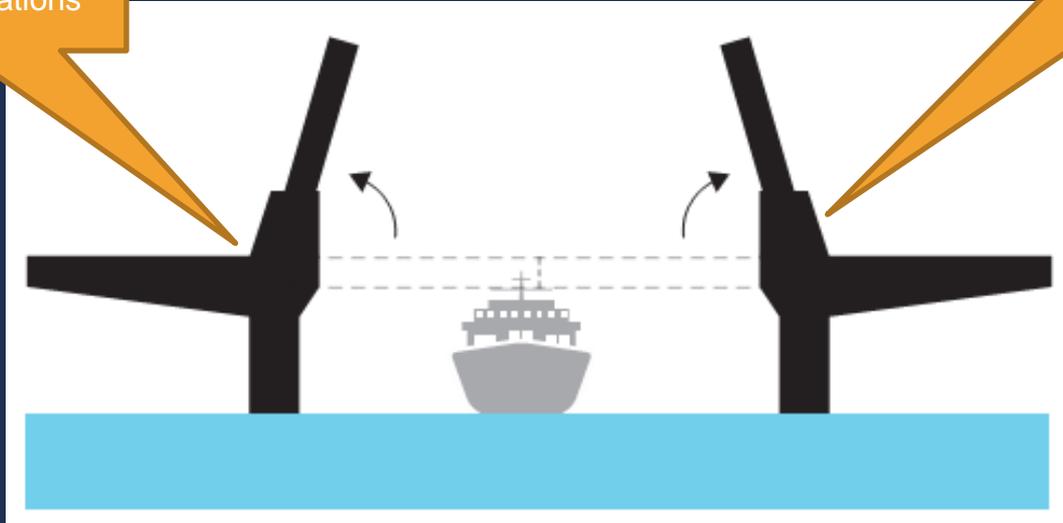


Span Length  
to meet navigation requirement

# Moveable bridge

Pier and Foundations

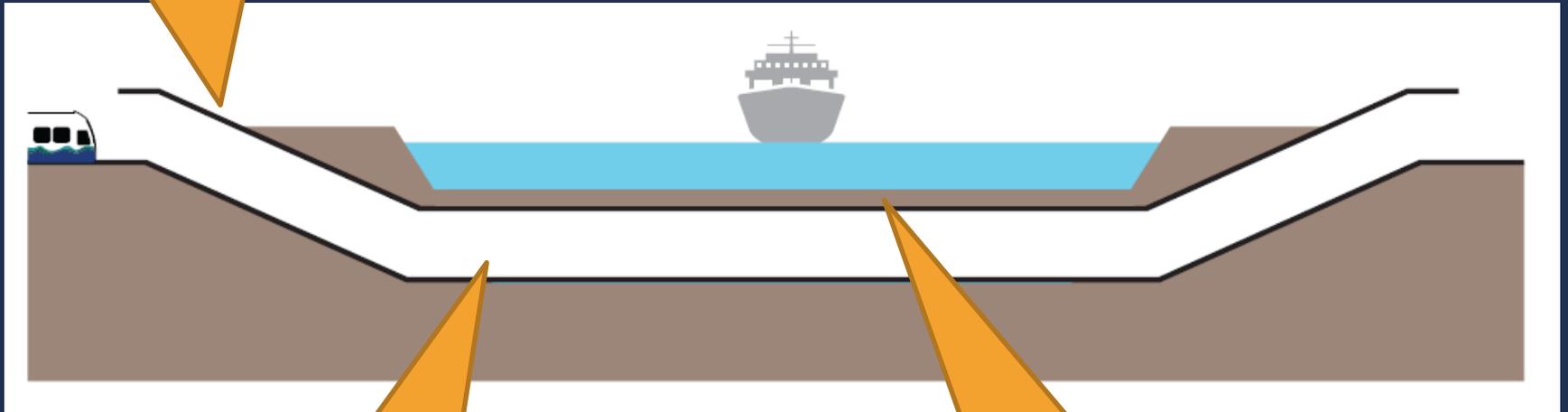
Requires lifting mechanics  
requires maintenance



Span Length  
to meet navigation requirement

# Tunnel

Requires staging area (both sides)

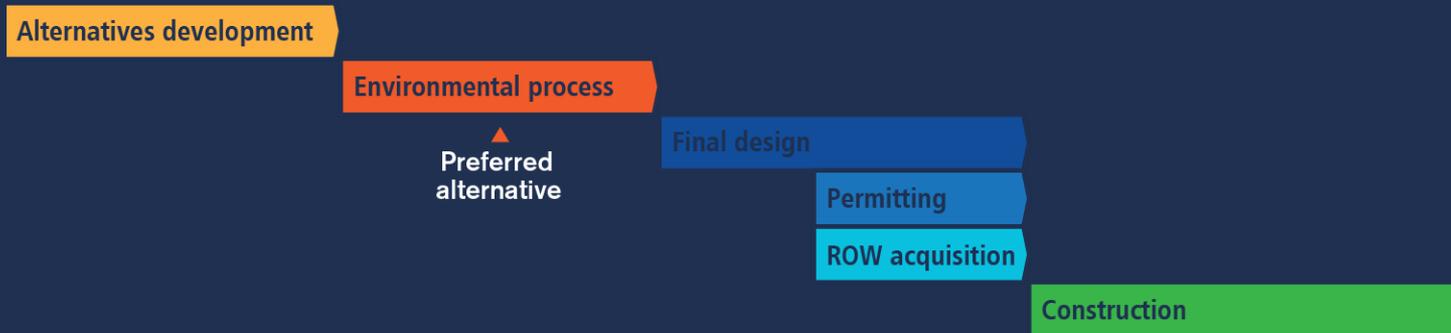


Potential for cross-passage or emergency egress shaft depending on length of tunnel

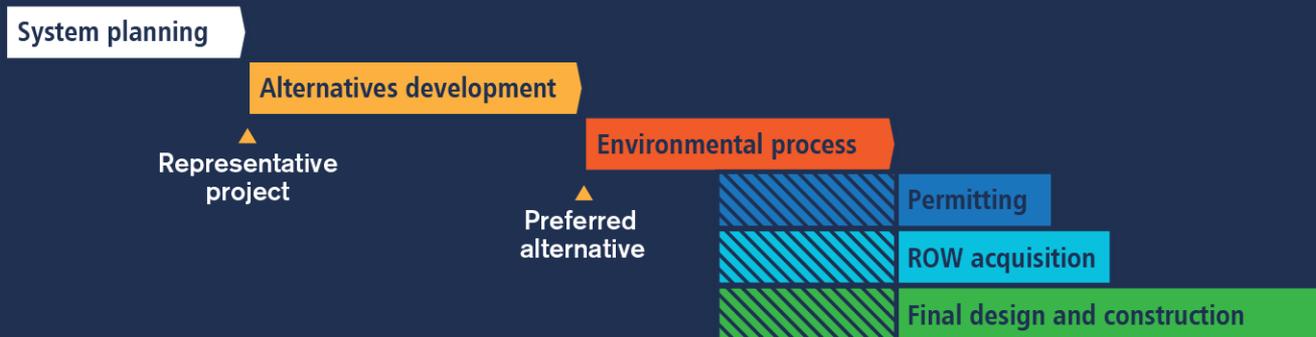
Maintain clearance to bottom of channel

# New approach to project development

## ST2 process



## ST3 process



A light rail train is stopped at a station platform. The train is white with blue and green wavy patterns along the bottom. The platform is paved with grey tiles and has a yellow tactile strip along the edge. Several people are on the platform: a man in a dark shirt and grey pants is boarding the train; a woman in a pink top and black pants is walking; a man in a grey t-shirt and khaki pants is walking; a woman in a white top and light blue pants is walking; and a man in a white t-shirt and khaki pants is walking. In the background, there are buildings, trees, and a blue sign with a white train icon. The text "Next steps" is overlaid in the center of the image.

***Next steps***

# Upcoming Level 2 Meetings

<b>ELG Meeting</b> July 19, 2018	<ul style="list-style-type: none"><li>• Stakeholder/community engagement</li><li>• Chinatown/ID &amp; SODO alignment and station alternatives</li></ul>
<b>SAG Meeting #8</b> Sept. 5, 2018	<ul style="list-style-type: none"><li>• Stakeholder/community engagement</li><li>• Level 2 evaluation results</li></ul>
<b>SAG Meeting #9</b> Sept 26, 2018	<ul style="list-style-type: none"><li>• Stakeholder/community engagement</li><li>• Level 2 recommendations</li></ul>
<b>ELG Meeting</b> Oct. 5, 2018	<ul style="list-style-type: none"><li>• Stakeholder/community engagement</li><li>• Level 2 recommendations</li></ul>



*soundtransit.org/wsblink* 

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