## Ballard Link Extension

CID additional study results and South Downtown Hub progress

System Expansion Committee 11/14/2024



## Why we're here today

- Chinatown-International District (CID) additional studies for Ballard Link Extension
- Update on South Downtown Hub progress

No action today



## Agenda

- I. Project overview
- II. CID additional study results
  - a. Construction approach and duration review
  - b. Maximizing regional and local connections
- III. South Downtown Hub progress
- IV. Discussion & Next Steps



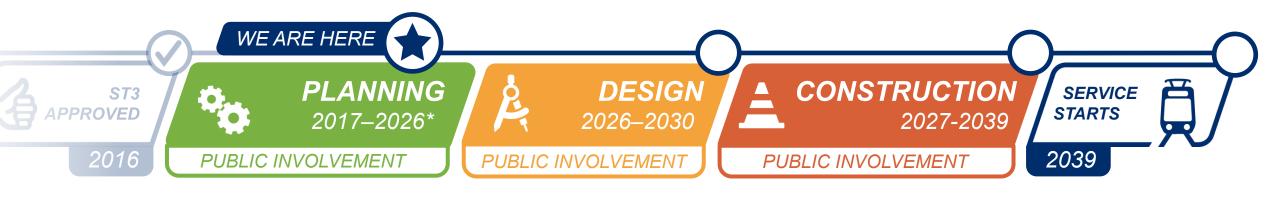
## Project overview



### **Ballard Link Extension**

- ✓ Included in Sound Transit 3 (ST3) voter approved plan.
- ✓ Adds nearly eight miles of light rail service, including a new light rail-only downtown tunnel.
- ✓ Includes nine new stations from Chinatown-International District to Ballard.

## Ballard Link Extension (BLE) Project timeline







2016



## PLANNING



2017-2023

#### **Alternatives development**

- 2018: Early scoping
- 2019: Scoping
- 2019: Board identifies preferred alternatives and other alternatives

#### **Environmental review**

- 2022: Publish WSBLE Draft EIS
- 2023: Board confirms or modifies preferred alternatives

2024-2026

**Environmental review** 

Fall 2024: NEPA Scoping

2025: Publish BLE Draft EIS

Public comment period

Board confirms or modifies preferred alternatives

2026: Publish BLE Final EIS

Board selects project to be built

Federal Record of Decision

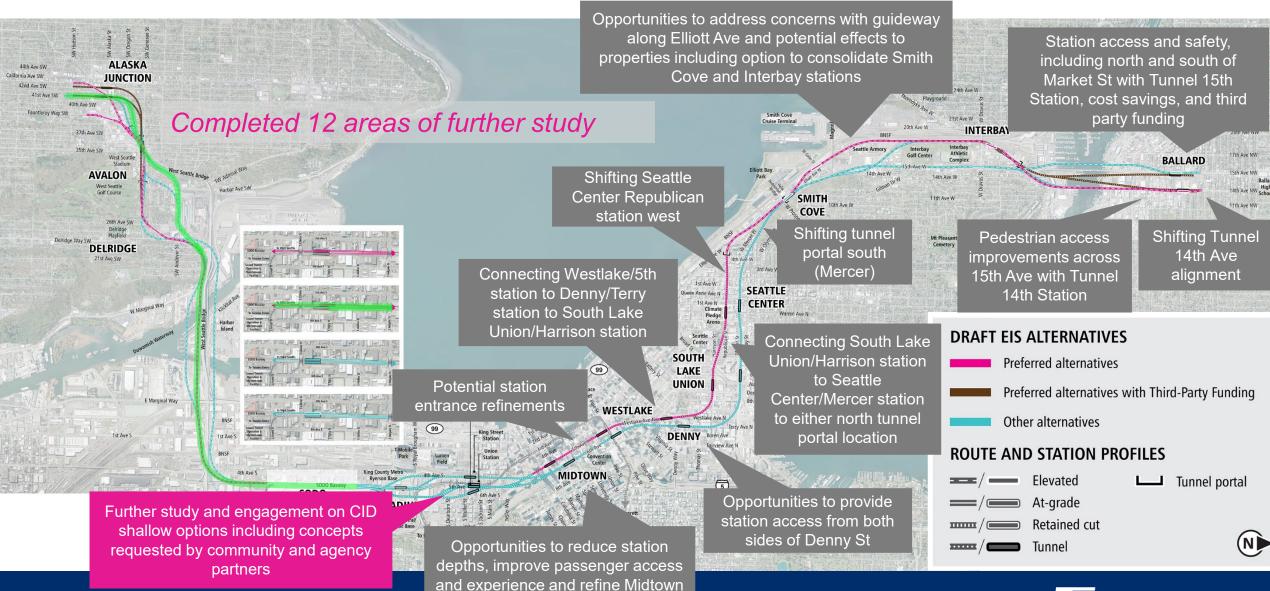
### RET: Centering community input

- Recognize the multitude of past harms inflicted on the community from past infrastructure projects and policies that have ongoing effects today
- Strong concern over displacement of businesses in the CID, which are valued as places of gathering and community wealth-building, and potential loss of cultural identity and community ownership of land
- Desire to see additional near-term engagement between community and agency partners to collectively address remaining questions, minimize potential impacts and maximize community benefits, whether as part of design, through mitigation approaches, or as part of broader partnerships
- Support for investment in public spaces that foster connections between CID and Pioneer Square, promote safety and a sense of belonging, and support for an improved experience for riders accessing transit services





## BLE Areas of Further Study Completed (2022-2023)



station entrance





2016



## PLANNING



#### 2017-2023

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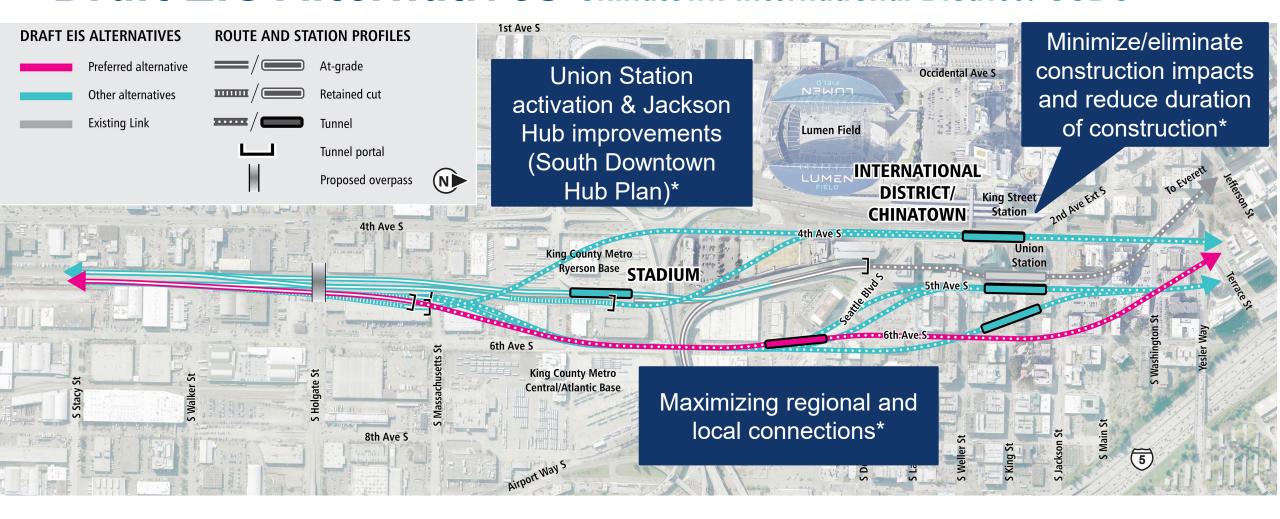


#### Green Lake **Ballard** NW Market St Interbay W Dravus St Lake Union Magnolia Bridge Seattle South **Smith Center Lake Union** Cove Denny Westlake Link light rail Midtown **Ballard Link Extension** Preferred alternative Other Draft EIS alternatives S Jackson St Int'l District/ Puget Sound Route profiles Chinatown **I**■■ Elevated route Tunnel route **Stadium** Surface route 90 **†** Ballard Link **→** West Seattle Link

## Ballard Link Extension alternatives

- Preferred alternative
- Other EIS alternatives

#### Draft EIS Alternatives Chinatown-International District / SODO



\*Key areas identified in Board motion from March 2023 for additional study





2016



## PLANNING



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# Construction approach and duration review

## Construction approach and duration review

Based on community feedback and Sound Transit Board requests, the Sound Transit technical team conducted the following activities to optimize CID alternatives:

- ✓ Conducted extensive further studies in the fall of 2022 and early 2023, including engaging community through workshops, consultants and agency partners.
- ✓ Engaged with the **independent consultant** to the Sound Transit Board to review refinement ideas, particularly for the 4th Avenue Shallow alternative, and gather any additional ideas.
- ✓ Convened an independent expert panel to review the design for CID alternatives, construction approach and duration, and to offer new ideas on how to construct the 4th Ave Shallow Alternative in support of reducing construction duration and impacts.
- ✓ Refined the design and construction approach to incorporate opportunities that may reduce the construction duration and/or related impacts.





#### **Ballard Link Extension**

#### **Station Alternatives**

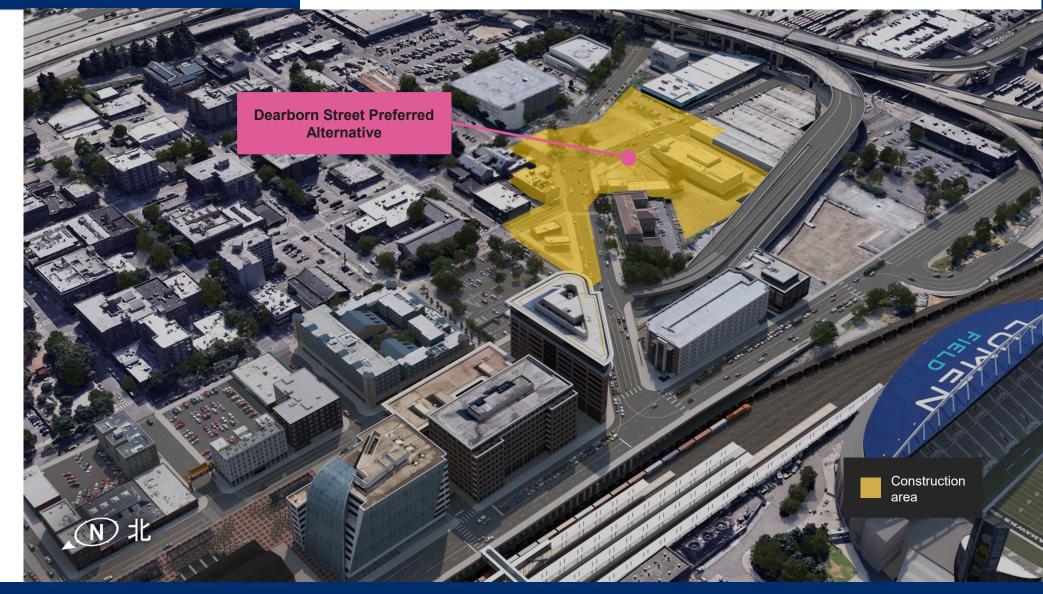
The following provides information on construction duration drivers and construction activities associated with the following CID Station alternatives:

- Dearborn Street Preferred Alternative
- 5<sup>th</sup> Avenue Shallow Diagonal Alternative
- 4<sup>th</sup> Avenue Shallow Alternative



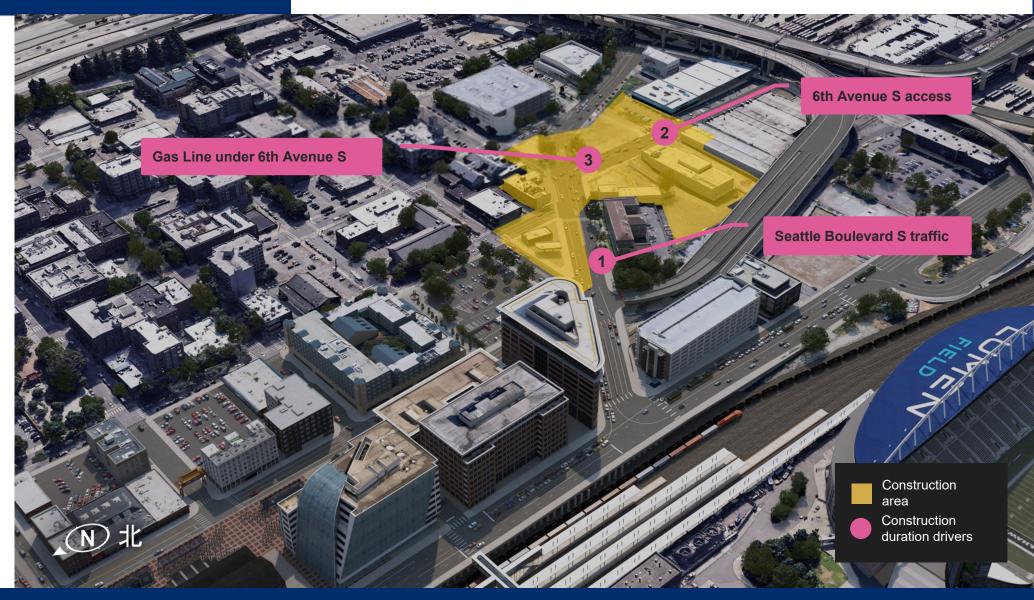








**Construction Duration Drivers** 





## **Construction Sequence** and **Methods**

**Stage One: Station excavation** 

Major work during this stage would include:

- 1. Demolition of existing buildings
- 2. Gas line relocation (if protecting in place is determined not to be possible)
- 3. Decking to maintain traffic on Seattle Boulevard S
- 4. Station wall construction
- 5. Station excavation

This work is anticipated to take approximately three years.



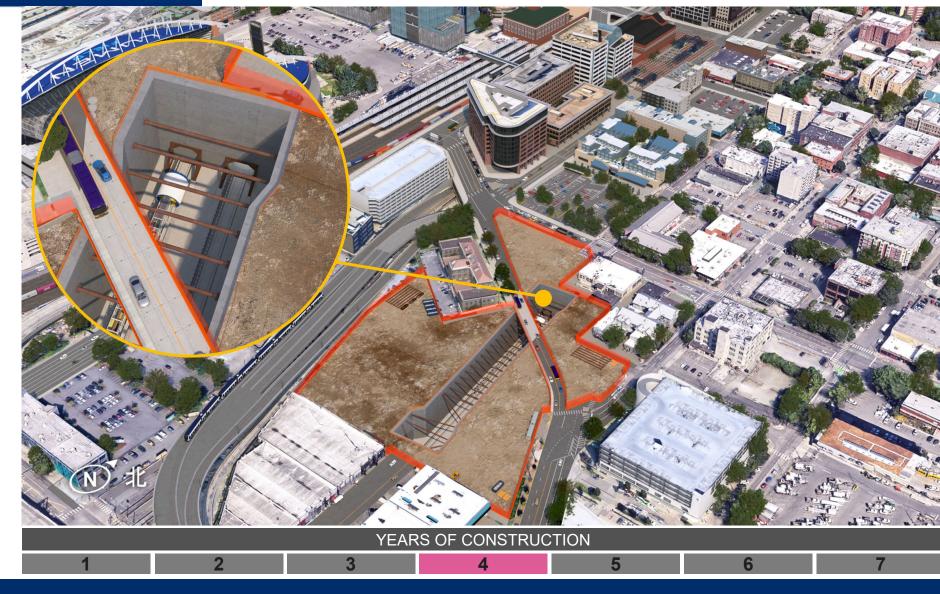
## **Construction Sequence** and **Methods**

Stage Two: Tunnel Boring Machine (TBM) arrivals/departures

Major work during this stage would include:

- 1. TBM arrival at the station
- 2. TBM maintenance and re-launch of TBMs to next station

This work is anticipated to take approximately one year of intermittent activity.





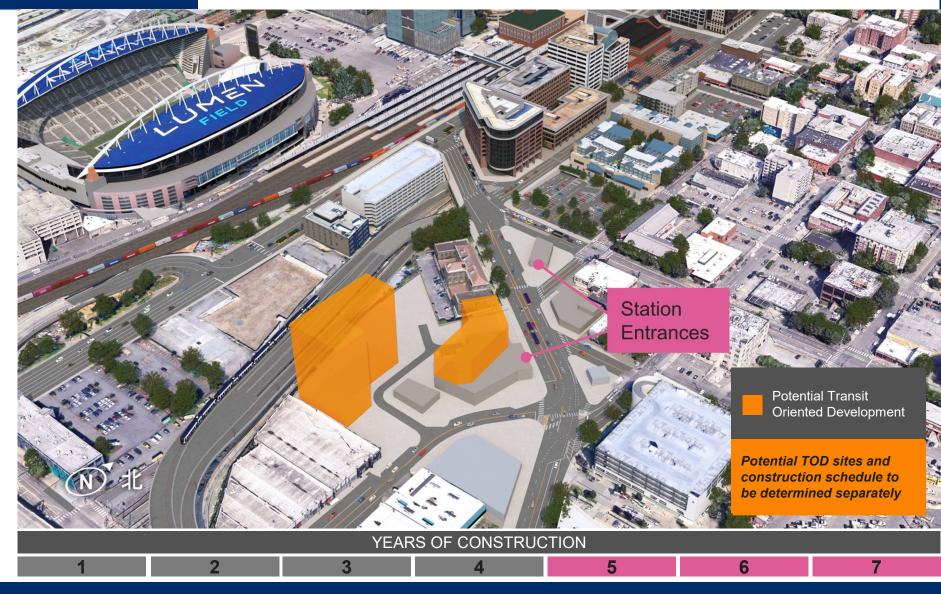
## **Construction Sequence** and Methods

**Stage Three: Station internal structures** 

During this stage, station finishes would be installed, including:

- 1. Station platforms, escalators, elevators, and station entrances
- 2. Track, signal, Mechanical and electrical systems
- 3. Roadway restoration
- 4. Construction complete

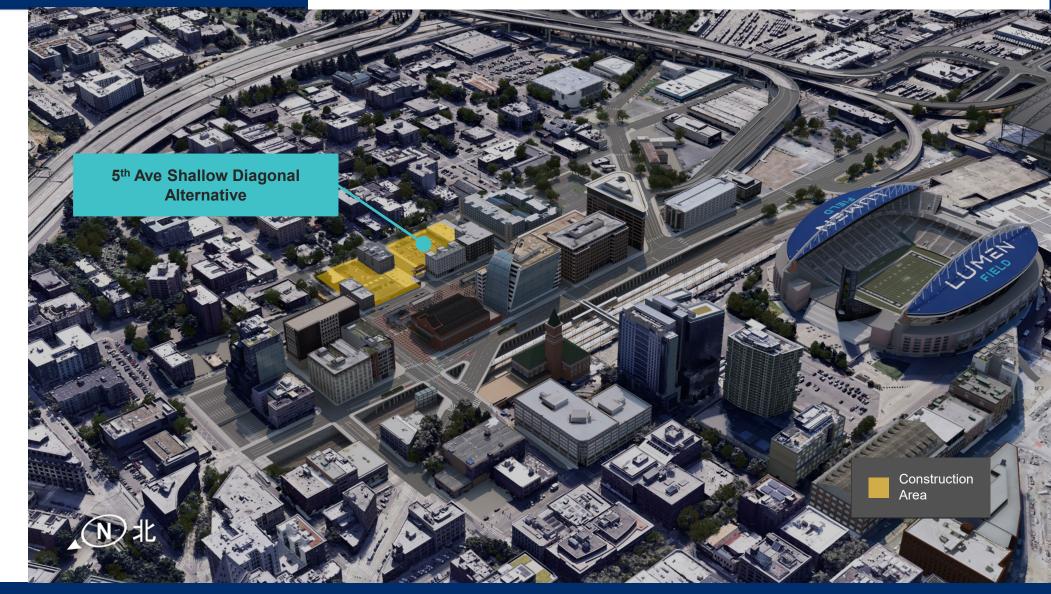
This work is anticipated to take approximately two to three years.





## 5th Avenue Shallow Diagonal Alternative







**Construction Duration Drivers** 





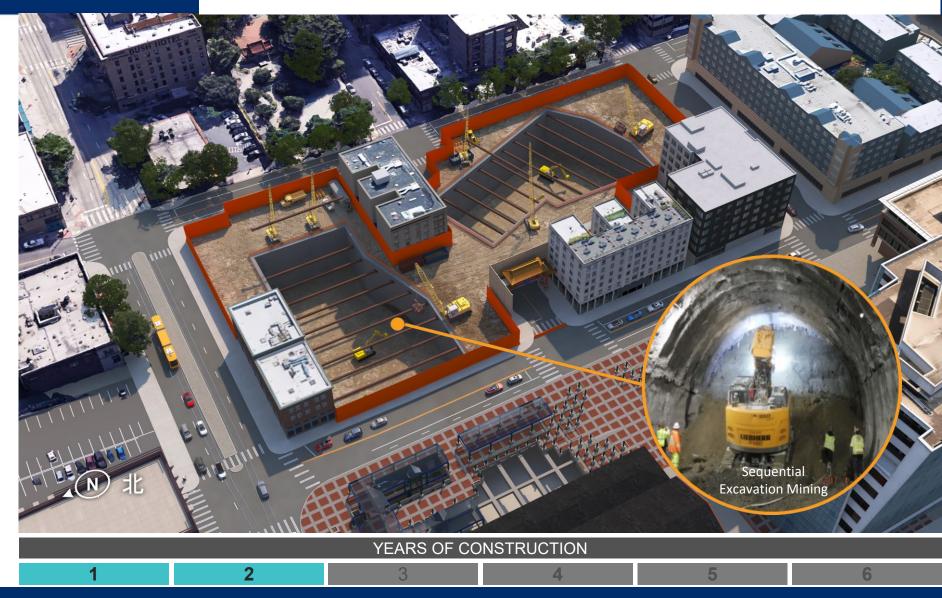
## **Construction Sequence** and **Methods**

**Stage One: Station excavation** 

Major work during this stage would include:

- 1. Protection of Historic Chinatown Gate
- 2. Demolition of certain existing buildings identified within the construction area
- 3. Station wall construction
- 4. Station excavation and mining

This work is anticipated to take approximately two years.





## **Construction Sequence** and **Methods**

Stage Two: Tunnel Boring Machine (TBM) arrivals

Major work during this stage would include:

- 1. TBM arrival at the station
- 2. TBM removal and transport from site

This work is anticipated to take approximately one year of intermittent activity.





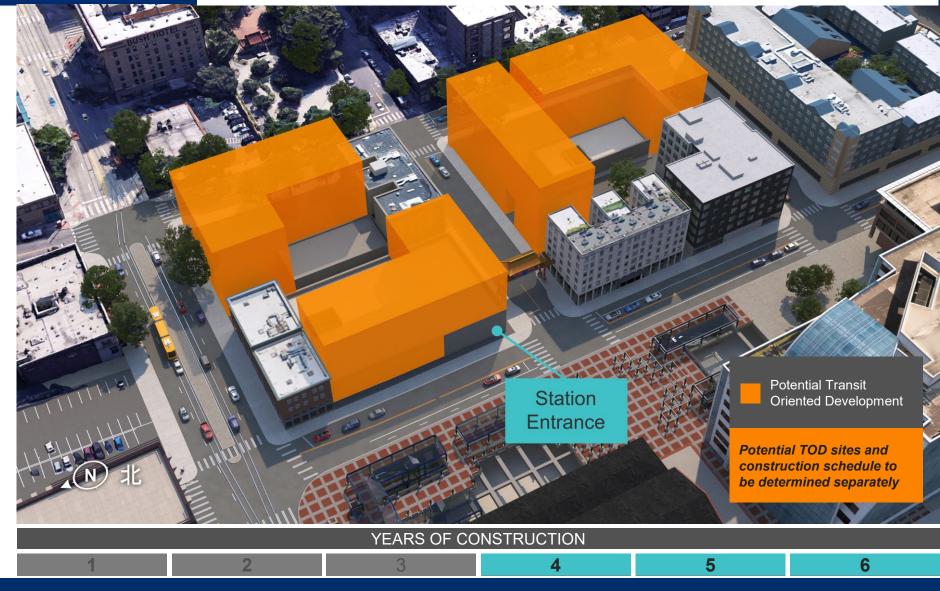
## **Construction Sequence** and **Methods**

**Stage Three: Station internal structures** 

During this stage, station finishes would be installed, including:

- Station platforms, escalators, elevators, and station entrances
- Underground passenger connection to existing International District/Chinatown Station
- 3. Track, signal, mechanical and electrical systems
- 4. Construction complete

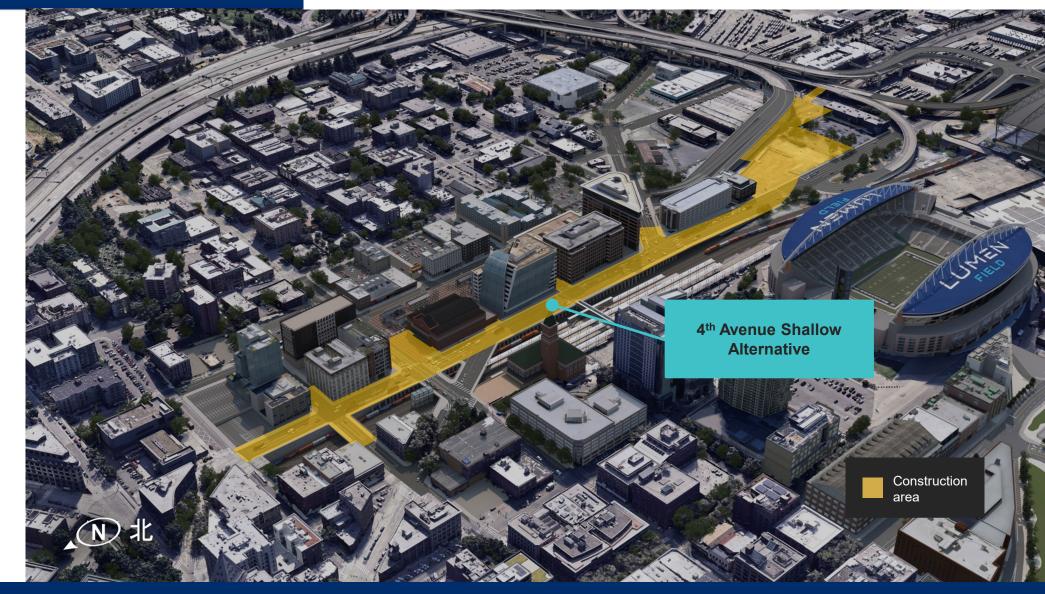
This work is anticipated to take approximately two to three years.





# 4<sup>th</sup> Avenue Shallow Alternative







**Construction Duration Drivers** 





## **Construction Duration Drivers**

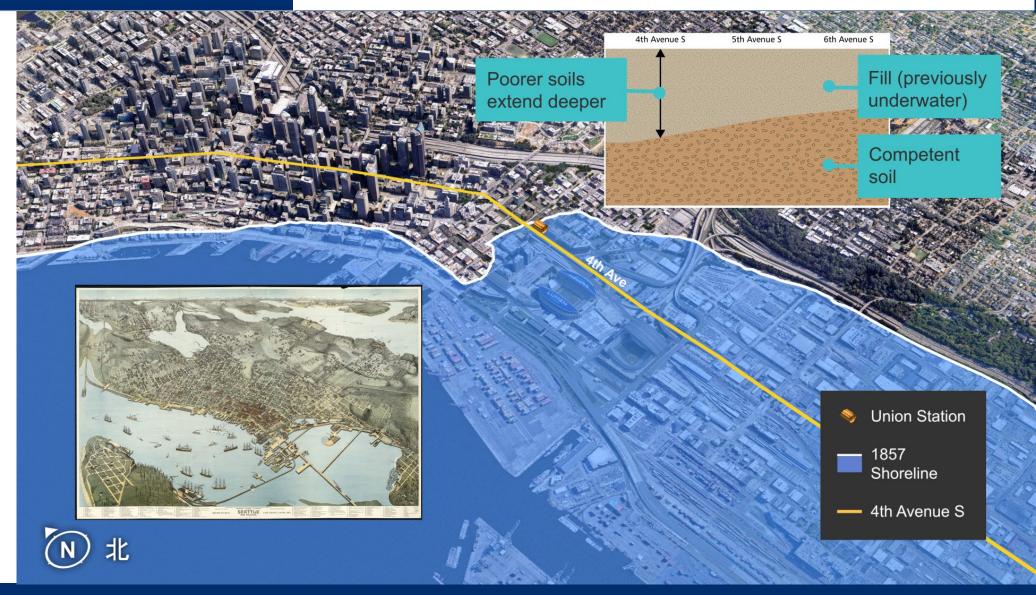
Soil Conditions





## **Construction Duration Drivers**

Soil Conditions





## **Construction Duration Drivers**

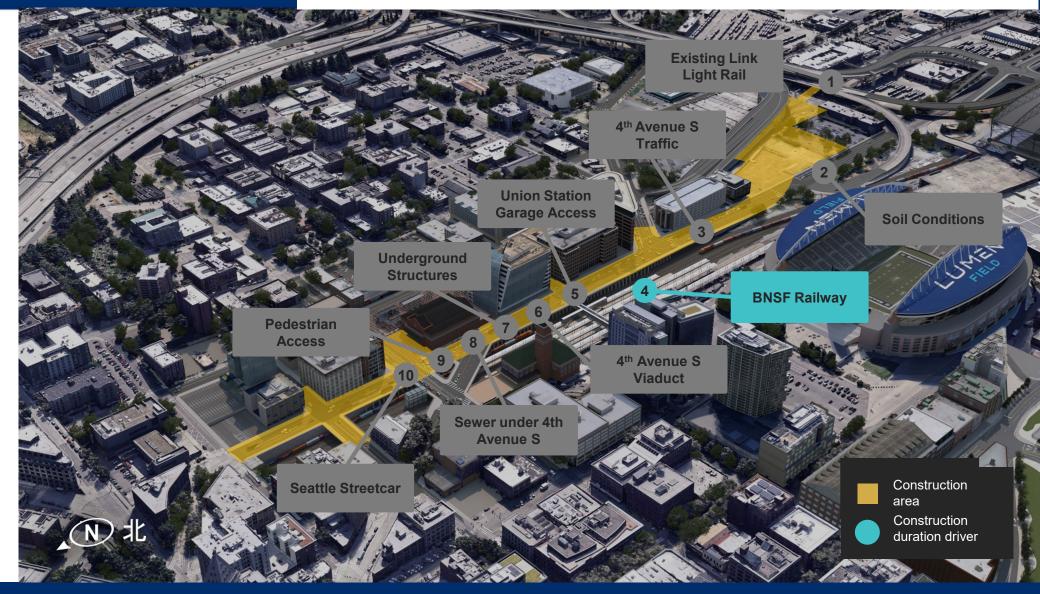
4<sup>th</sup> Avenue S Traffic





## **Construction Duration Drivers**

BNSF Railway





## **Construction Duration Drivers**

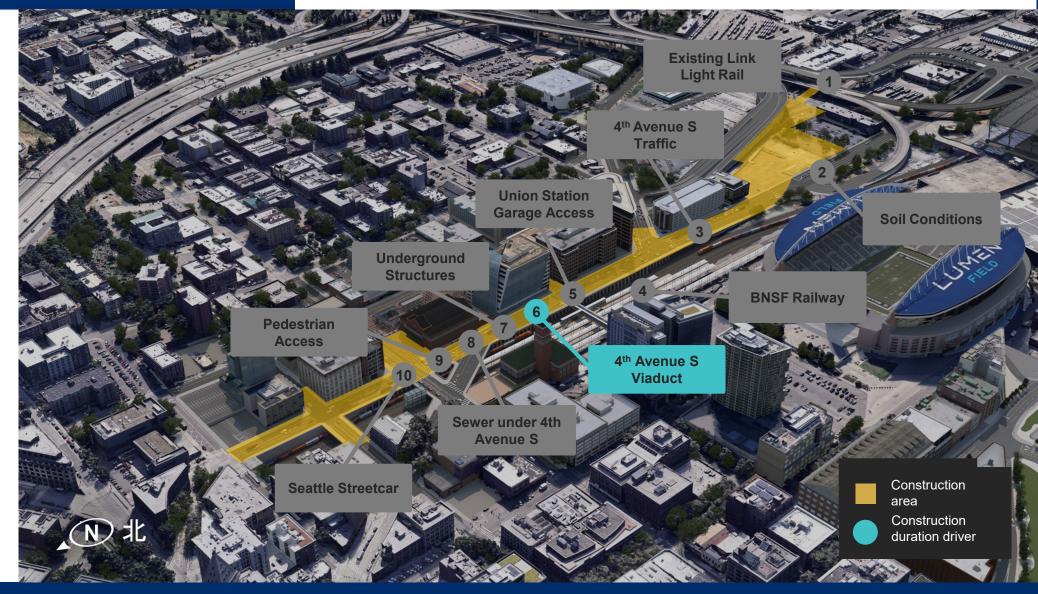
BNSF Railway





# **Construction Duration Drivers**

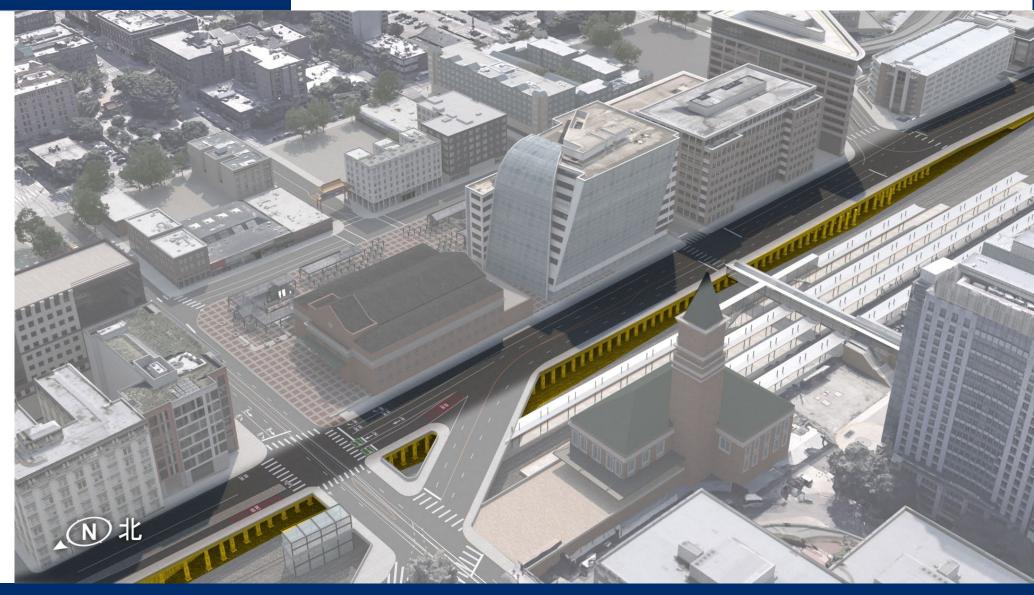
4<sup>th</sup> Avenue S
 Viaduct





# **Construction Duration Drivers**

4<sup>th</sup> Avenue S
 Viaduct





# **Construction Duration Drivers**

 Underground Structures





# **Construction Duration Drivers**

 Underground Structures





# 4th Avenue Shallow alternative refinement process

## **WSBLE Further Studies (2022-2023)**

## **BNSF Railway Proximity**

- Construction approach modified to address BNSF concern about proximity of construction to active freight operations
- Secant walls rather than slurry walls used for construction next to BNSF
- Resulted in lengthening construction duration by one year
- Does not resolve all risks associated with construction next to BNSF



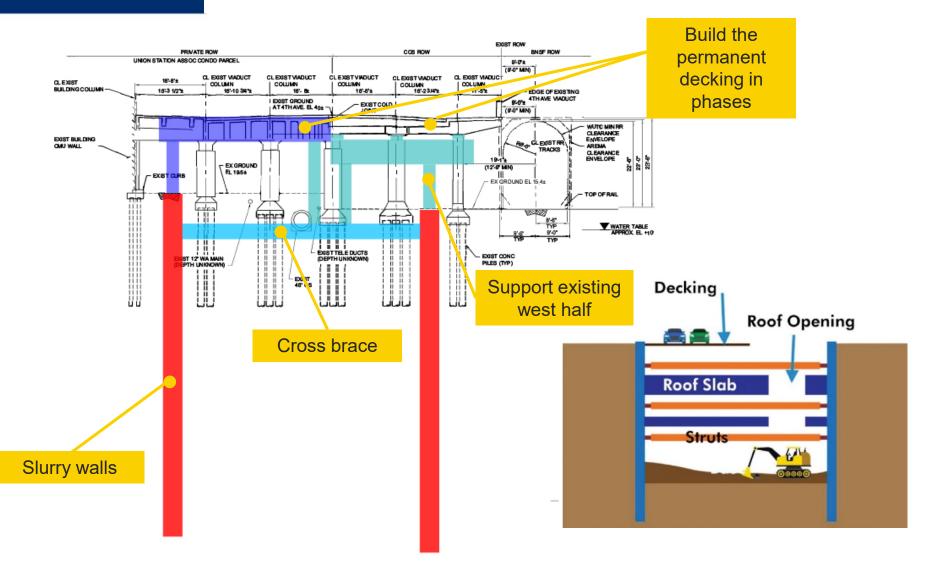




## Independent consultant to the Board ideas

# "Top down" construction with new permanent viaduct

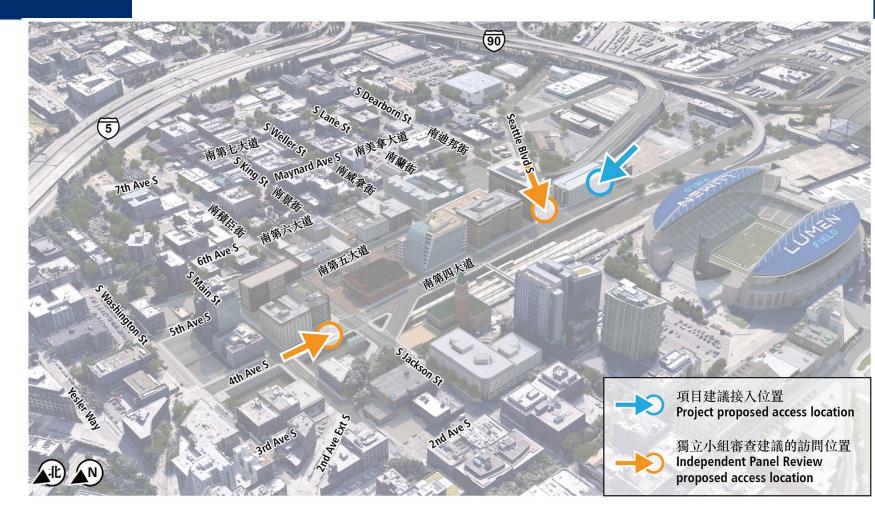
- Permanent rather than temporary deck
- Reduces duration of traffic effects by one year
- ✓ Incorporated into design as part of further studies in late 2022 and early 2023





# Multiple construction access locations

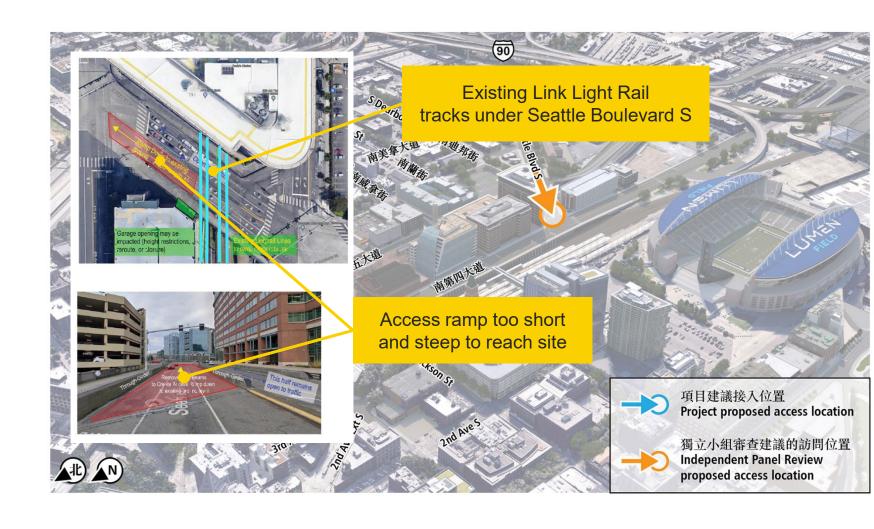
 Additional construction access location suggested by panel to reduce construction duration





# Multiple construction access locations

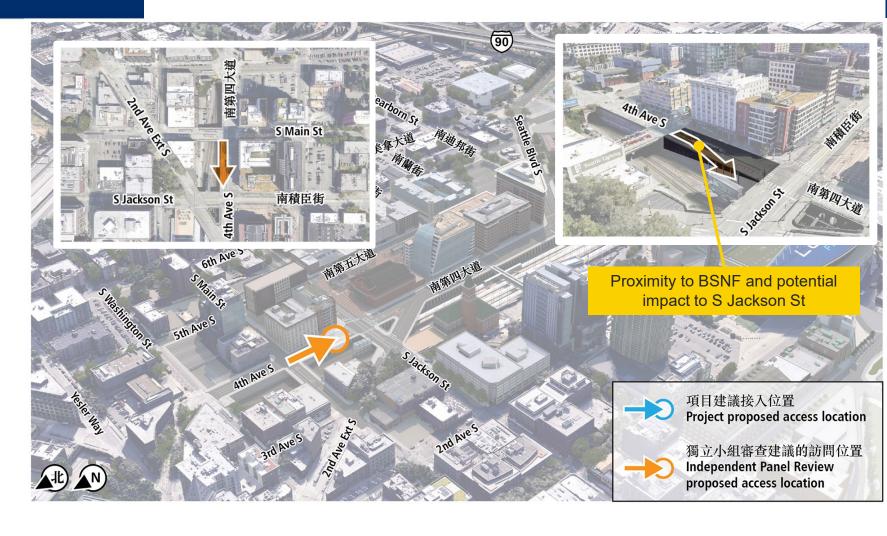
- Additional access location suggested at Seattle Boulevard
- Not enough space for ramp, too steep for construction equipment
- Not incorporated into design





# Multiple construction access locations

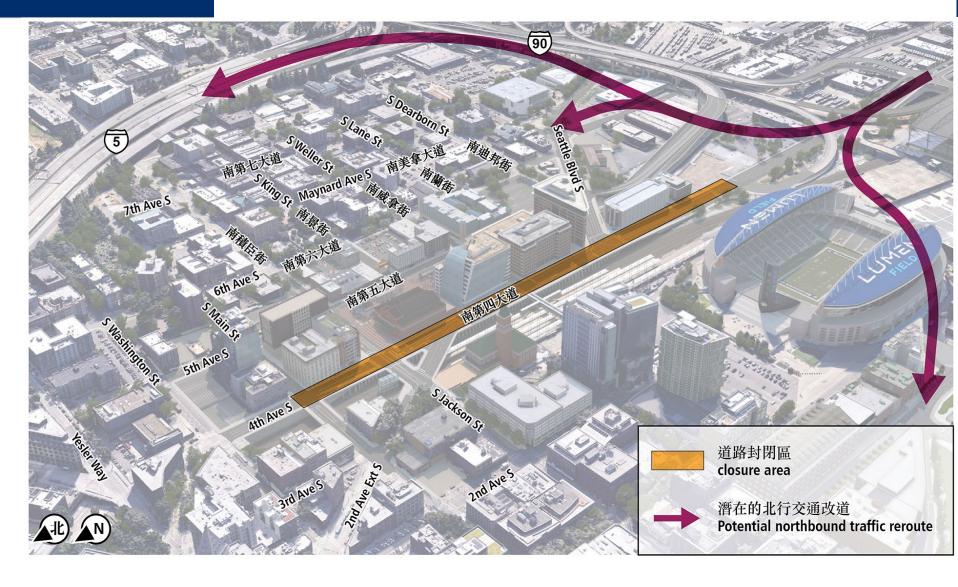
- Additional access location suggested at Main Street
- Proximity to BNSF railway, conflict with existing retaining wall, minimal available space
- Not incorporated into design





#### Full traffic closure

- Proposed full closure of 4th Avenue for up to four years
- Could reduce overall construction duration by up to three and a half years
- Would likely result in substantially greater traffic and transit detours into CID and Pioneer Square neighborhoods
- Some traffic could detour to regional transportation facilities such as I-5 and SR 99
- Not incorporated into design

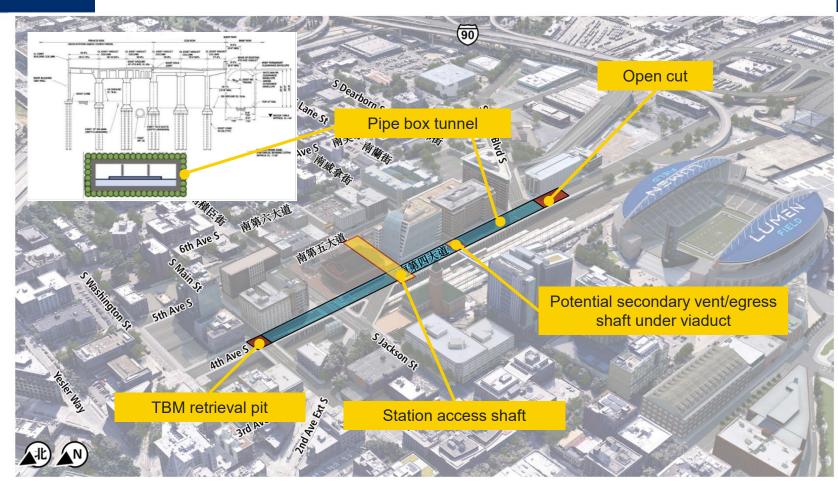






## Pipe box

- Never been done before:
   Length would exceed any achieved for this construction method to date, posing substantial risk
- Could potentially avoid need to demolish 4th Avenue viaduct and reduce construction duration by four years
- Station would need to be very deep and would be an elevator-only station
- At least some of viaduct would still need to be reconstructed to accommodate vertical construction shafts
- Not incorporated into design





# Additional 4th Shallow refinement ideas

Refinement ideas	Findings	Included in design in DEIS?
Build the tunnel station without demolishing the existing viaduct	<ul> <li>Low headroom to construct below viaduct, requiring specialized equipment that would greatly reduce productivity</li> <li>Challenge to maintain viaduct above active light rail</li> </ul>	No
Retained cut with Canopy	<ul> <li>Would not be considered an open station, still requires mechanical ventilation</li> <li>Not possible to provide necessary support for new viaduct and allow for phased construction to maintain traffic</li> <li>Would require passengers to travel under platform to exit station</li> </ul>	No
Station at ground level, avoiding underground construction	<ul> <li>Not adequate space for ventilation and emergency egress stairs</li> <li>Underground construction still required to provide passenger circulation</li> <li>Not possible to provide necessary support for new viaduct and allow for phased construction to maintain traffic</li> <li>Crash walls next to BNSF may be needed, adding cost and complexity</li> </ul>	No
Conveyor belts	<ul> <li>Standard industry practice often used by contractors; already likely to be used (no additional time savings)</li> </ul>	TBD in future phase
Multiple shifts	<ul> <li>Current construction duration assumes surface construction would occur 10 hours per day, 6 days per week; Underground tunnel work would occur 24 hours per day, 7 days per week. Additional shifts would be difficult to achieve.</li> <li>Any additional shifts &amp; duration savings would apply to any CID alternative</li> </ul>	TBD in future phase

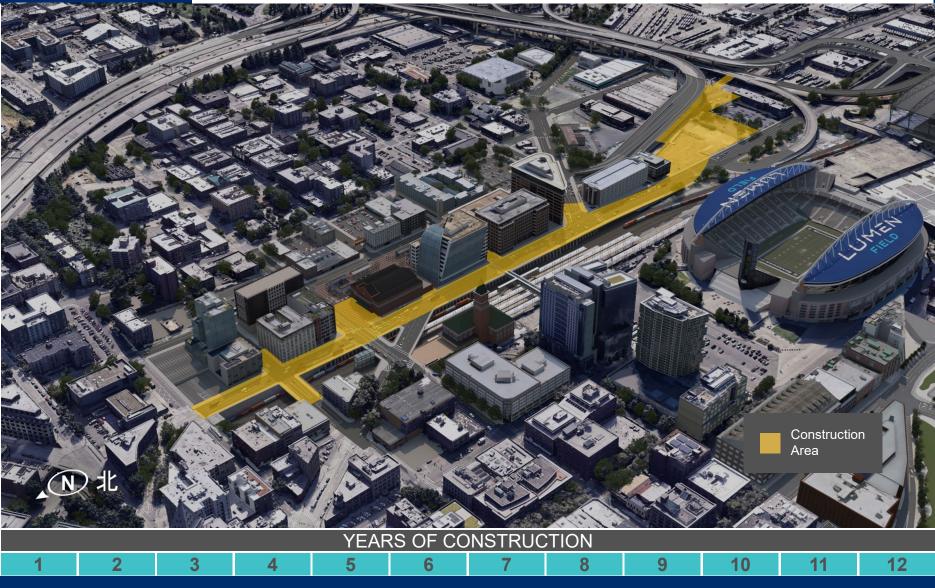


# 4th Avenue Shallow Alternative construction sequence and methods

# **Construction Sequence** and **Methods**

### **Construction Activities**

- 3 stages spanning 10 to 12 years
- Activities include ideas moved forward from refinement process





# **Construction Sequence** and Methods

Stage One: I-90 to S Jackson Street, east side of 4th Avenue S

- 1. 4th Avenue S viaduct demolition
- 2. Cut-and-cover tunnel construction
- New permanent 4th Avenue S structure and roadway construction

This is anticipated to take approximately two years.

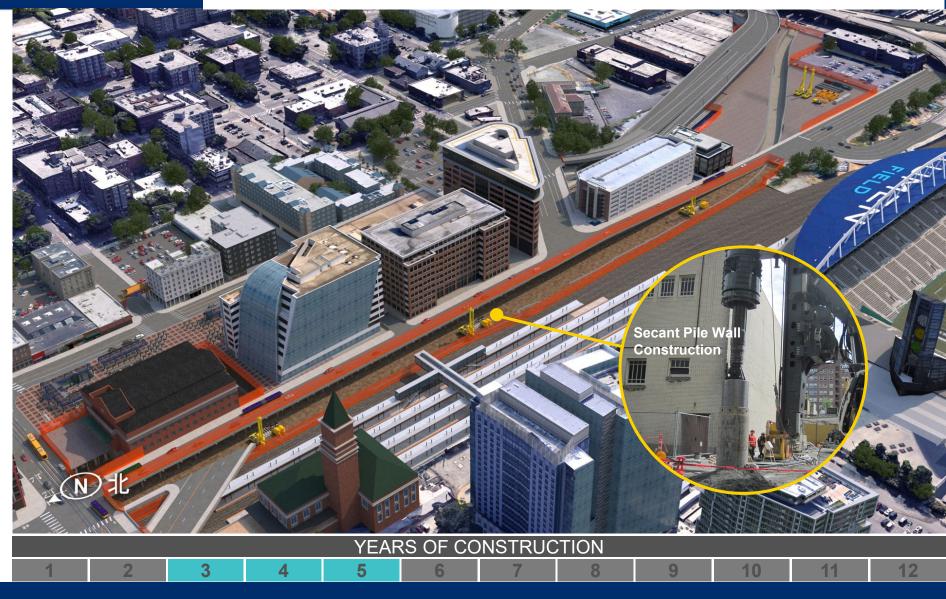


# **Construction Sequence** and Methods

Stage Two: I-90 to Jackson Street, west side of 4th Avenue S

- 4th Avenue S viaduct demolition
- 2. Cut-and-cover tunnel construction
- New permanent 4th Avenue S structure and roadway construction
- 4. Sewer line relocation
- 5. Station and tunnel excavation under new 4th Avenue S viaduct

This stage is anticipated to take approximately three years.



**SoundTransit** 

# **Construction Sequence** and Methods

# Stage Three: S Jackson Street to S Main Street

- Temporary decking for ICON apartment building
- S Main Street bridge demolition over BNSF train tracks
- 3. 4th Avenue S viaduct demolition and S Jackson Street
- 4. Demolition of a retaining wall system adjacent to the BNSF train tracks
- 5. Cut-and-cover tunnel construction
- New permanent 4th Avenue S roadway and S Jackson Street bridge reconstruction
- 7. S Main Street bridge reconstruction over BNSF train tracks

This is anticipated to take approximately four years.

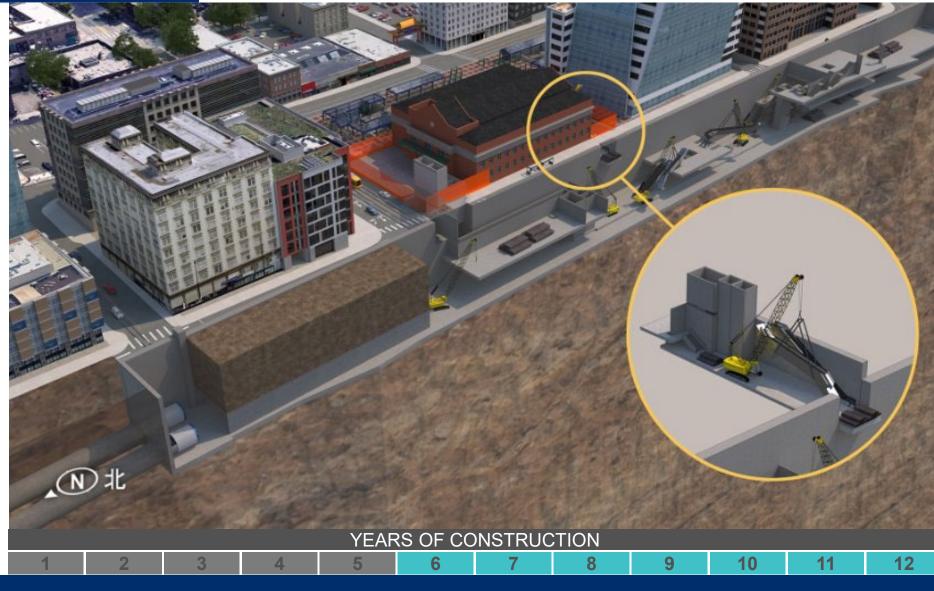


# **Construction Sequence** and **Methods**

## **Stage Four: Station construction**

- 1. Station platforms, escalators, elevators, and station entrances
- 2. Underground passenger connection to existing International District/Chinatown Station
- 3. Track, signal, mechanical and electrical systems
- 4. Construction complete

This is anticipated to take approximately five to seven years and would overlap with Stage 3.

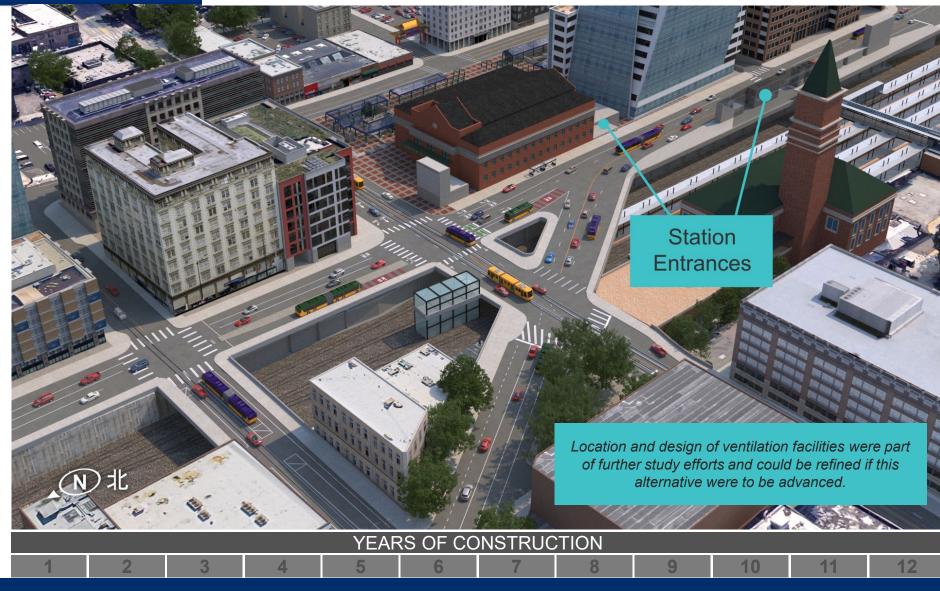


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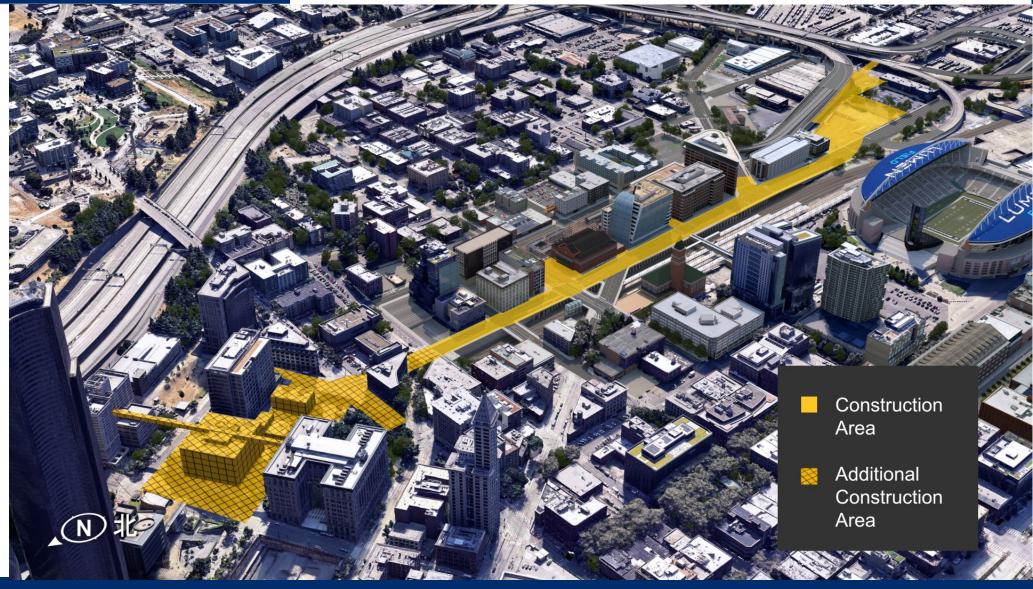
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#### Additional major work includes:

- Cut-and-cover tunnel construction between S Main Street and Jefferson Street
- Reconstruction of retaining wall adjacent to BNSF train tracks between S Main Street and Jefferson Street
- Yesler Way bridge reconstruction (S Main Street bridge over BNSF train tracks would not be demolished and reconstructed)

This work would occur during Stage 3 and have a similar construction duration as Stage 3 for 4th Shallow Alternative.





# Summary

- The Dearborn Street Preferred Alternative is expected to take about 6-7 years to construct, with a limited number of construction duration drivers (gas line, Seattle Blvd and 6<sup>th</sup> Avenue)
- The 5th Avenue Shallow Diagonal Alternative is expected to take about 5-6 years to construct
  with construction duration drivers including prioritizing minimizing business displacements, minimizing
  effects to historic buildings and avoiding effects to the Historic Chinatown Gate
- The 4th Avenue Shallow and Shallower Alternatives are expected to take 10-12 years to construct with construction drivers including very limited construction access, proximity to BNSF Railway, poor soil conditions, complex underground structures, and more
  - > Independent experts were consulted to develop ideas to further reduce duration and impacts
  - ldeas were reviewed and incorporated where shown to reduce duration and community impacts (ideas incorporated into the Draft EIS design do not ultimately reduce the construction duration overall)
  - One idea, full closure of 4<sup>th</sup> Avenue South, may reduce construction duration by up to 3.5 years, but would result in increased community impact with substantially greater traffic detours locally and regionally
  - Refinement ideas do not address construction duration risk related to proximity to BNSF



# Cost drivers and risk: 4th Avenue Shallow

## Construction duration risk:

 Risk of increase to construction duration (beyond 10 to 12 years) due to stringent safety requirements and other restrictions with construction next to active BNSF Railway mainline tracks; delays could affect the entire BLE project schedule

## Scope growth:

- Additional scope to rebuild 4<sup>th</sup> Avenue viaduct
- Construction complexity:
  - Construction next to and over the active BNSF Railway mainline tracks
  - Complex construction sequencing due to lack of construction staging access while maintaining traffic and pedestrian access on 4<sup>th</sup> Avenue S in this constrained area
  - Maintaining traffic and neighborhood access during construction

## Market conditions:

- Risk profile of the job will limit competition and increase the markup
- Bridge structure construction experience over a tunnel station and tunneling construction experience may affect competition



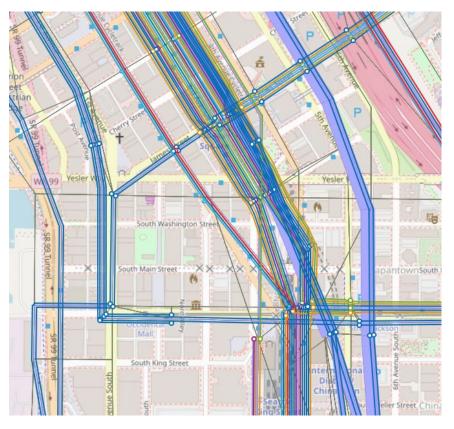
# Maximizing regional and local connections

# Maximizing regional and local connections

- Developed ridership assessment to understand difference for local and regional travel between alternatives
- Assessed differences to regional and local access trips (examined sample trips, updated trip times and assessed how trips might differ and who would experience those differences)
- Developing pedestrian and transit access improvements through South Downtown Hub and BLE planning process
- Exploring station and transfer path refinements to improve access and passenger experience
- Upcoming: Developing wayfinding and signage recommendations to improve system and station access legibility

# Ridership Modeling Background

- Ridership modeling provides potential scale and magnitude of system and station usage
- High volume of transit choices in the Seattle core makes modeling results highly sensitive to small changes, such as station access times
- Modeling does not predict individual behavior (e.g., people choose the travel choice that makes sense for them based on many different factors)

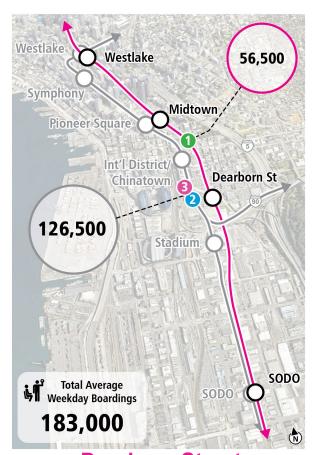


Example transit network in Ridership Model

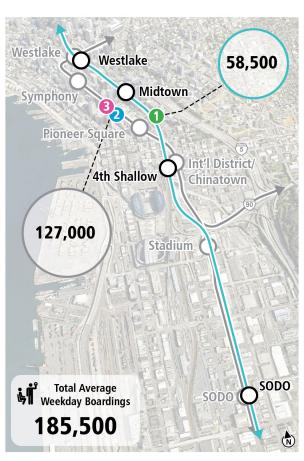
# Ridership modeling results: 2046

## Overall Link boardings between Westlake and SODO

Similar between alternatives



Dearborn Street
Preferred Alternative



4th Ave Shallow Alternative



5<sup>th</sup> Ave Shallow Diagonal Alternative

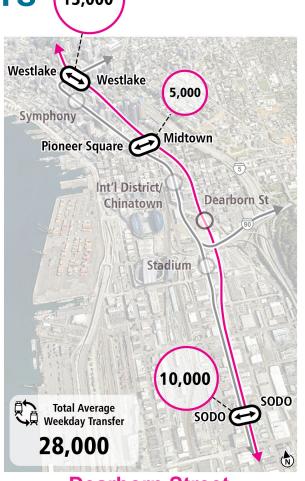


# Ridership modeling results: 2046

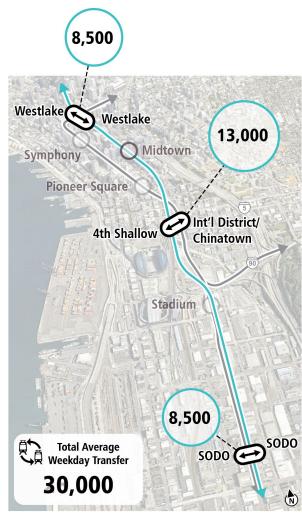
**Link-Link transfers** 

# Total average weekday transfers are similar between alternatives

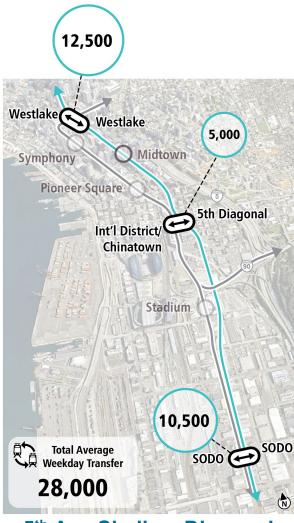
- More transfers at Westlake and SODO Stations with Dearborn Street Preferred and 5<sup>th</sup> Avenue Shallow Diagonal Alternatives
- More transfers at CID
   Station with 4th Avenue
   Shallow Alternative



**Dearborn Street Preferred Alternative** 



4th Ave Shallow Alternative



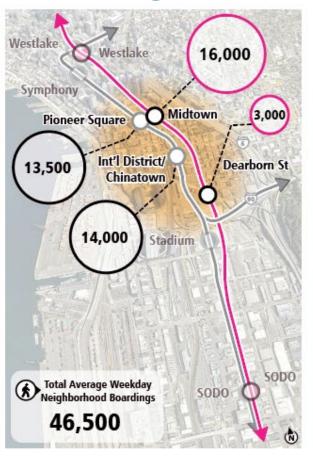
5<sup>th</sup> Ave Shallow Diagonal Alternative



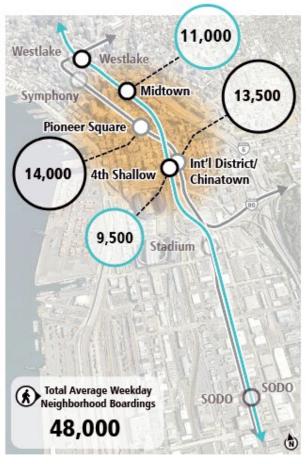
# Ridership modeling results: 2046

Neighborhood boardings for CID and Midtown Stations

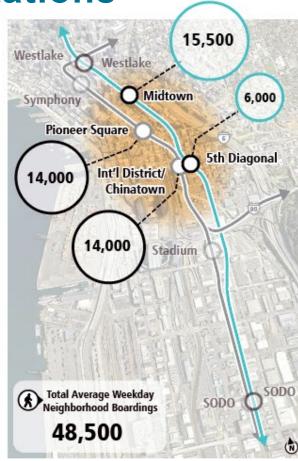
Similar between alternatives, with moderately higher boardings for 4th and 5th Avenue options (likely due to a shift in where boardings occur in central business district)



Dearborn Street
Preferred Alternative



4th Ave Shallow Alternative



5<sup>th</sup> Ave Shallow Diagonal Alternative



# Regional and Local Travel Times

	Dearborn Street (Preferred)	4th Ave Shallow*	5th Ave Shallow (Diagonal)			
Travel time between regional destinations (minutes):						
Hing Hay Park to SeaTac Airport	45	44	43			
CID Library to SeaTac Airport	47	53	52			
Danny Woo Garden to SeaTac Airport	52	48	47			
Occidental Square to SeaTac Airport	50	52	53			
Bellevue Transit Center to SeaTac Airport**	70	65	66			
Kent (Sounder) to South Lake Union	57	55	59			
SeaTac Airport to Harborview Medical Center	54	54***	54***			
SeaTac Airport to Swedish Hospital	63	59***	59***			

<sup>\*</sup> Assumes 4th Avenue Shallow configuration in CID. Shallower configuration would save approximately one minute.

<sup>\*\*\*</sup> Instead of walking or taking a King County Metro bus from Midtown Station, riders could also get off at the future station serving CID and take the Seattle Streetcar to Harborview Medical Center (68-69 minutes total) or Swedish Hospital (70-72 minutes total)



<sup>\*\*</sup> Riders could also take STRIDE BRT from Bellevue Transit Center to SeaTac Airport in 44-49 minutes.

## **Walk time to nearest 1-Line station\*:**

0-5 min

6-10 min

11+ min

	Dearborn Street (Preferred)	4th Ave Shallow	5th Ave Shallow (Diagonal)
Hing Hay Park	4 min	3 min	2 min
Little Saigon	15 min	13 min	12 min
Yesler Terrace	9 min	13 min	12 min
Occidental Square	6 min	8 min	9 min
Lumen Field	6 min	4 min	7 min
T-Mobile Park	10 min	11 min	14 min
Central Library	7 min	2 min	2 min
Seattle City Hall	2 min	2 min	2 min
Harborview	8 min	9 min	9 min
Virginia Mason	13 min	8 min	8 min
Frye Art Museum	9 min	8 min	8 min
Sounder Station	6 min	2 min	4 min
Amtrak Station	7 min	2 min	5 min
Colman Dock	10 min	8 min	8 min



## Overview

- □ Partnership of Sound Transit, City of Seattle, King County, and community towards an implementable plan.
- ☐ Through engagement series, working on visioning and prioritization of potential investments to streets and public spaces that help connect neighborhoods and regional transit modes.
- Builds upon and scales up past community-based plans and concurrent projects and planning initiatives.





# Where we are in the planning process

- Core Team of City and ST staff meet frequently to advance coordination and content, along with ongoing coordination with King County
- Community engagement on overall and focused concepts through Workshops 1 and 2, online survey and meetings with community groups
- Based on community feedback, currently advancing design and interagency coordination on concepts
- Planning an updated and expanded exhibition for Workshop 3 in March 2025, reporting back to community with refined designs

### November 2023

### February 2024

### July 2024

### March 2025

#### 2025 TBD

#### Open House

- Answer questions
- Community themes and project ideas

### Workshop 1

- Big picture visioning
- Develop overall concepts for community and station connections

### Workshop 2

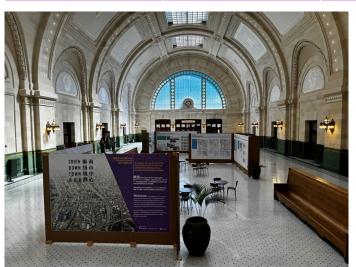
- Area-specific opportunities and issues
- Evaluate concepts for connections and places

### Workshop 3

- Report on refined concepts for specific areas
- Confirm concepts for connections and places

### Workshop 4

- Prioritize project concepts with costs
- Develop and endorse plan







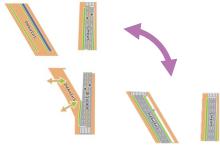
# Outreach and Engagement

- Nearly 1000 impressions made thus far in the planning process
- □ 15 in-person events held, including 3 large public events, and 12 meetings with community-based groups
- □ Online survey covering workshop 1 and 2 concepts held in summer 2024
- Exhibition covering planning background and Workshop 1 feedback launched in Union Station Great Hall in July 2024; will remain open and be updated in March 2025













150 attendees at kick-off open house

210 participants in workshops

170 participants in community meetings

463 completed first online survey

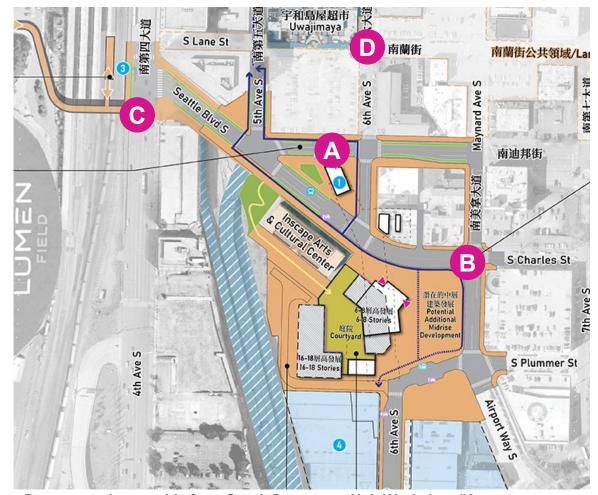


# Access to Stations:

Assessing different scenarios to improve access and mobility through South Downtown Hub\* and Non-Motorized Access Allowance.

## At CID Dearborn Street Station, includes:

- Narrowing and traffic calming Dearborn Street
- Realigning Seattle Boulevard
- New access to Sounder and across BNSF
- Accessibly pathways through corridor and spot improvements



Representative graphic from South Downtown Hub Workshop #2. Refinements in progress based on community feedback.

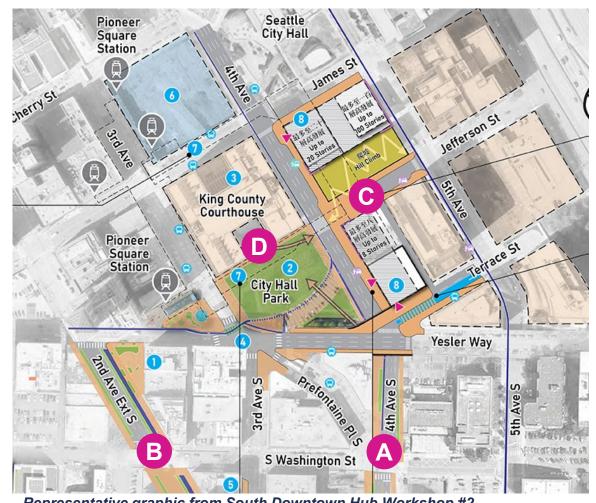


# Access to Stations:

Assessing different scenarios to improve access and mobility through South Downtown Hub\* and Non-Motorized Access Allowance.

## At **Midtown James Street Station**, includes:

- Corridor improvements along 4<sup>th</sup> Avenue
- **B** Major pedestrian improvements on 2<sup>nd</sup> Avenue Ext
- Pedestrian focus streets adjacent to station
- Integration with City Hall Park improvements



Representative graphic from South Downtown Hub Workshop #2. Refinements in progress based on community feedback.



# Access to Stations:

Assessing different scenarios to improve access and mobility through South Downtown Hub and Non-Motorized Access Allowance.

## Around **Union Station\*\***, includes:

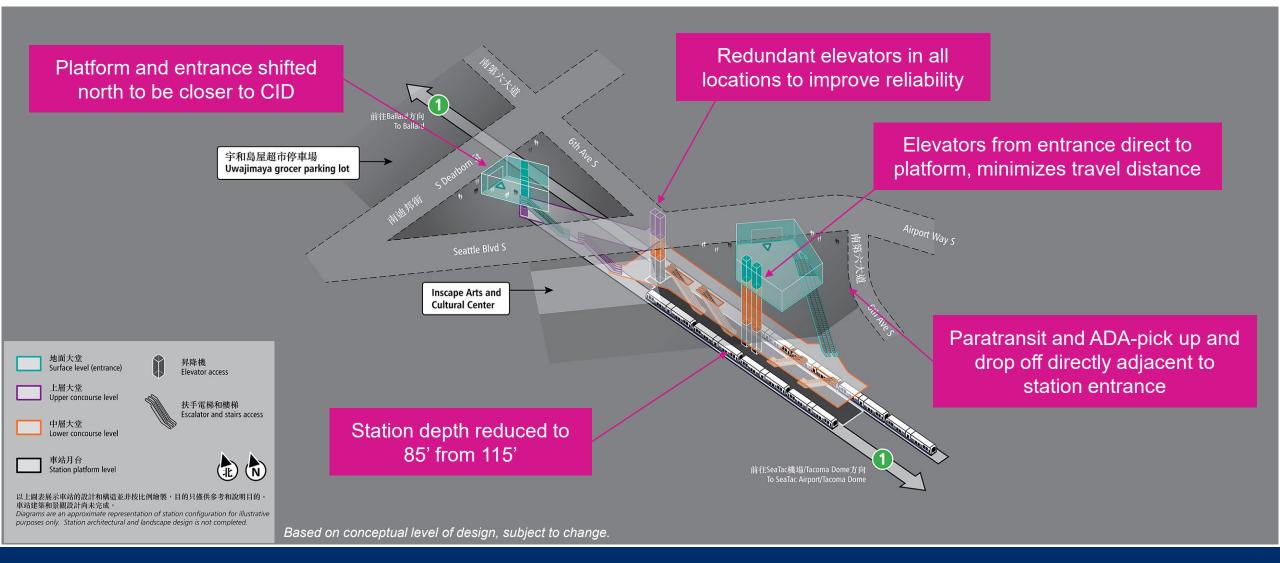
- A Major enhancements to 4th/2<sup>nd</sup>/Jackson intersection
- **B** Crossing improvements at 4<sup>th</sup> Avenue and King Street
- C Plaza improvements at existing Link station
- Pedestrian improvements along 5<sup>th</sup> Avenue



Representative graphic from South Downtown Hub Workshop #2. Refinements in progress based on community feedback.

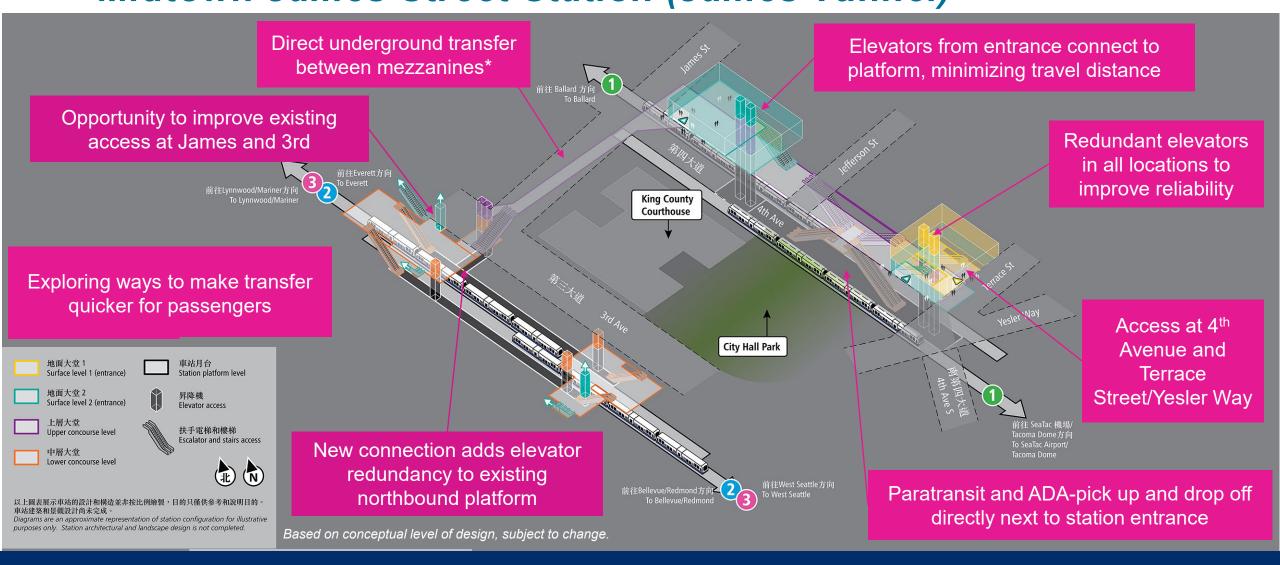


# Access in Stations CID Dearborn Street Station





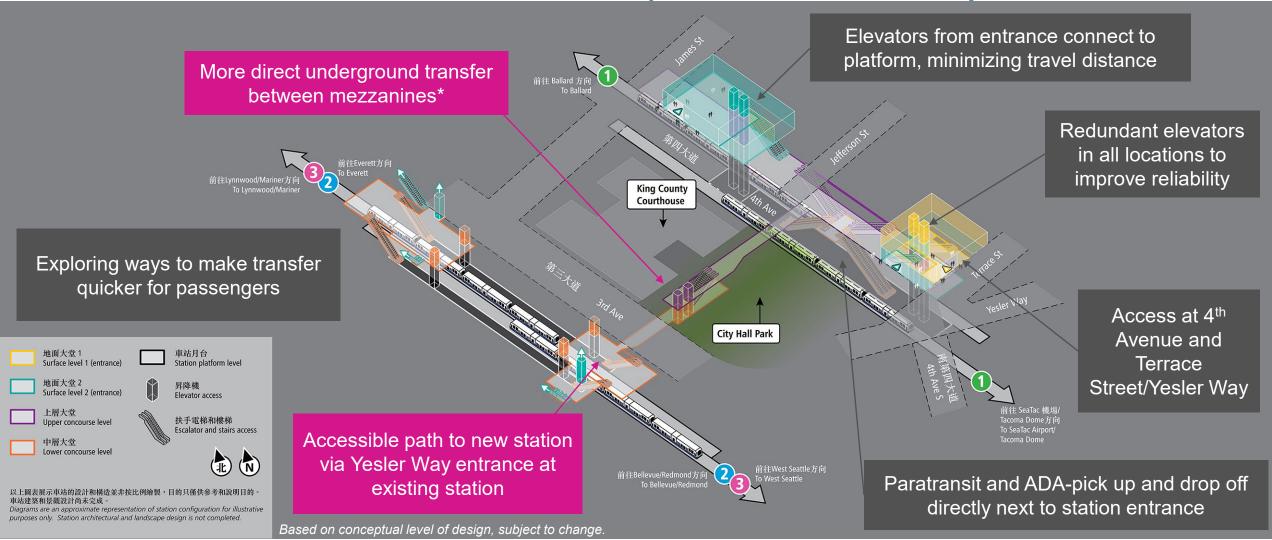
# Access in Stations Midtown James Street Station (James Tunnel)





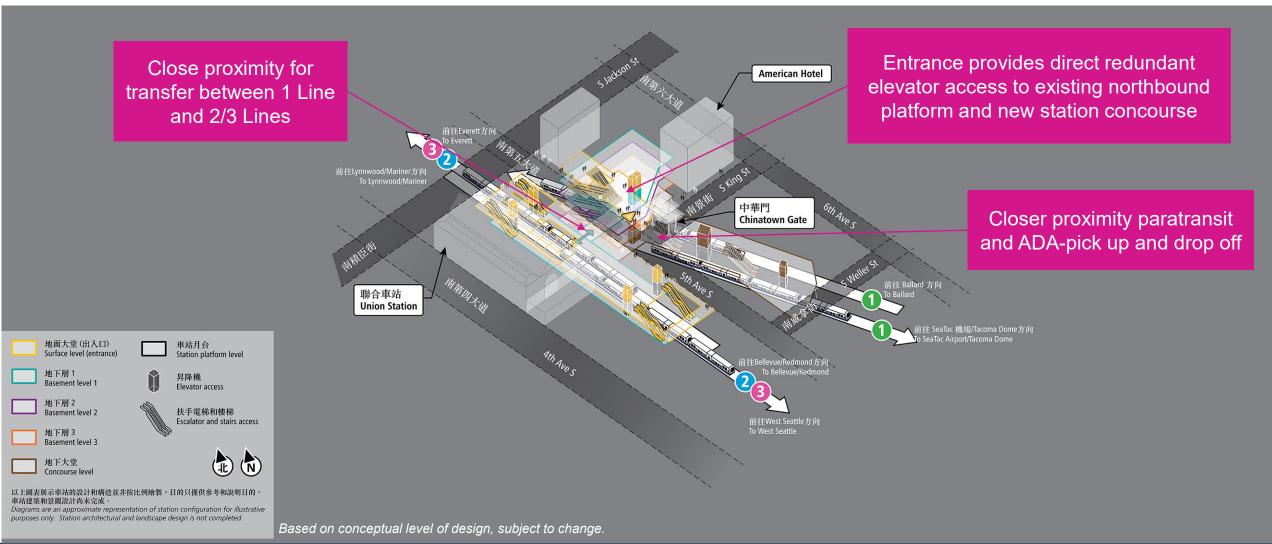
# Access in Stations

# Midtown James Street Station (Jefferson Tunnel)



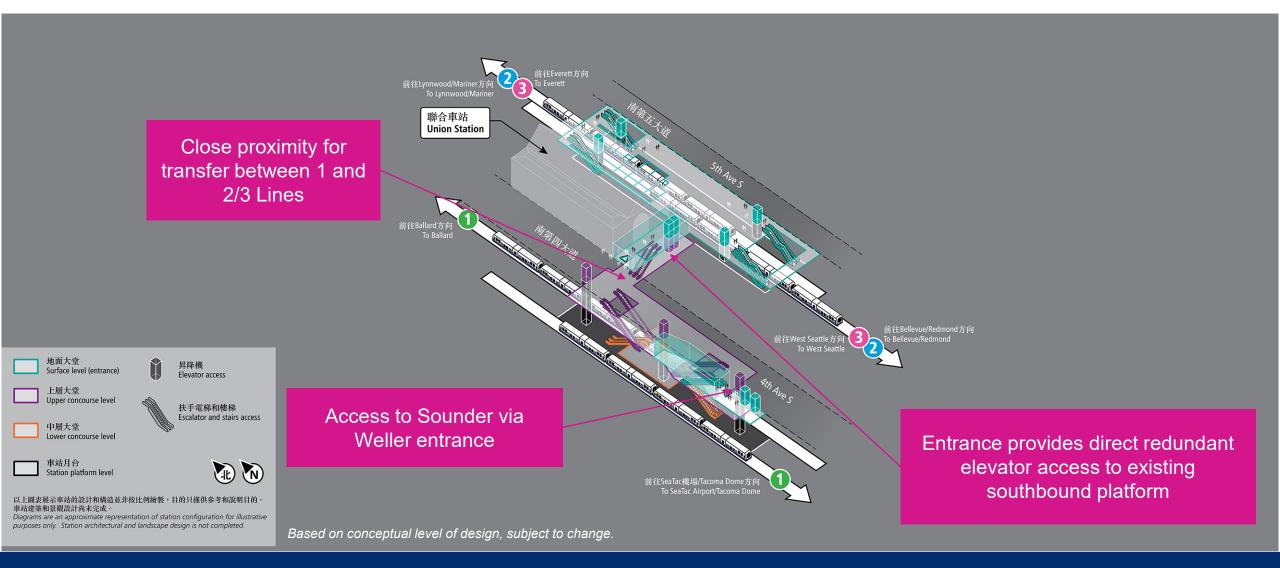


# Access in Stations CID 5th Avenue Shallow Diagonal





# Access in Stations CID 4th Avenue Shallow





# Discussion and Next Steps



2016



# PLANNING



2017-2023

## **Alternatives development**

- 2018: Early scoping
- **⊘** 2019: Scoping
- 2019: Board identifies preferred alternatives and other alternatives

## **Environmental review**

- 2022: Publish WSBLE Draft EIS
- 2023: Board confirms or modifies preferred alternatives

2024-2026

**Environmental review** 

Fall 2024: NEPA Scoping

2025: Publish BLE Draft EIS

Public comment period

Board confirms or modifies preferred alternatives

2026: Publish BLE Final EIS

Board selects project to be built

Federal Record of Decision



# Thank you



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