



NORTHGATE PEDESTRIAN AND BICYCLE BRIDGE

Monday, August 4, 2014

AGENDA

An aerial photograph of a city area, showing a mix of residential and commercial buildings, parking lots, and green spaces. A proposed transit line is overlaid on the image, starting from the left, running horizontally, and then curving upwards and to the right, ending near a large building complex. The line is represented by a thick black line with a grey fill, and it has several vertical lines extending downwards, possibly representing station locations or support structures.

A. Project Background

B. Level I Screening

C. Level II Screening

D. Summary and Next Steps



Justification / Purpose

This project will provide non-motorized improvements in the Northgate, North College Park and Licton Springs neighborhoods in the vicinity of Sound Transit's North Link Station and the North Seattle College.

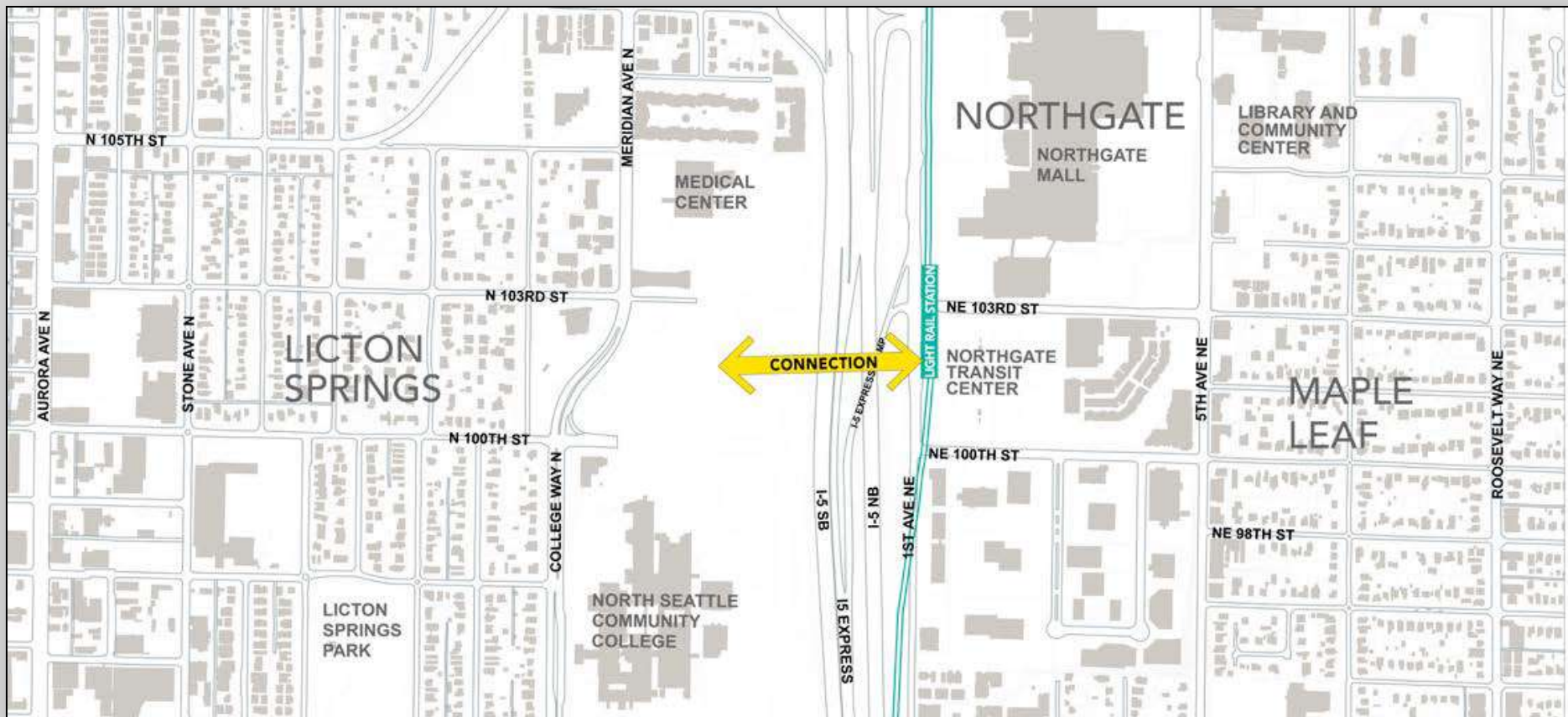
Improvements include:

- Pedestrian/bicycle overpass over I-5
- Connections of west and east neighborhoods/businesses
- Connection of integrated transit facilities with the bridge and separated bicycle facilities

Span I-5 Barrier:

- Connect neighborhoods
- Connect bicycle networks
- Connect businesses
- Connect higher education
- Connect light rail & transit hub

Justification / Purpose



Parameters

- Technical
- Financial
- Urban Design
- Environmental

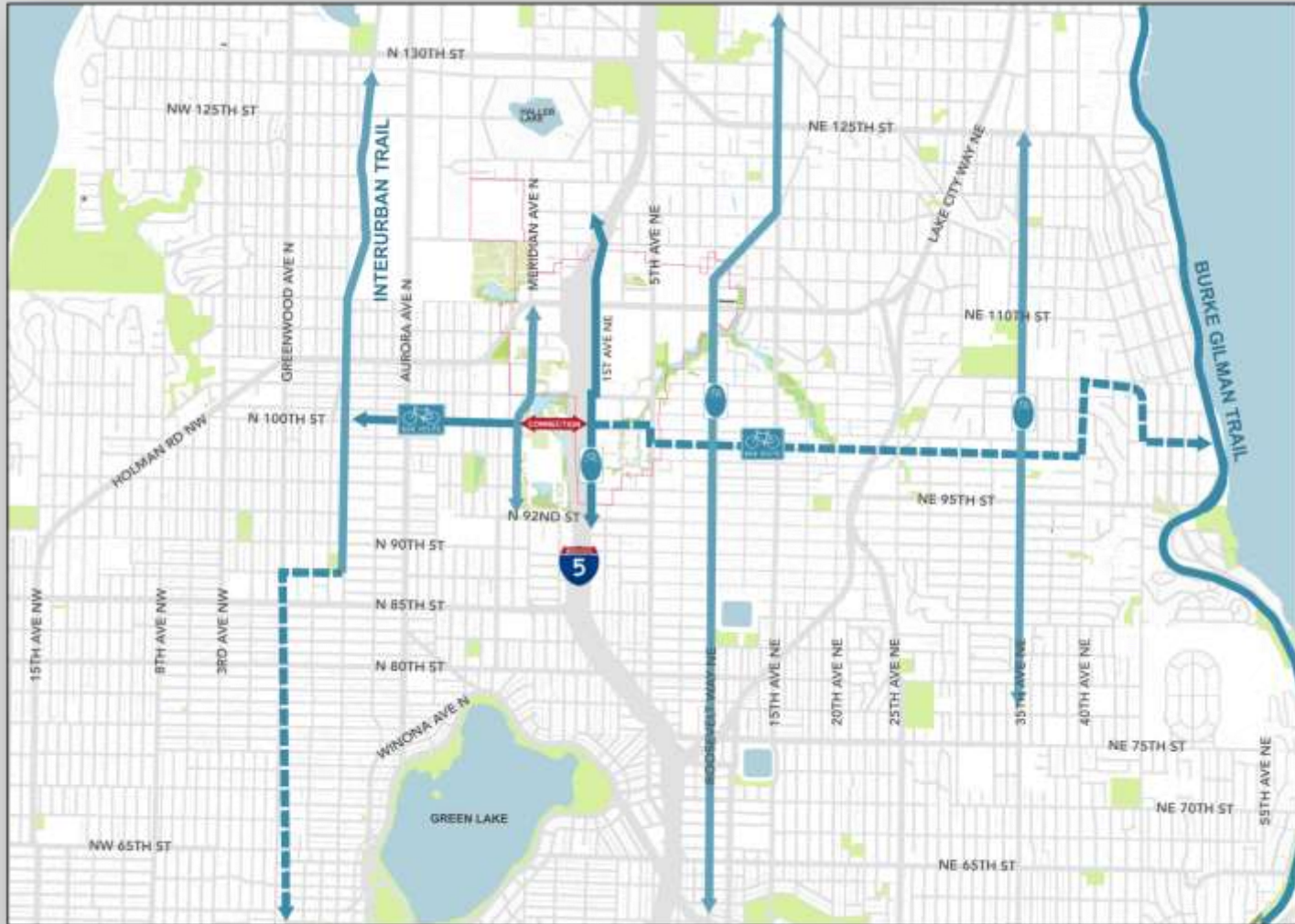
Goals

- Establish project boundaries
- Develop Connectivity
 - Key nodes
 - Alignments
- Bridge Types



Project Boundaries

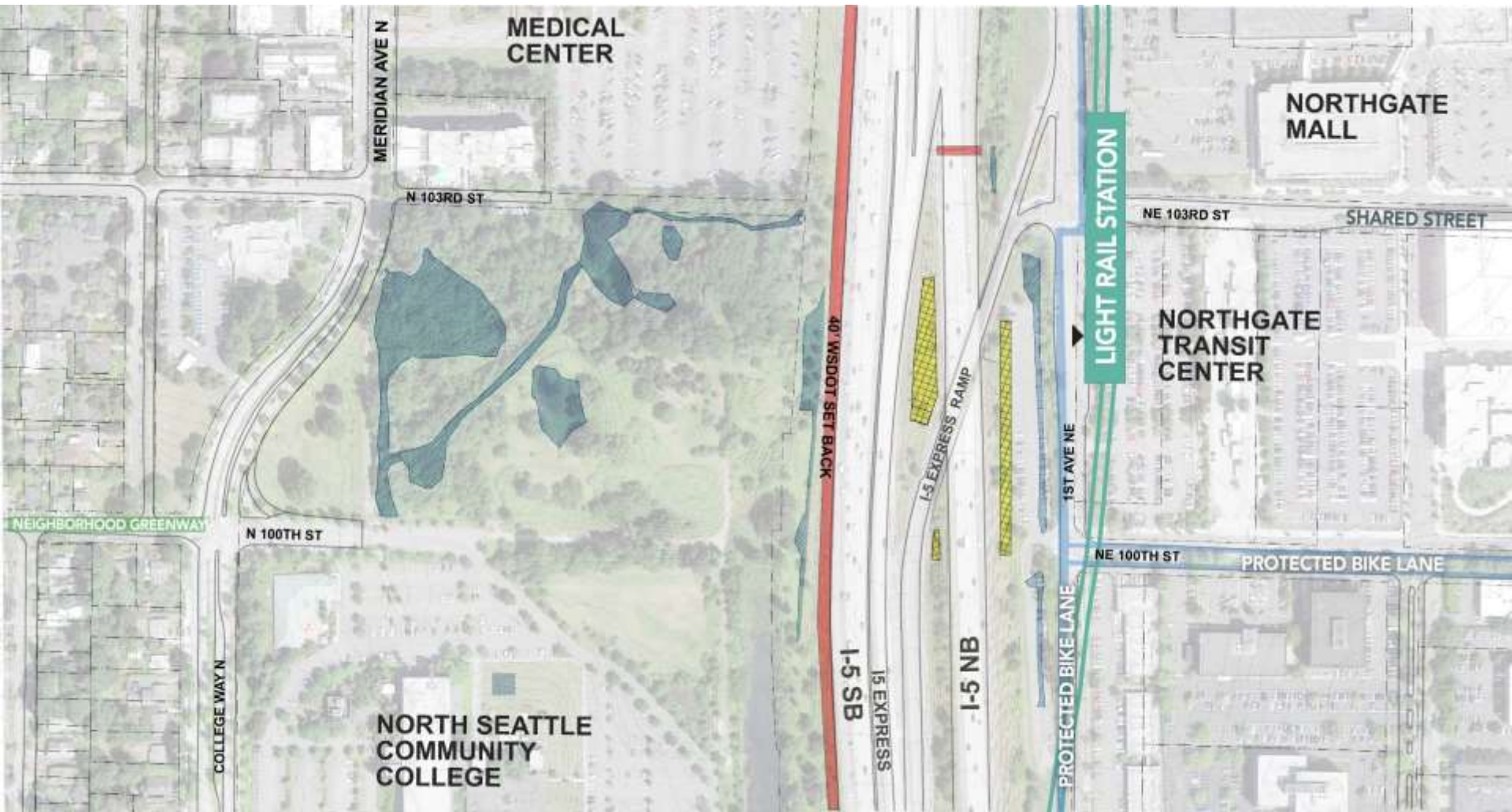
Project Boundaries



Project Boundaries



Existing Conditions



Existing Conditions: West Approach



Existing Conditions: I-5 Span



Existing Conditions: East Approach





Structural Types

Structural Types

Structural Type	Span Capability
Reinforced Concrete Girder	< 60ft
Reinforced Concrete Box	< 120ft
Prestressed Girder	< 200ft
Post-Tensioned I-Girder	< 250ft
Steel Girder	< 400ft
Arch	< 500ft
Post-Tensioned Concrete Box	< 700ft
Truss	< 1,200ft
Cable Stay	< 1,200ft

Screening Criteria

- Connectivity/Geometry
- Visual Impact/Presence
- Environmental Impact
- Safety
- Constructability
- Cost



Level II Screening

- **Connectivity/Geometry**

West Approach

- How well does it connect to:
 - » Licton Spring neighborhood
 - » North Seattle College
 - » Bicycle network
 - » Mass transit stops
 - » Pedestrian facilities



Level II Screening

- **Connectivity/Geometry**

East Approach

- How well does it connect to:
 - » Maple Leaf neighborhood
 - » Bicycle network/cycle track
 - » ST North Link Station
 - » King County transit centers
 - » Pedestrian facilities



Level II Screening

- **Connectivity/Geometry**

- I-5 Overcrossing

- Minimize structural depth
 - Minimize approach length
 - Conform to WSDOT requirements



Level II Screening

- **Visual Impact/Presence**

West/East Approaches

- Increase visibility and wayfinding from major transit, bicycle and pedestrian routes

I-5 Overcrossing

- Avoid distraction over I-5



Level II Screening

- **Environmental Impact**

Minimize wetlands impact

- Thornton Creek
- Bartonwood Sanctuary

Enhance cultural resources

- Bartonwood Sanctuary

Level II Screening

- **Safety**

- West Approach

- Maintain visibility from NSC and major public areas

- East Approach

- Maintain visibility from transit hub
 - Maintain visibility to surrounding motorized and non-motorized routes
 - Safety of interaction between motorized and non-motorized users

- Bridge

- Sight distance



Level II Screening

- **Constructability**
 - Construction access
 - Interruptions to traffic
 - Duration
- **Cost**
 - ROW acquisition cost
 - Maintenance and life-cycle costs
 - Construction cost

An aerial photograph showing a bridge structure crossing a body of water, with surrounding land and vegetation visible. The image is partially obscured by a dark red arrow-shaped graphic pointing to the right, which contains the text 'West Approach'.

West Approach

West Approach



West Approach Summary

Screen Criteria	W1 N 103rd St		W2 N 100th St	
Connectivity	▼	<ul style="list-style-type: none"> Does not connect with major transportation or circulation routes Does not connect with trail system 	▲ ▲	<ul style="list-style-type: none"> Adjacent to the N 100th St bicycle network NSC preferred
Visual Presence/Impact	▼ ▼	<ul style="list-style-type: none"> Not visible from major circulation routes Associated alignments obstructs existing I-5 exit sign 	▲	<ul style="list-style-type: none"> Visible from NSC and 100th St
Environment Impact	▼	<ul style="list-style-type: none"> Impacts to identified natural preserve and cultural resources 	▲	<ul style="list-style-type: none"> Located outside of wetland area and in area with less vegetation Ability to enhance the awareness of cultural resources
Safety	▼ ▼	<ul style="list-style-type: none"> Limited visibility and deposits users in private parking lot concealed by trees 	▲ ▲	<ul style="list-style-type: none"> Visible from NSC and major street connection
Constructability	▼	<ul style="list-style-type: none"> Located inside of wetland area Associated alignments require cost to move I-5 exit sign 	▲	<ul style="list-style-type: none"> Outside of wetland area in area with less vegetation Adjacent to maintenance access road.
Cost	▼	<ul style="list-style-type: none"> Located inside of wetland area Requires substantial trail improvements/mitigation 	▲	<ul style="list-style-type: none"> Located outside of wetland area Integrates existing trail system

East Approach



East Approach



East Approach



East Approach



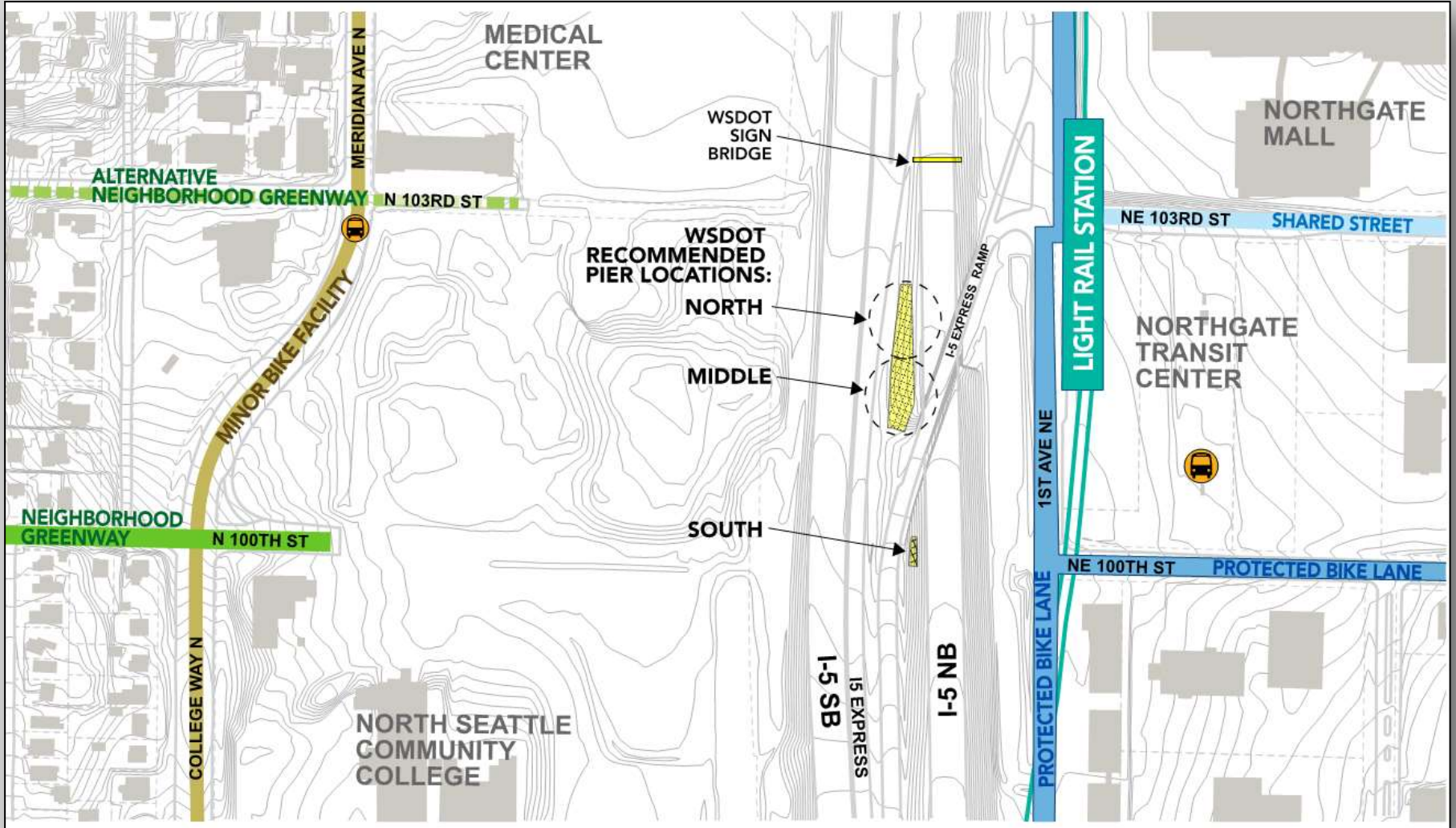
East Approach Summary

Screen Criteria	E1 NE 103rd St		E2 Mid Parking Lot		E3 NE 100th St	
Connectivity	▼	➤ Confusing, congested intersection	▼ ▼	➤ Not at an intersection	▲ ▲	➤ Connects to primary bicycle network on NE 100th and 1st Ave Cycle Track ➤ Sets up ideal ramping connection into ST station
Visual Presence/Impact	▼	➤ Not connected to proposed bicycle network at NE 100th St ➤ Associated alignments require relocation of existing I-5 exit sign	▼ ▼	➤ Not immediately visible from NE 100th St or NE 103rd St	▲ ▲	➤ Easily seen from primary pedestrian route of NE 100th St
Environment Impact	▼	➤ Located in wetland area	■	➤	■	➤
Safety	▼ ▼	➤ Too many traffic movements at intersection, unsafe.	▼ ▼	➤ Deposits users in the middle of the parking lot	▲	➤ High visibility at multimodal transportation intersection
Constructability	▼	➤ Located in wetland area	■	➤	■	➤
Cost	▼ ▼	➤ Located in wetland area, mitigation ➤ Associated alignments require relocation of existing I-5 exit sign	■	➤ Potentially sets up longer ST Station connection	■	➤



I – 5 Crossing

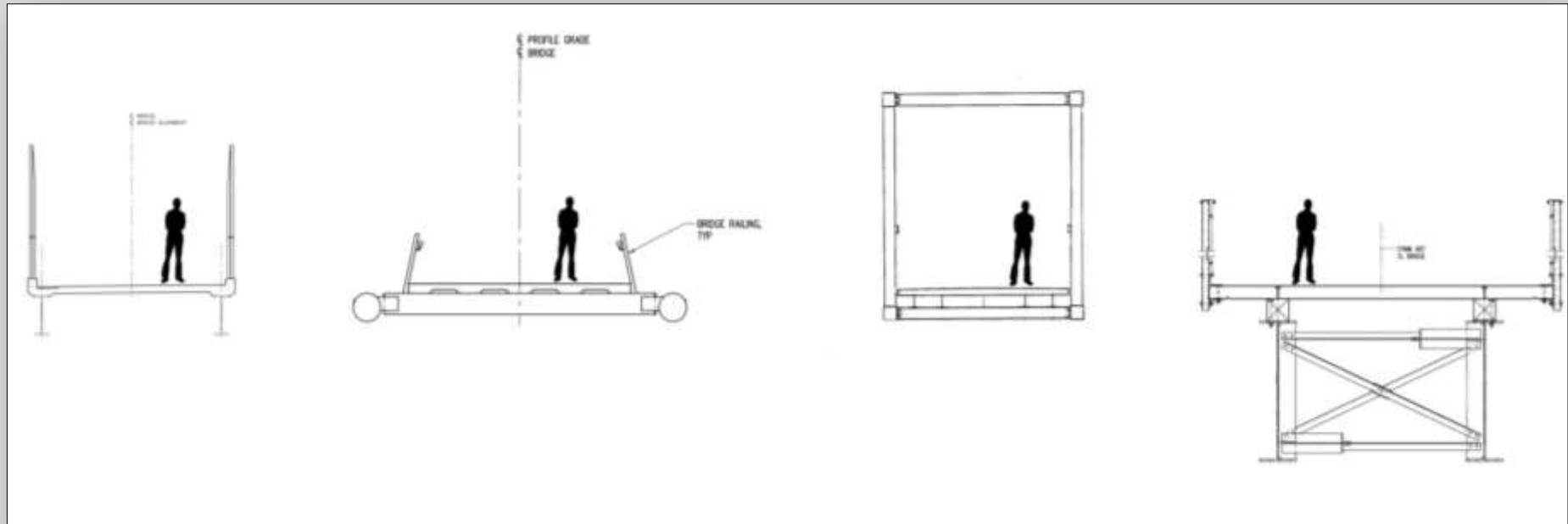
I - 5 Crossing



Structural Depth

Structural Type	Span Capability
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Structural Depth



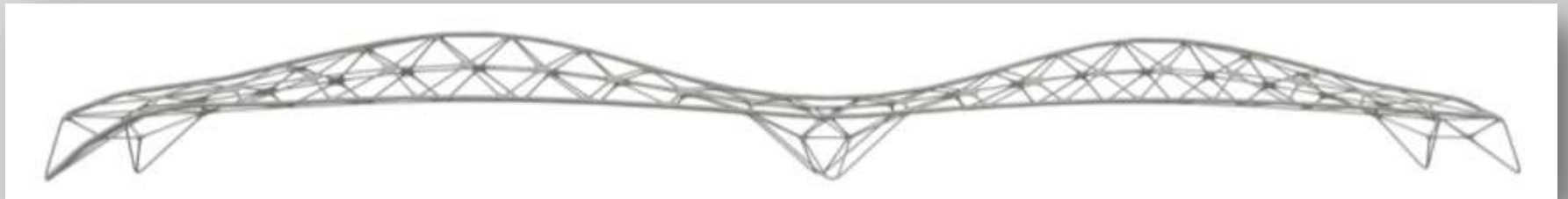
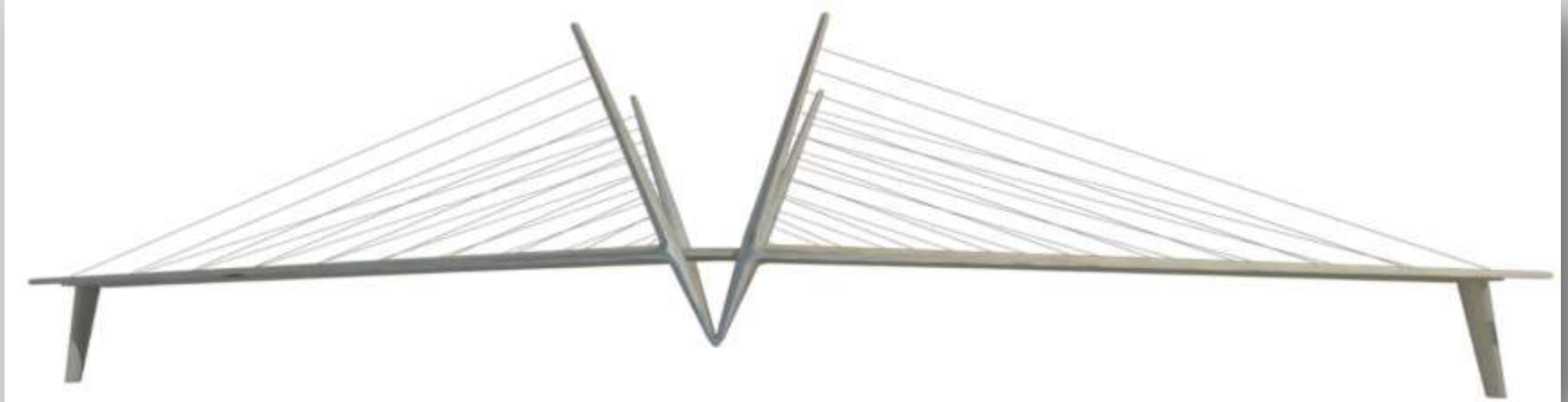
Depth vs. Length/Time

Structural Type	Structural Depth	ADA Ramp Length*		Travel Time**
		East	West	
Girder Bridge	8ft-10ft	1,225ft	1,175ft	10.5 minutes
Arch Bridge	2.5-3.5ft	900ft	850ft	8 minutes
Truss Bridge	2.5-3.5ft	900ft	850ft	8 minutes
Cable-Stayed Bridge	2.5-3.5ft	900ft	850ft	8 minutes

* Approximate length of ramps using 2% slope. Length may vary based on final alignment.

** Travel time based on pedestrian speed of 3mph, and includes 400ft of main bridge span length

I-5 Crossing Bridge Types



I-5 Crossing: Cable-Stay



VIEW FROM NORTHEAST

I-5 Crossing: Cable-Stay



VIEW FROM NE 100TH ST AND 1ST AVE N.

I-5 Crossing: Arch



VIEW FROM NORTHEAST

I-5 Crossing: Arch



VIEW FROM NE 100TH ST AND 1ST AVE N.

I-5 Crossing: Tube/Truss



VIEW FROM NORTHEAST

I-5 Crossing: Tube/Truss



VIEW FROM NE 100TH ST AND 1ST AVE N.

I-5 Crossing – Summary

Screen Criteria	Arch		Tube		Cable-stayed	
Geometrics	▲	➤ Thin structural depth	▲	<ul style="list-style-type: none"> ➤ Integration of throw barrier into structural system ➤ Could create an integrated barrier to noise and wind over I-5 	▲	➤ Thin structural depth
Visual Presence/Impact	▲	➤ Minimal visual distraction from the perspective of WSDOT	▲	➤ Minimal visual distraction from the WSDOT perspective	▼	➤ WSDOT concerns with visual distraction
Environment Impact	■	➤	▲	➤ Internal lighting able to be contained within structure	▲	➤ Smaller foundation area at the bridge abutments
Safety	▲	➤ Open structure provides visibility from multiple angles	▲ ▲	➤ Opportunity for creating an integrated barrier to noise and wind over I-5	▲	➤ Open structure provides visibility from multiple angles
Constructability	▲	➤ Capable of being delivered to site in large pieces	▲ ▲	➤ Capable of being delivered to site in large pieces then assembled and lifted into place	▼	<ul style="list-style-type: none"> ➤ Large foundation in center of I-5 ➤ Challenging construction sequencing requires more I-5 interruptions
Cost	■	➤ Options within budget	■	➤ Options within budget	■	➤ Options within budget

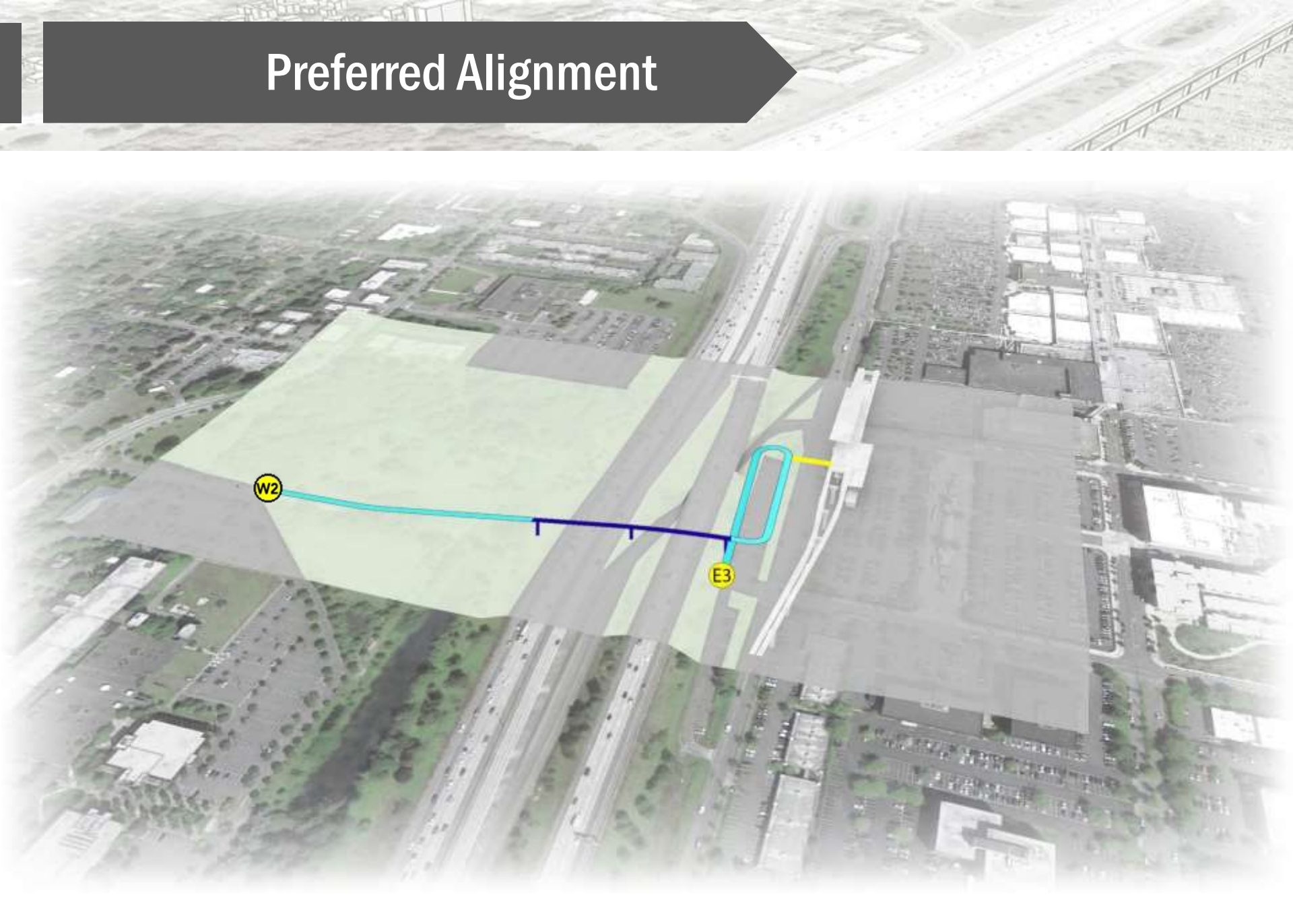
Level II Screening Summary

Screen Criteria	W2 N 100th St
Connectivity	▲ ▲
Visual Presence/Impact	▲
Environment Impact	▲
Safety	▲ ▲
Constructability	▲
Cost	▲

E3 NE 100th St
▲ ▲
▲ ▲
■
▲
■
■

Arch	Tube
▲	▲
▲	▲
■	▲
▲	▲ ▲
▲	▲ ▲
■	■

Preferred Alignment



Preferred Alignment



Northgate Pedestrian and Bicycle Bridge

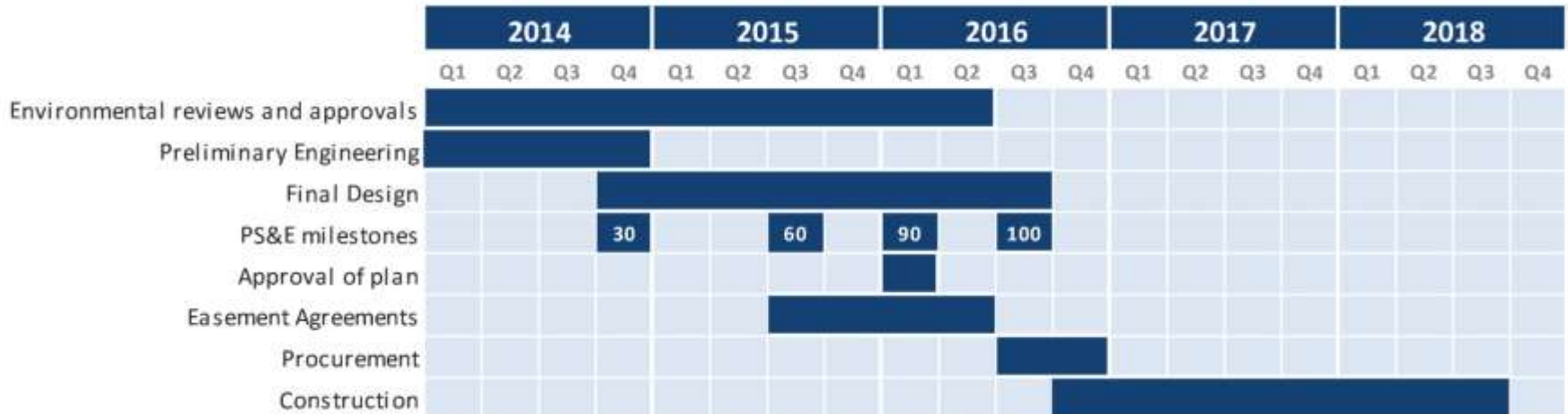
Preferred Alignment



Northgate Pedestrian and Bicycle Bridge

Next Steps

PROJECT SCHEDULE



Next Steps

- Design Commission Presentation, Thursday August 7
- Draft Alternative Analysis and Evaluation Report
- Screening Level III – Preferred Alternative