

## 05 GEOGRAPHICAL SUBAREAS

“Seattle possesses extraordinary landscape advantages in having a great abundance and variety of water views and views of wooded hills and distant mountains and snow-capped peaks.”

Report to Seattle Park Commissioners,

John Charles Olmsted, 1903

# GEOGRAPHICAL AREA STUDIES

## Introduction

Geographical area studies focus on the individual areas and subareas that were explored during the SCDP and are informed by the project vision and principles. The geographical areas and their subareas are identified in the Geographical Areas Key Map on the opposite page. Within each subarea, the document provides a summary of public feedback, design opportunities and issues that were explored and design preferences that have been identified.

The project vision and principles play a key role in helping to shape the design exploration and decision making that inform the design preferences. The principles of Expression, Sustainability and Utility are realized in efforts to provide: graceful entries and scaled architectural features (expression); reduction of concrete and increased tree canopy cover (sustainability); and multilayered functionality and reduced construction impacts (utility). The SR 520 project integrates these three principles by:

### Expression

- Incorporating the blue-green natural environment into project designs
- Addressing the needs of users
- Reflecting community preferences

### Sustainability

- Increasing transit and HOV access
- Augmenting the regional bicycle and pedestrian network
- Helping complete the Olmsted vision of connected parks, greenways and boulevards
- Improving public access to Lake Washington and Portage Bay shorelines
- Creating naturalistic wetlands for stormwater to collect, treat and return runoff to the natural environment

### Utility

- Maximizing functionality, as well as number of functions, in each subarea

## Vision Key Map



### Improving an Urban Axis

Montlake Boulevard East connects two major activity centers: the University of Washington and downtown Seattle, with opportunities to work with partners to enhance the quality of experiences, safety and efficiency of mobility, and the vibrancy of diverse neighborhoods.

### Integrating an Historic Boulevard

Montlake Boulevard East and East Lake Washington Boulevard are the historic footprint of the Olmsted brothers' parks and green boulevard multimodal network, providing a variety of users a sense of journey and arrival.

### Enhancing the Natural Blue-Green Axis Along the Corridor

The SR 520 project connects lakes, marshes, bays, shorelines, urban forests and open spaces.

### Identifying Gateways of Seattle

The SR 520 project provides a series of major and minor natural and built "gateways," or defined entries, entering and leaving Seattle: bridges, forests, bays, and lid portals.

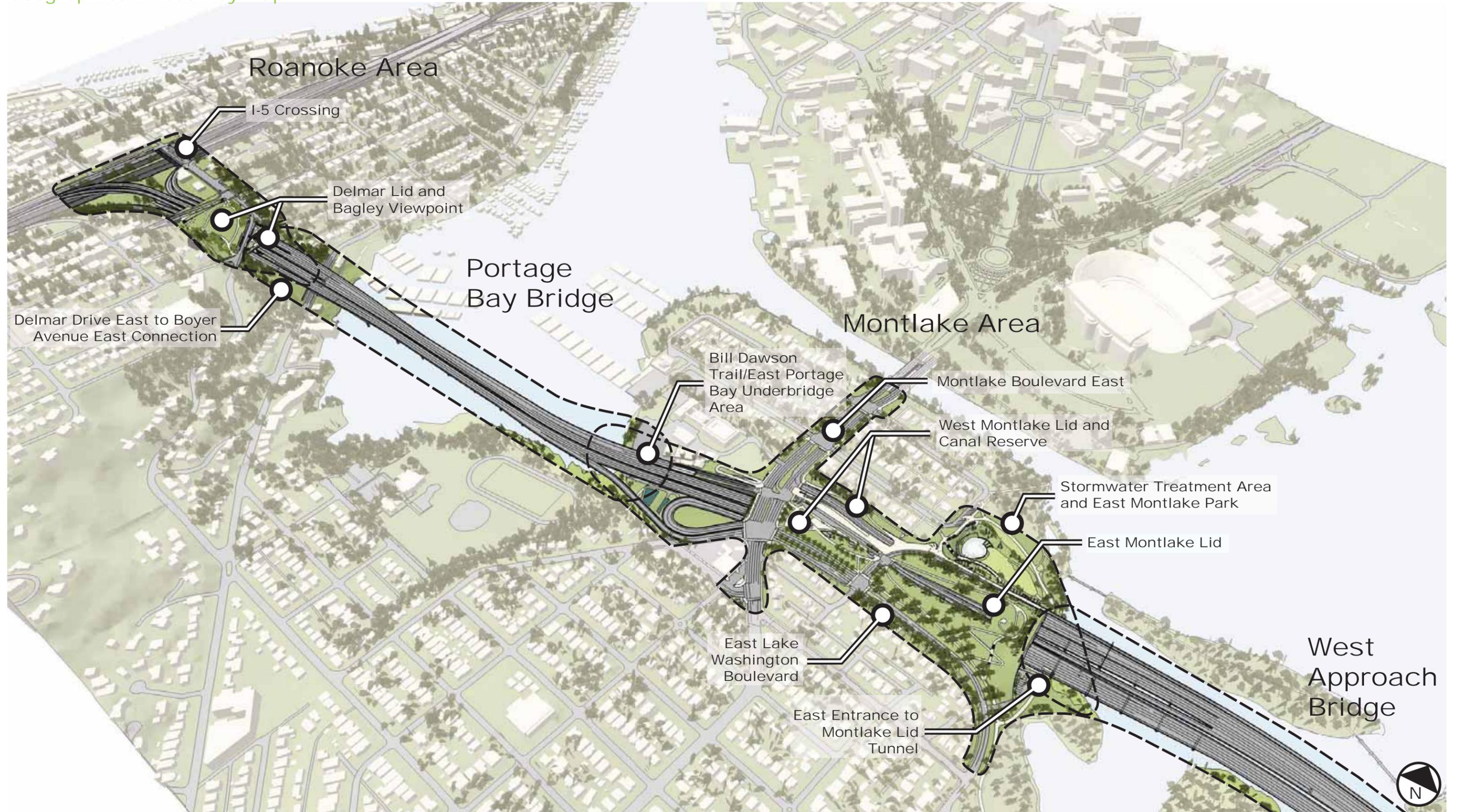
As shown in the *Vision Key Map* above, integrating the vision of "Nature meets city" is realized in four critical ways:

- Enhancing the natural blue-green axis along the corridor
- Integrating Montlake Boulevard East, the west end of the Montlake lid, and East Lake Washington Boulevard into a parkway that extends to the Washington Park Arboretum and honors the historic footprint
- Improving the north-south urban axis that extends along Montlake Boulevard up along 23rd Avenue into Capitol Hill

- Identifying the individual gateway opportunities for the SR 520 to and from the City of Seattle

The WSDOT team will continue to refine the design preferences as the project moves forward. As such, not all aspects of the design principles are addressed in this report. For example, the scale and architectural style of the portal entries to the lids have not yet been determined.

Geographical Areas Key Map

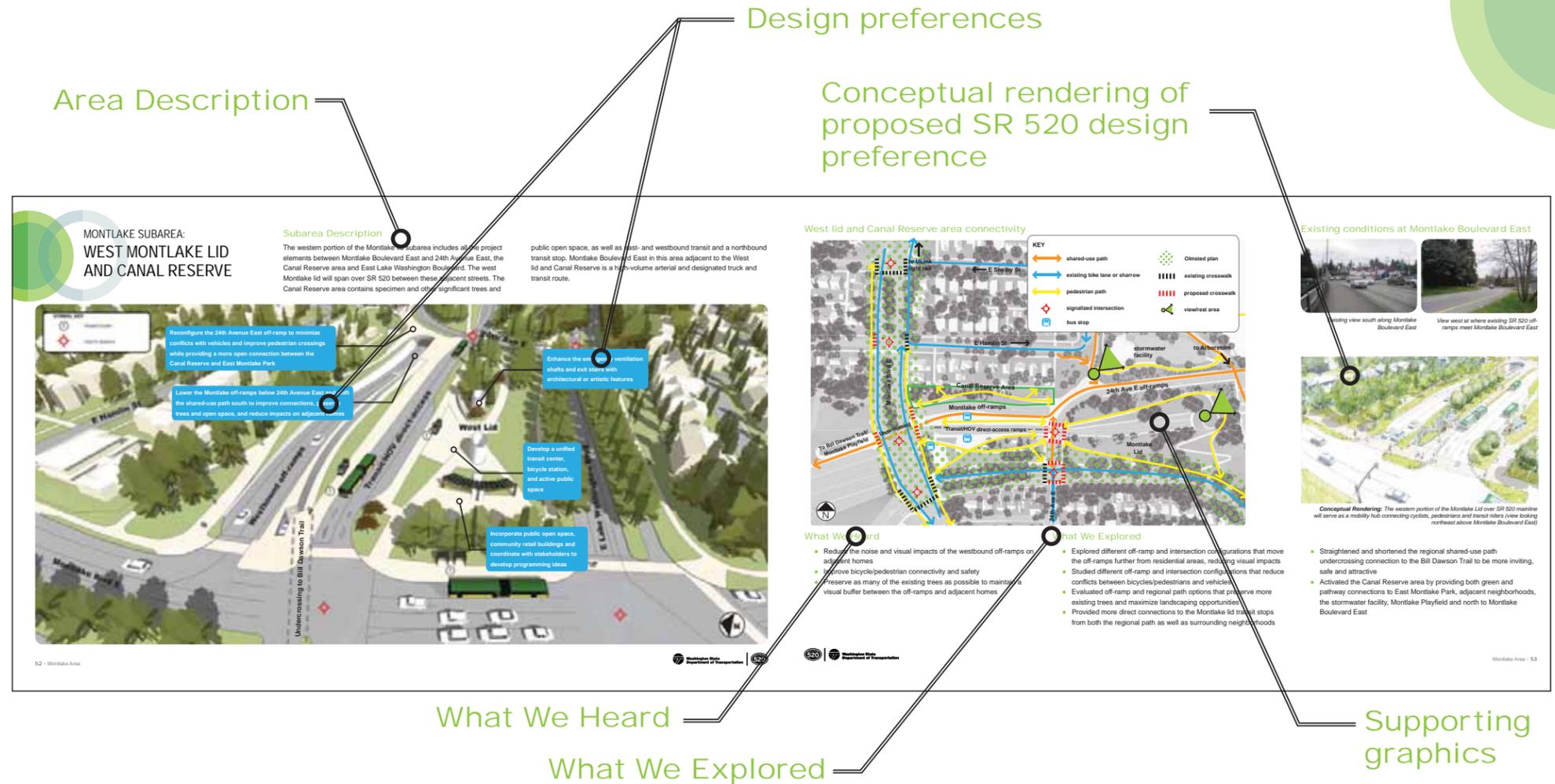


# HOW TO USE THIS SECTION

The following documents the content and feedback of the iterative and inclusive design process of the past year that comprised the Seattle Community Design Process (SCDP). The SCDP was a series of seven public workshops and ongoing conversations with design professionals, contributing agencies and public stakeholders.

Study areas were identified within the SR 520 project based upon neighborhood boundaries and topography. Four geographical areas emerged: the Roanoke Area, Portage Bay Bridge, the Montlake Area and West Approach Bridge.

Each section presents an overview of the geographical areas and provides a detailed examination of the issues, ideas and design responses for each subarea. Four levels of information are provided in each section: Area/Subarea Description, What We Heard, What We Explored and Design Preferences.



## Definitions

Area Description provides an overview of the existing geographical parameters of the area or subarea and relevant design issues such as traffic, views, noise and connections that were addressed by the baseline design.

What We Heard summarizes key public and cooperating agency feedback from six public workshops and numerous presentations. A full record of public feedback is available online at: [www.wsdot.wa.gov/Projects/SR520Bridge/I5ToMedina/scdp.htm](http://www.wsdot.wa.gov/Projects/SR520Bridge/I5ToMedina/scdp.htm)

What We Explored details the design opportunities identified as well as preliminary design team responses to public and agency feedback, providing urban and engineering design options explored in response to diverse stakeholder input

Design Preferences documents refinements of the design opportunities explored and provides options and/or solutions that offer the best overall approach based on a synthesis of four key perspectives:

- Input received from agency partners, advocacy groups and the public at large
- Insights gained from a series of internal WSDOT workshops regarding sustainable transportation design and construction
- The suggestions from an Expert Review Panel (ERP) that comprised North American experts on urban design, water resources management and sustainability
- The overall experience and judgment of the WSDOT design team

# ROANOKE AREA

## Area Description

The Roanoke area comprises three subareas: the I-5 Crossing, the 10th and Delmar lid and Bagley Viewpoint, and the Delmar Drive East to Boyer Avenue East pedestrian connection. The area is characterized by both residential and commercial communities, including the nationally designated Roanoke Park Historic District and North Capitol Hill. Set on a high ridge, the area has panoramic views from Bagley Viewpoint to the east of Portage Bay, the University of Washington, Lake Washington and the Cascade Mountains; and from the 10th Avenue East bridge and the I-5 Crossing to the west of the Olympic Mountains, downtown Seattle and Lake Union. Three busy streets converge where the new lid will be located: 10th Avenue East, East Roanoke Street and Delmar Drive East. Steep grades act as both opportunities for exercise and views, while at the same time presenting obstacles to mobility for some users. The area also has two schools: The Option Program at Seward (TOPS) School and Seattle Preparatory High School.

Roanoke Park and Interlaken Park are important components of the Olmsted brothers' historic parks and green boulevards plan. The SR 520 project has the opportunity to enhance and reconnect these green spaces with the 10th and Delmar lid and by providing safe and memorable connections to Portage Bay and Lake Union.

## Roanoke Subareas



Refined baseline design with Design Preferences based on community input (July 2012)

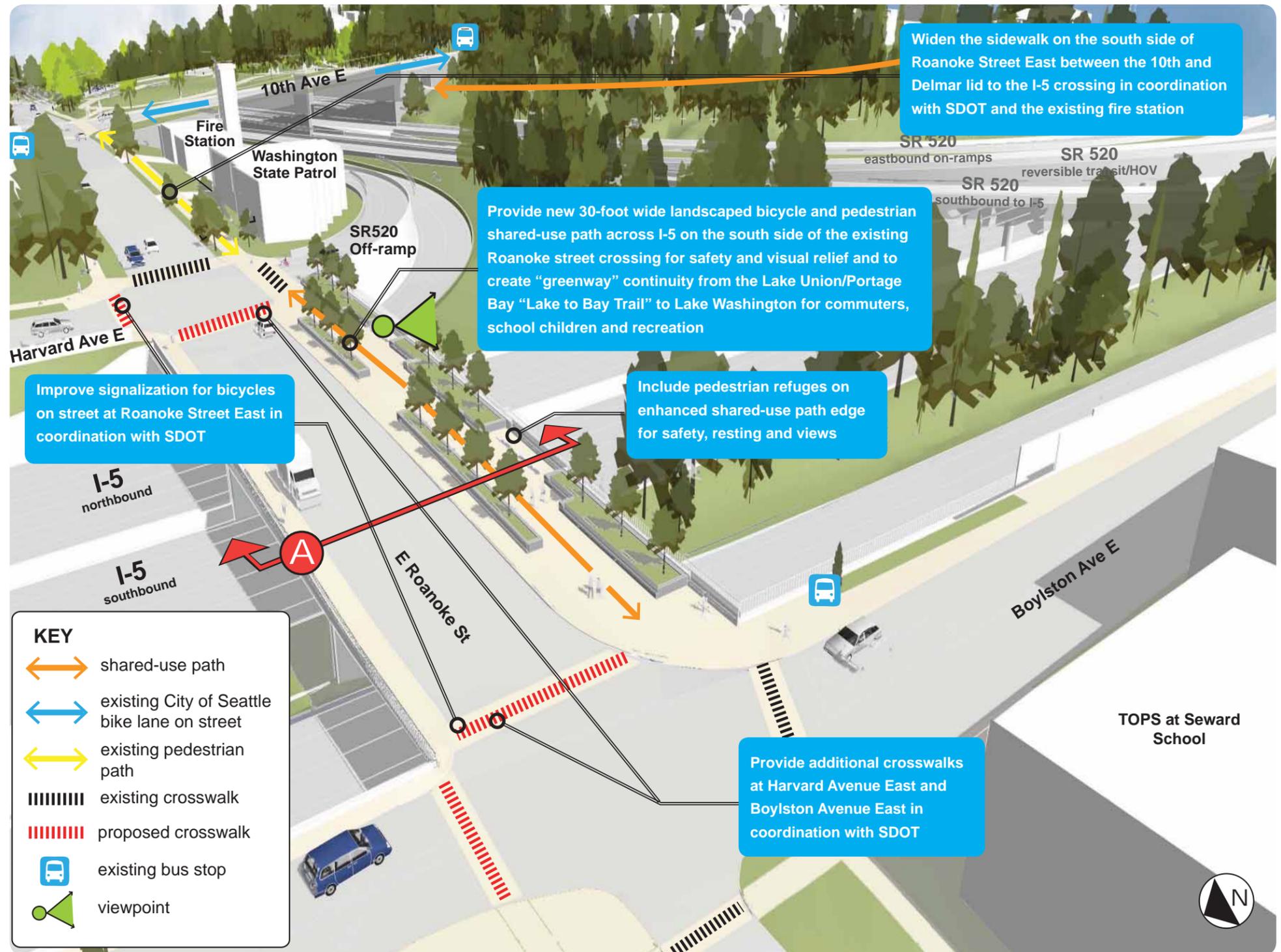


# ROANOKE SUBAREA: I-5 CROSSING

## Subarea Description

The I-5 crossing subarea is located on East Roanoke Street between Boylston Avenue East and Harvard Avenue East. The existing substandard sidewalks are heavily used by surrounding neighbors to access Lake Union, Portage Bay and the Montlake Playfield, as well as area schools and transit access to Capitol Hill, University of Washington and downtown. Heavy on- and off-ramp traffic at East Roanoke Street presents a challenge to pedestrians and cyclists because of poor sight lines and vehicle-only signalization. The baseline design proposes a new 30-foot wide bridge structure with landscape planting on the south side of the existing bridge.

## Design Preferences



## Section viewing east



## What We Heard

- Support for enhanced green connection across I-5 that provides a safer, more pleasant connection for cyclists, pedestrians and transit users
- Desire for additional crosswalks and pedestrian signals
- Concern for safety of children walking to and from The Option Program at Seward (TOPS) School and Seattle Preparatory High School

## What We Explored

- Evaluated opportunities for integrating landscape with a shared-use bicycle and pedestrian path on a new structure on the south side of the existing Roanoke Street East I-5 crossing
- Identified potential locations for new crosswalks and safety improvements to existing crosswalks in collaboration with SDOT
- Developed ideas for better separating on-street bicycle lanes from vehicles on East Roanoke Street, including a separate bicycle path structure



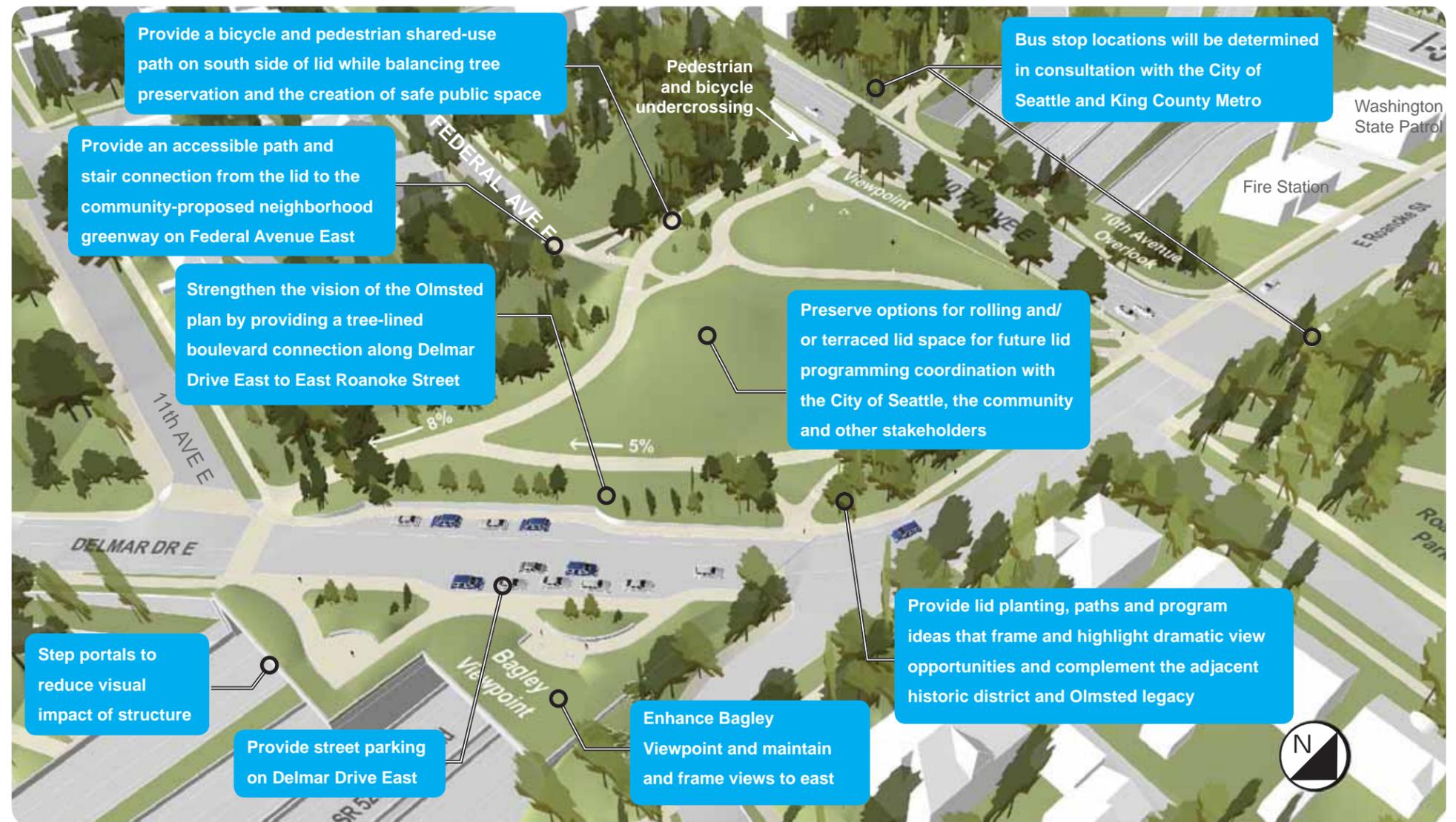
**Conceptual Rendering:** A new landscaped pedestrian and bicycle connection across I-5 on the south side of East Roanoke Street will improve user experience and increase safety (view facing west)

# ROANOKE SUBAREA: 10th AND DELMAR LID AND BAGLEY VIEWPOINT

## Subarea Description

This subarea is located in the heart of the Roanoke Historic District. The proposed lid will be constructed over what currently is airspace above the SR 520 highway and will reconnect neighborhoods across the roadway from 10th Avenue East to Delmar Drive East. The lid will span north to south from Roanoke Street East to the Federal Avenue East street end. The resulting lid area will slope down in a gently rolling grade from a high spot at the southwest corner at 10th Avenue East to the intersection of Delmar Drive East and 11th Avenue East.

## Design Preferences





Conceptual Rendering: View from 10th Avenue East looking east



Conceptual Rendering: View from 10th Avenue East and East Roanoke Street looking southeast



Conceptual Rendering: View from Federal Avenue East looking north

## Roanoke Area connectivity diagram



KEY			
	shared-use path		Olmsted plan
	existing bike lane or sharrow		existing crosswalk
	pedestrian path		proposed crosswalk
	community requested shared-use path		view/rest area
	signalized intersection		bus stop

## What We Heard

- Provide safe and convenient regional and local shared-use path connections through the area
- Carefully locate bus stops where they can best serve primary users
- Create opportunities for viewing from the lid, keep heavy planting to the sides to frame views, and provide a contrasting sunny area
- Provide for a primarily passive open space on the lid with the possibility of some active, small-scale recreational uses
- Create good paths and visual sight lines across the lid to provide views and connections
- Blend the lid into the hillside to the south
- Remove off-street parking by Bagley Viewpoint and include a minimum number of on-street parking stalls on Delmar Drive East to reduce amount of pavement and visual impacts
- Ensure that the enhanced Bagley Viewpoint is green and that views are framed and otherwise unobstructed by trees or structures
- Provide easy access to the lid to encourage community ownership, safety and usability
- Maintain privacy for neighborhoods
- Create a T-intersection at 10th Avenue East and Roanoke Street East
- Explore the opportunity for visual continuity and physical connection of the new lid space to the existing Roanoke Park
- Maximize tree preservation in the lid area

## What We Explored

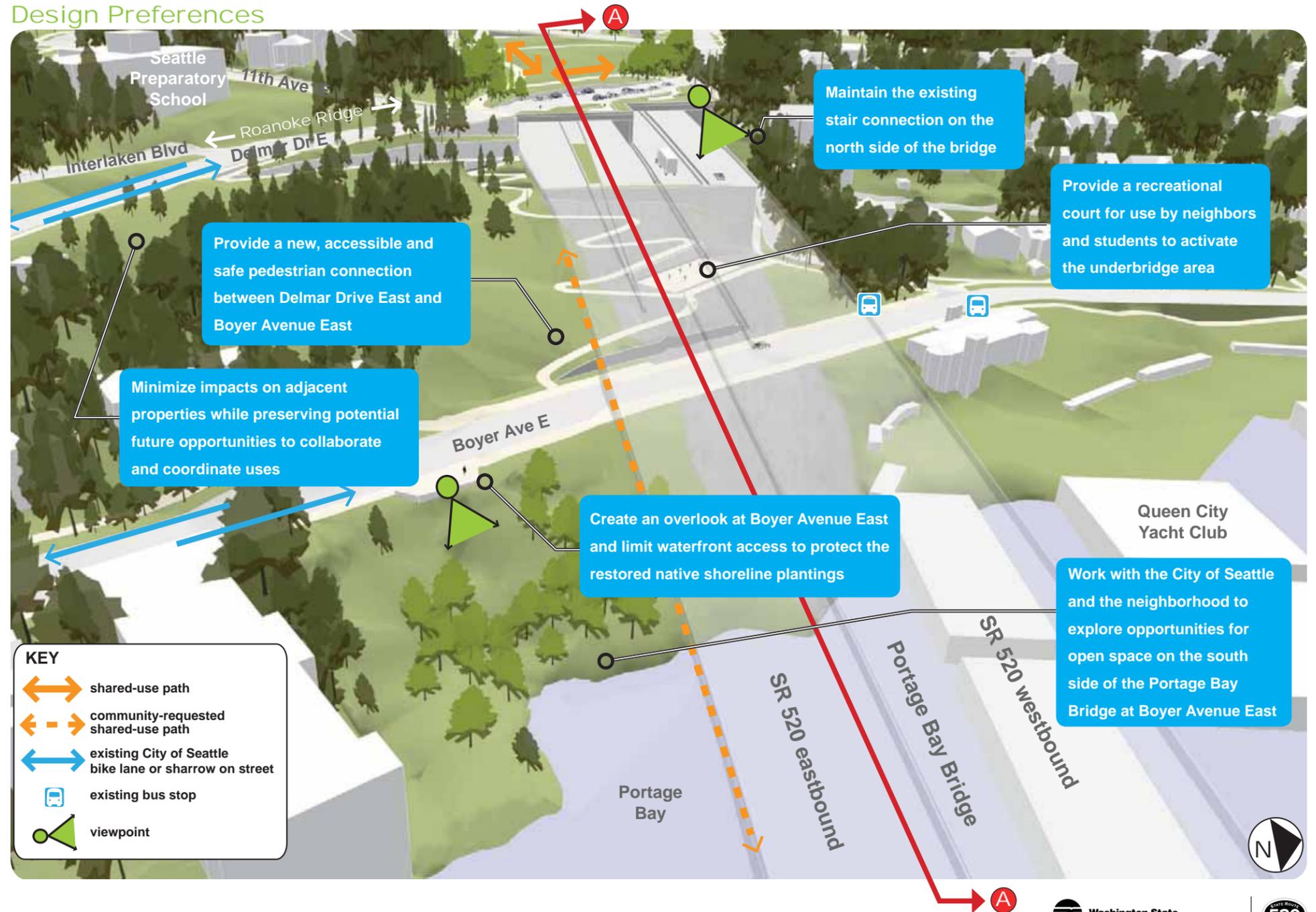
- Examined multiple locations for the regional shared-use path and other connections to and through the lid
- Identified bus stop locations
- Determined where it would be possible to locate large trees on the lid
- Evaluated the options for creating level, or terraced, spaces for the future consideration of programming ideas for the open space
- Defined where trees and open space would best help promote flexible use of the lid space while framing unique views
- Evaluated options for retaining existing significant trees on the south edge of the lid while ensuring that public spaces are safe for users
- Developed options for replacing and enhancing Bagley Viewpoint that also included both on-street and off-street parking options

# ROANOKE SUBAREA: DELMAR DRIVE EAST TO BOYER AVENUE EAST CONNECTION

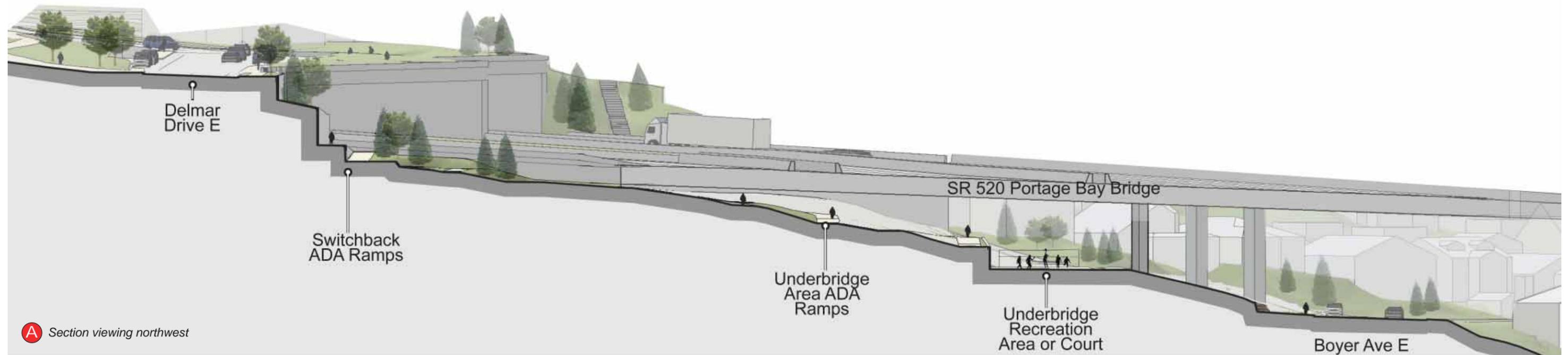
## Subarea Description

Within this subarea, the Roanoke ridge slopes steeply from Delmar Drive East to Boyer Avenue East and to Portage Bay. An existing substandard stairway on the north side of SR 520 is used by neighbors to connect to transit on Boyer Avenue East as well as to Montlake Playfield to the east and The Option Program at Seward (TOPS) School, Seattle Preparatory High School and Lake Union to the west. The existing underbridge area is overgrown and has been occupied by transients in the past leading to both the perception and reality of lack of safety.

## Design Preferences



## Section viewing northwest



**Conceptual Rendering:** A new pedestrian path and active spaces under the bridge connect Boyer Avenue East with Delmar Drive East to activate the underbridge area and to make it feel safer by providing additional lighting, planting at edges, hardscape and wayfinding

## What We Heard

- Replace and/or improve the existing Boyer steps
- Provide an accessible pedestrian connection on the south side of the bridge from Delmar Drive East to Boyer Avenue East
- Create access to the shoreline and develop shoreline property south of Portage Bay Bridge as a park or open space
- Address the safety of the underbridge area with a wide, well-used path to help activate the area

## What We Explored

- Considered a potential partnership with Seattle Preparatory High School to coordinate use of the adjacent open spaces for paths and activities
- Determined that the existing Boyer steps can be maintained in either their current location or in a new location
- Evaluated issues and opportunities for shoreline access and/or view points between Boyer Avenue East and Portage Bay
- Incorporated areas along the path and under the bridge for resting, viewing, exercising to activate the space and make it safer, including lighting, good sight lines and other means

# PORTAGE BAY BRIDGE

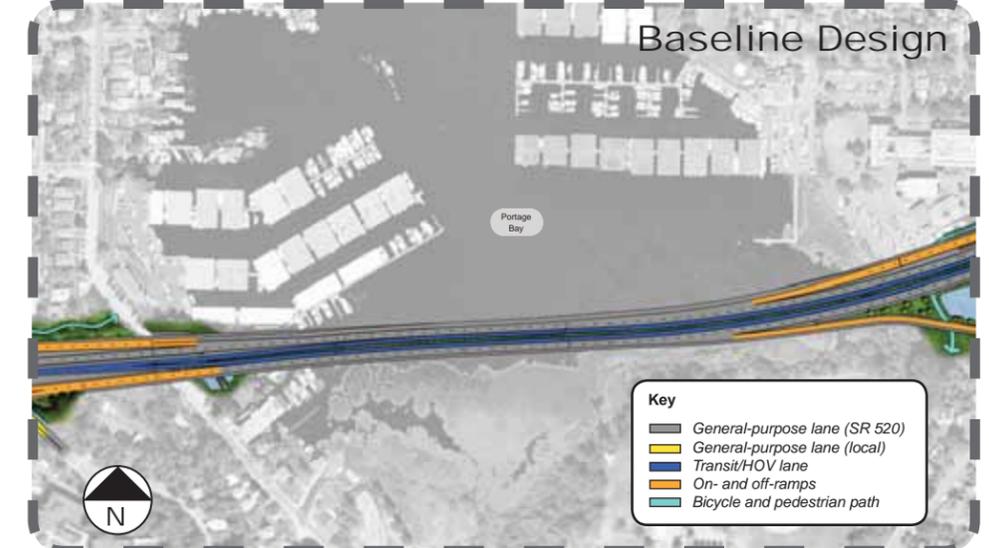
## Area Description

The Portage Bay basin is a picturesque area enclosed by the ridge at Roanoke, hillside residences, the wetlands and park area of Montlake Playfield and the University of Washington. The basin is bisected by the Portage Bay Bridge, which links the Montlake, Capitol Hill and Portage Bay neighborhoods. The area is notable for regular boat activity from the Montlake Cut and the Seattle and Queen City Yacht Clubs. Opportunities exist to provide a contextually appropriate bridge type that both reflects the surrounding area and creates a local and regional gateway.

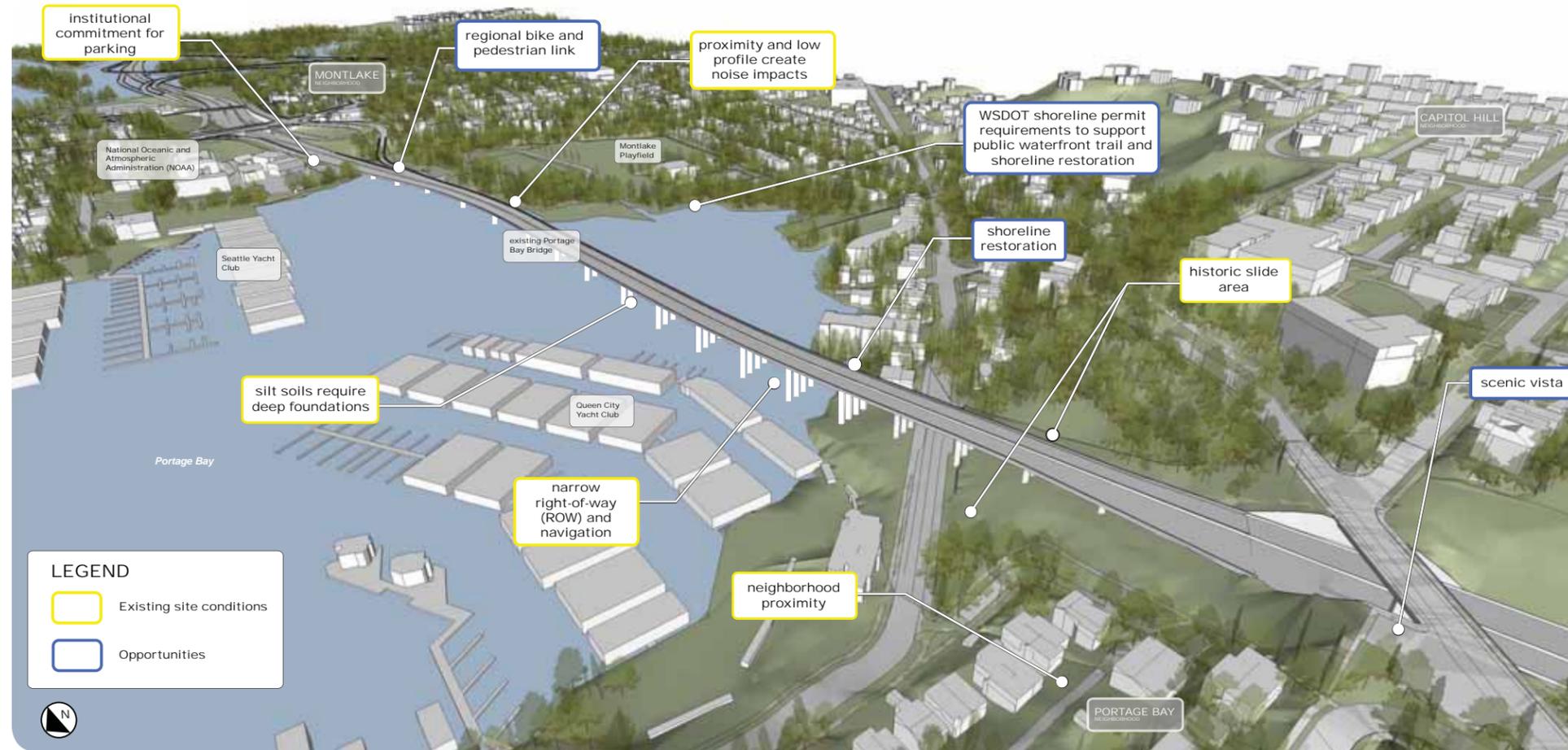
## Design Preferences



Portage Bay Bridge Area with SR 520 alignment for box girder bridge type



## Existing site conditions and future opportunities



“Assets and facilities should be efficient; that is, they should do more than one thing. As urban design progresses on SR 520, each asset should be viewed for its capacity to fulfill multiple functions.”

- Expert Review Panel *Final Report on SR 520 Westside Sustainability and Urban Design*  
September 24, 2011

## What We Heard

- Blend the Portage Bay Bridge structure into the surrounding historic neighborhoods
- Consider existing and future bicycle/pedestrian path connections in and around Portage Bay
- Develop a continuous green linkage from the Montlake lid to Montlake Playfield and the 10th and Delmar lid
- Incorporate a bicycle/pedestrian facility into the design of the new Portage Bay Bridge, allowing bicycle riders and pedestrians to easily and safely connect from the new SR 520 bridge to Capitol Hill via Montlake as well as to bike routes connecting to Eastlake, South Lake Union and downtown
- Take into account that the Portage Bay Bridge area presents a number of challenges to designing and constructing a new bridge

- Create continuous linkages to connect gaps in existing local and regional paths and trails; plan for and build separated/protected bicycle facilities (cycle tracks, buffered bicycle lanes) to the greatest extent possible, minimizing the use of sharrows
- Provide a continuous trail connecting the Portage Bay kayak launch, Bill Dawson Trail, the Seattle Yacht Club, West Montlake Park and the Arboretum Waterfront Trail
- Provide safe places under bridges with good connections and activities
- Reduce construction duration
- Design an iconic bridge
- Focus on box girder and cable stayed concepts going forward, because although there was mixed feedback regarding preferred bridge type, the most positive feedback was received for these types

## What We Explored

- Studied safe and effective bicycle and pedestrian connections from Montlake to downtown Seattle and north Capitol Hill
- Evaluated views to and from the Portage Bay Bridge
- Reduced impacts on the community and the environment
- Examined a contextually appropriate signature bridge structure that accommodates all users
- Explored bridge types that take into account the difficult soil profile of the lake bottom and reduce visual impacts both in the water and above the bridge deck
- Evaluated multiple bridge types and selected the box girder, extradosed and cable stayed bridge types for further evaluation
- Studied trade-offs with a shifted alignment north that could reduce construction duration and project impacts

# PORTAGE BAY BRIDGE DESIGN CONCEPTS

## Highlights of the Portage Bay Bridge Cable Stayed Option

### Cable Stayed Option

The cable stayed bridge design option maintains the roadway operations of the baseline design while shifting slightly to the north to reduce constructability issues. Other issues that relate to the bridge are:

#### Over

- Two sets of moderate-height cable stayed towers (approximately 180 feet tall from the bridge deck) at the west end of the bridge

#### Under

- One hillside foundation west of Boyer Avenue East with a main span of 800 feet, minimizing impacts on Queen City Yacht Club operations
- A longer span that reduces in-water foundations and allows for improved visibility and water access across Portage Bay
- A gap of approximately 15 feet between bridge structures that reduces the scale of the structure from below and allows light and air flow

#### On

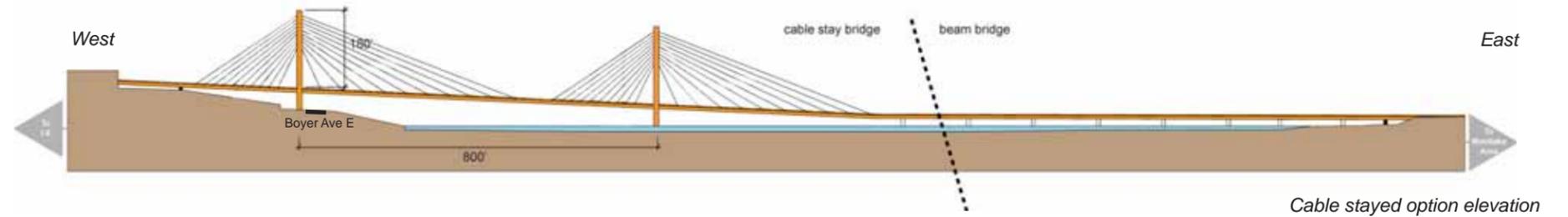
- A thin, light bridge deck supported by cable stays
- The eastern portion is a beam bridge with consistent span lengths

## Benefits

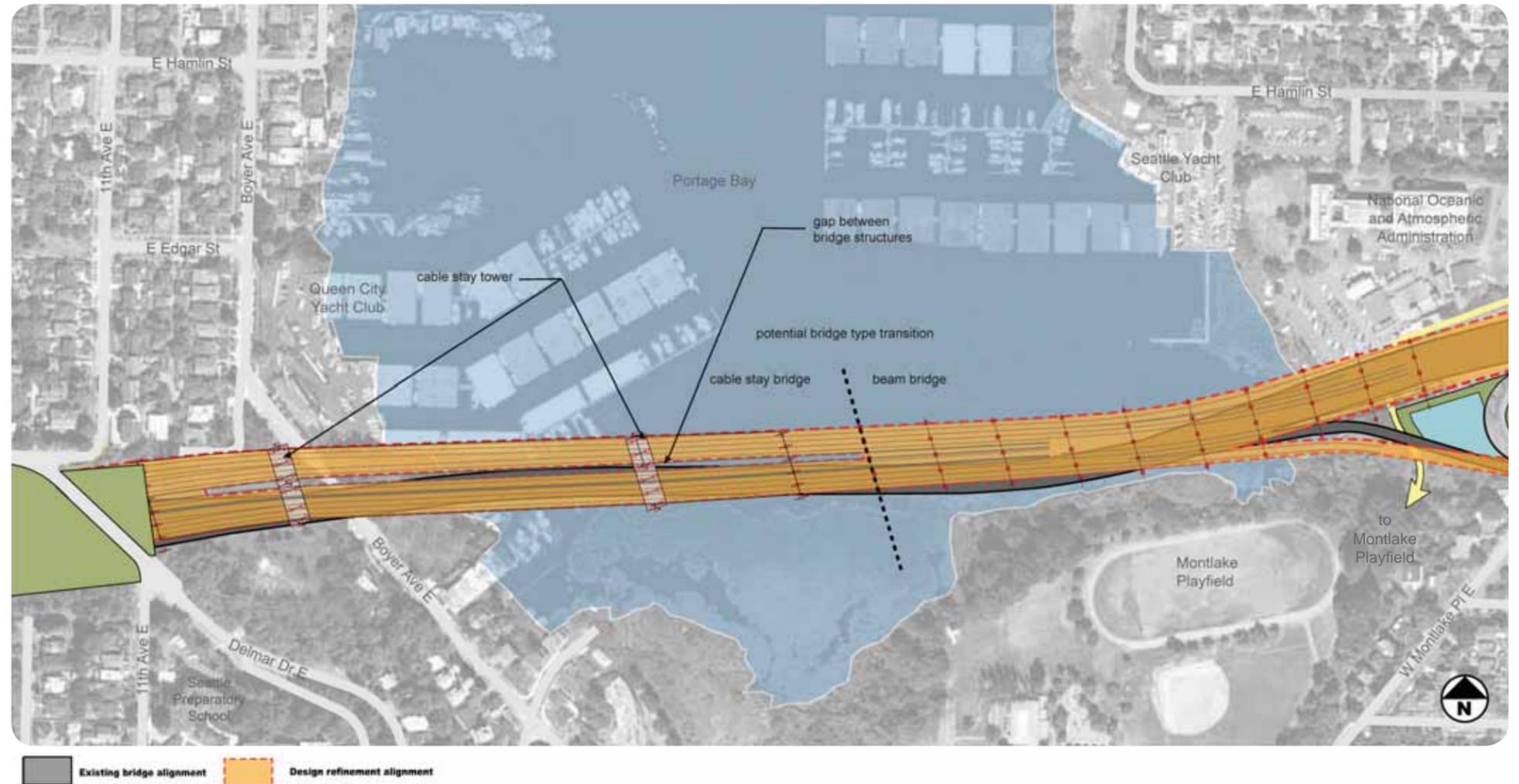
- Provides a signature bridge of regional significance at Portage Bay
- Represents a modern design with lightness and transparency
- Less below-deck structure, long span open the bay below for access and visibility
- Less material and less in-water work

## Considerations

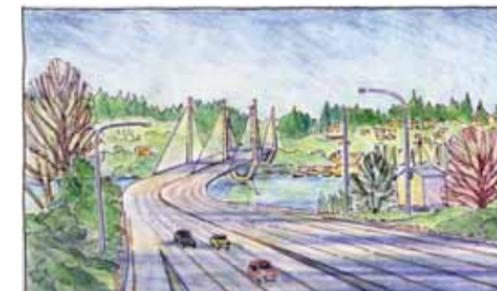
- More expensive option could present budget challenges
- The design should be contextually appropriate
- Slightly wider structure width with gap between structures



## Cable stayed option alignment



View from West Montlake Park facing southwest

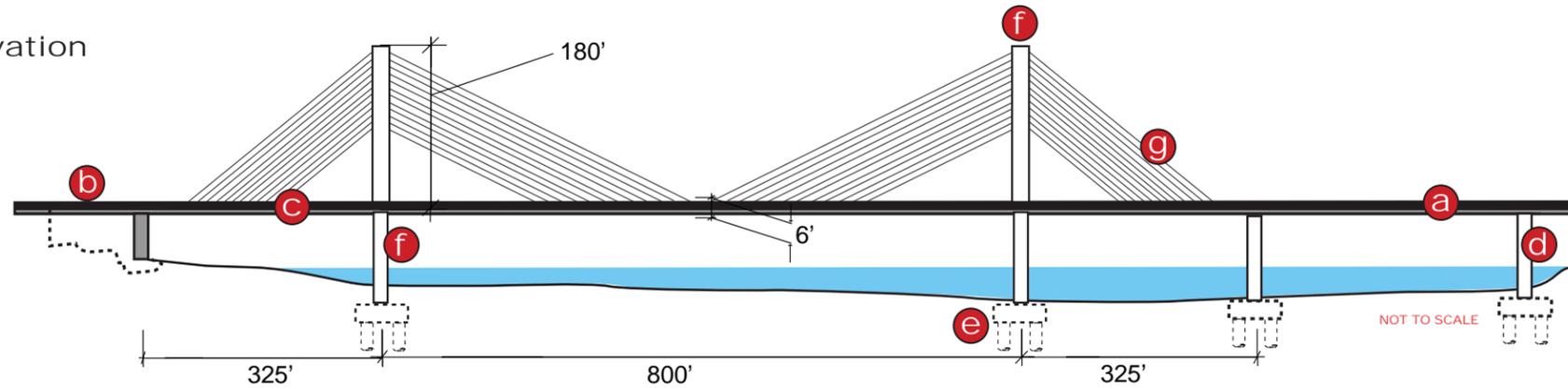


View from Montlake Boulevard East facing west



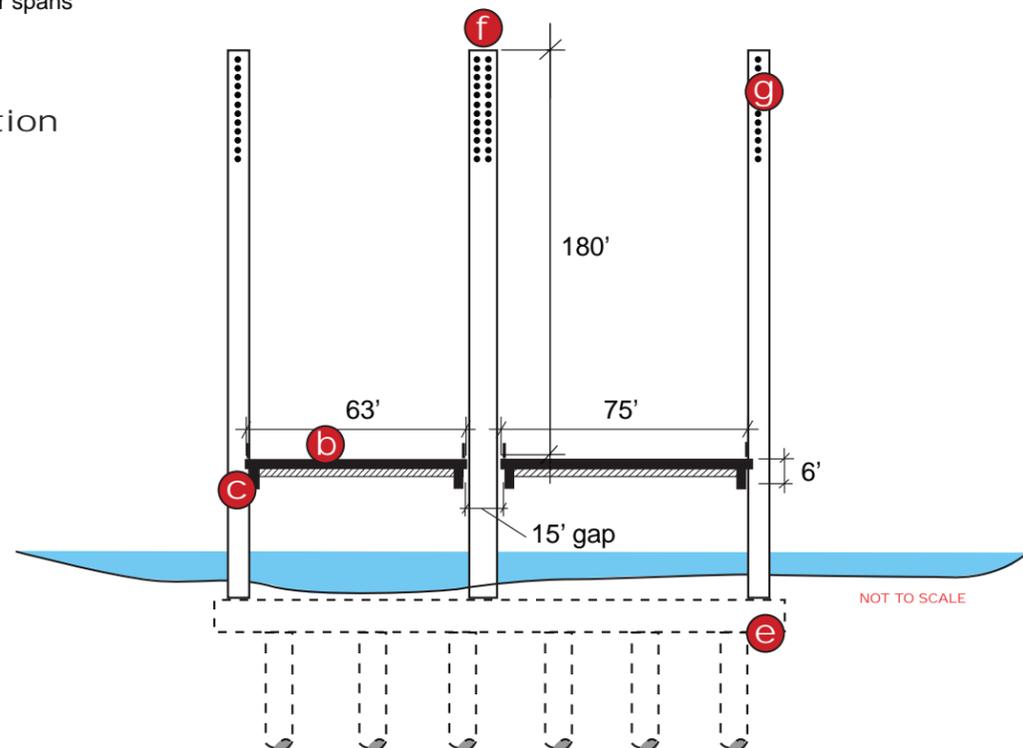
View from Montlake Playfield facing northwest

## Bridge Elevation

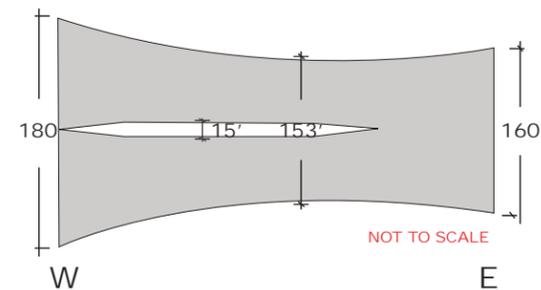


- a** Approach Span  
The bridge section or sections connecting the abutment with the main bridge span or spans
- b** Deck  
The roadway portion of a bridge that directly supports vehicular, bicycle and pedestrian traffic
- c** Edge Girder  
The outermost beams that support the edge of the roadway deck
- d** Pier  
A vertical supporting structure comprised of a series of columns
- e** Foundation  
A pile cap and piles, like a column, drilled into the ground to support the bridge
- f** Tower  
The vertical structure that extends above the deck with cables that support the deck
- g** Stay Cable  
A prestressing member comprised of numerous strands assembled together to form a tension member to support the deck

## Bridge Section



## Bridge Diagrammatic Footprint



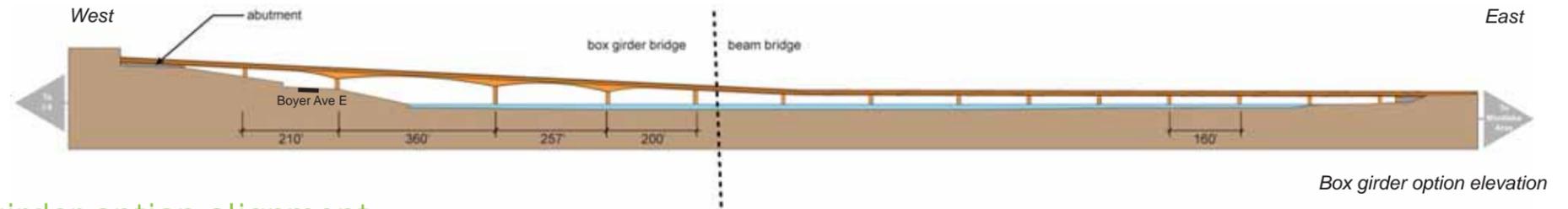
## Cable stayed bridge components

### Construction

- Minimal scaffolding required during construction
- Longest spans from 325 to 800 feet
- Thinnest deck thickness at 6 feet with minimum elevation changes to existing road systems
- 15-foot gap between east and westbound bridge decks allow light and air flow below bridge

### Environment

- Overall footprint of bridge has same square footage as baseline bridge design
- Above deck, view impacts from 180 foot towers; however, cables appear to disappear in daylight, thereby easing visual obstructions
- Below bridge deck, less visual and physical (nautical and marine life) disruption to areas during or after construction due to minimal number of piers



### Box girder option alignment



## Highlights of the Portage Bay Bridge

### Box Girder Option

The box girder bridge design option maintains the roadway operations of the baseline design while shifting the alignment slightly to the north to reduce constructability issues. Other issues that relate to the bridge are:

#### Over

- No structure above the bridge deck, except required safety features, signage and lighting

#### Under

- The western portion is a box girder bridge type with a maximum span length of 360 feet
- More structure under the bridge

#### On

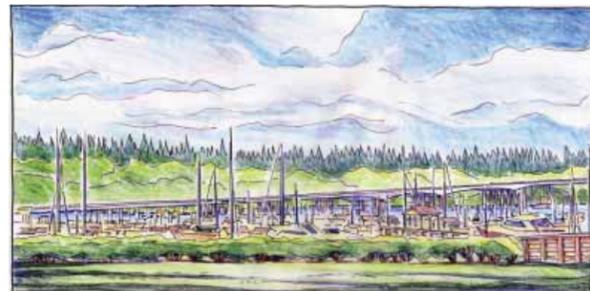
- Thicker bridge deck
- The east end of the bridge is a beam bridge

### Benefits

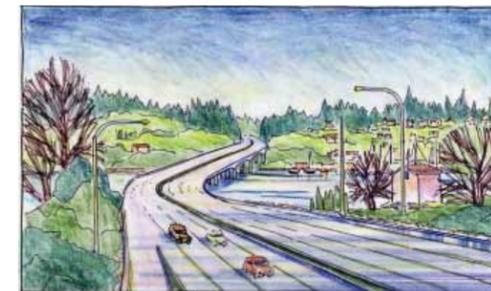
- Cost-efficient structure with moderate span lengths
- Variable depth at the columns creates a curvilinear form
- Fewer above-deck structures allows for maximum visibility

### Considerations

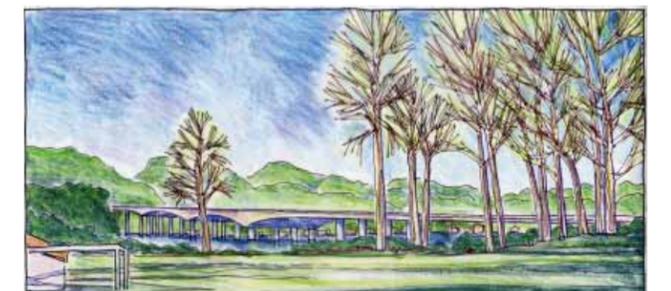
- Moderate span lengths create operational and construction impacts on the west end of the bridge
- More in-water and hillside foundations are located in poor soils because more spans are required



View from West Montlake Park facing southwest

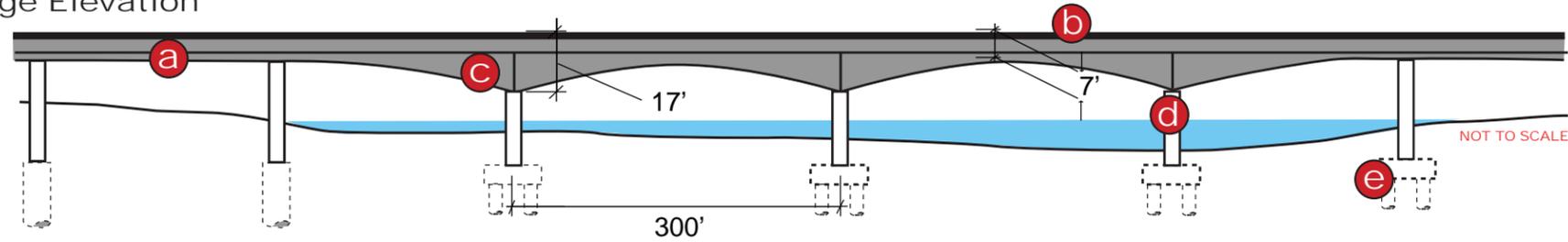


View from Montlake Boulevard East facing west



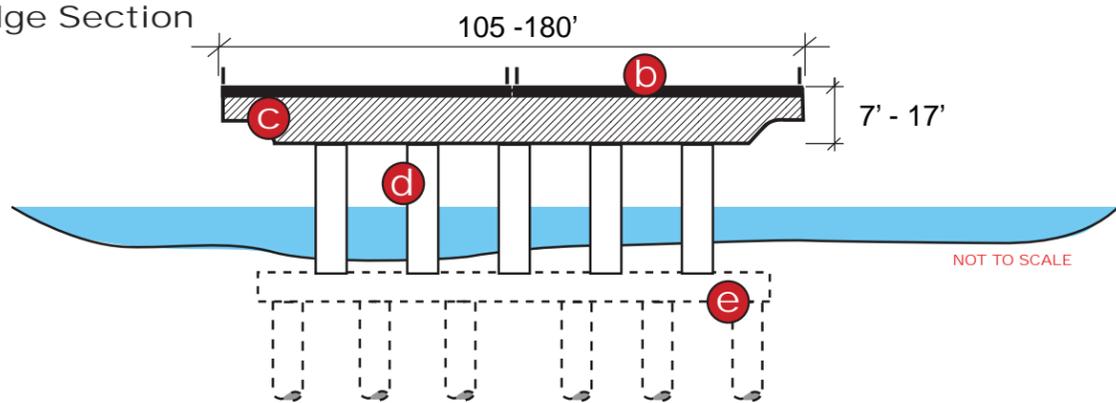
View from Montlake Playfield facing northwest

Bridge Elevation

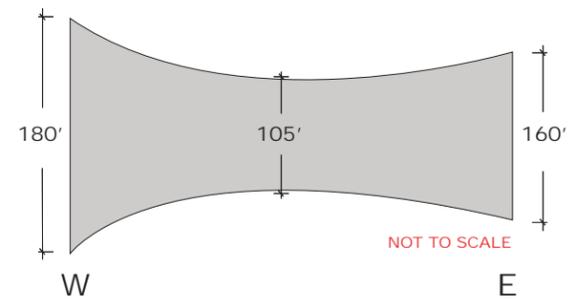


- a** Approach Span  
The bridge section or sections connecting the abutment with the main bridge span or spans
- b** Deck  
The roadway portion of a bridge that directly supports vehicular, bicycle and pedestrian traffic
- c** Box Girder  
A support beam below the bridge deck
- d** Pier  
A vertical supporting structure comprised of a series of columns
- e** Foundation  
A pile cap and piles, like a column, drilled into the ground to support the bridge

Bridge Section



Bridge Diagrammatic Footprint



## Box girder bridge components

### Construction

- Scaffolding required due to hourglass shape of bridge
- Deck spans shorter than cable stayed bridge type, typically between 120 and 300 feet
- Deeper superstructure required at piers, up to 17 feet

### Environment

- Some view impacts above the deck
- Views below deck are obscured due to the number of piers required with the shorter spans
- Larger effects on marine life and the aquatic environment beneath bridge due to construction method and more piers in the water



**Conceptual Rendering**  
*Montlake Lid Option B showing the lowered transit/HOV ramp (looking north)*

# MONTLAKE AREA

## Area Description

The Montlake area is dynamic and urban, with a high concentration of uses, activity centers, and destination points, including residential, educational, medical, cultural, commercial, and recreational. The area comprises several subareas that were studied in the course of the SCDP including: East Lake Washington Boulevard, Montlake Boulevard East, west Montlake lid and Canal Reserve, Bill Dawson Trail, stormwater treatment area, east Montlake lid and the east entrance to the Montlake lid tunnel.

The Montlake neighborhood is eligible for historic district status through the National Register of Historic Places. It contains a number of designated historic sites, including the National Oceanic and Atmospheric Administration (NOAA), the Seattle Yacht Club, the Shelby-Hamlin neighborhood, the Montlake Cut, the Montlake bascule bridge, the University of Washington lower southeast campus, the Washington Park Arboretum, Montlake Boulevard East and East Lake Washington Boulevard. These boulevards are important as part of the footprint of the Olmsted brothers' parks and green boulevards legacy. Montlake Boulevard has the potential to become a more vibrant, user-friendly space with more accessible paths, safer crossings, usable open space, and augmented plantings.

## Montlake Subareas



Refined baseline design with Design Preferences based on community input (July 2012)



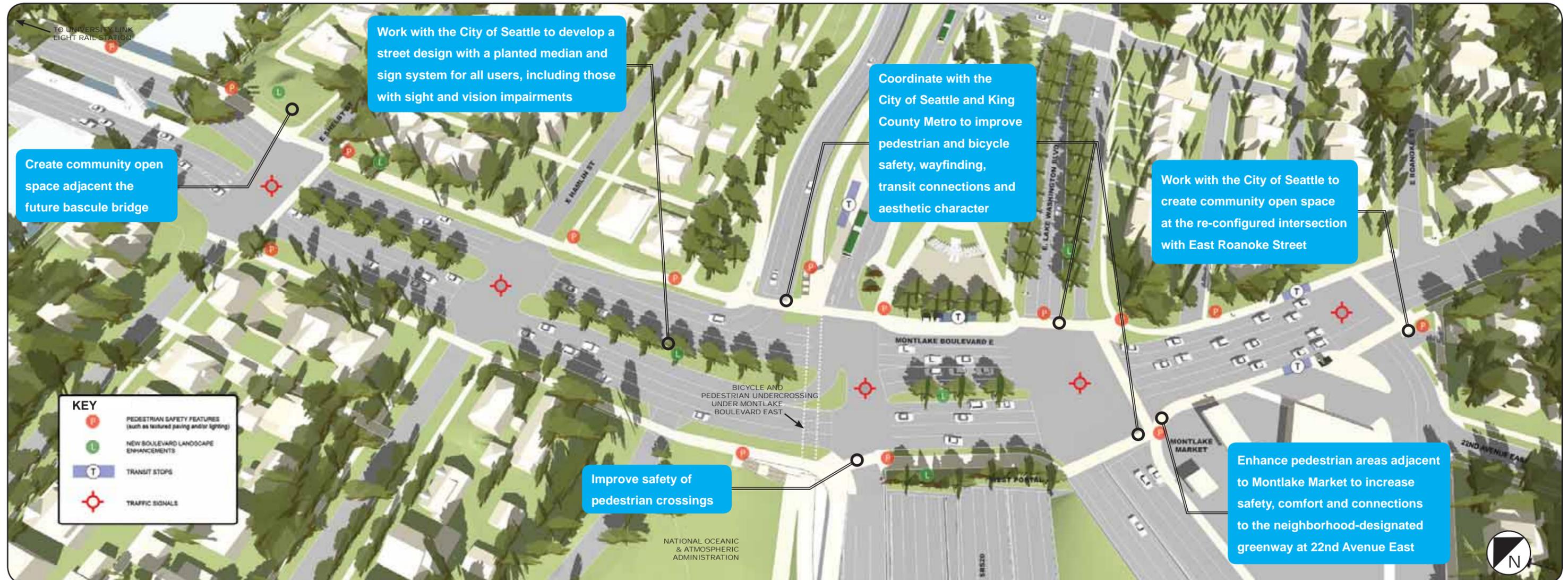
# MONTLAKE SUBAREA: MONTLAKE BOULEVARD EAST

## Subarea Description

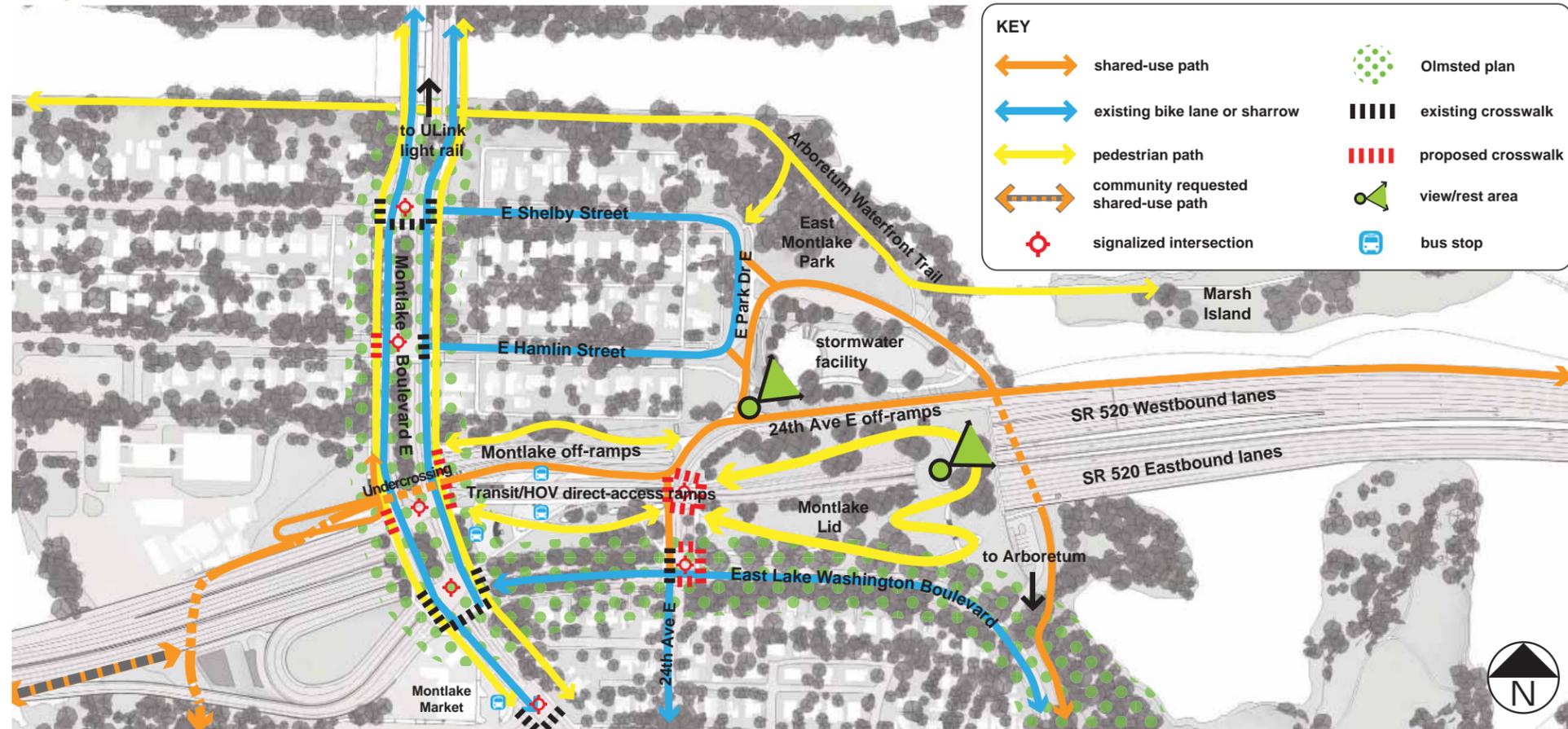
The Montlake Boulevard East subarea serves as a busy crossroads for local and regional travel and multimodal connections. It is also within close proximity to the University Link Light Rail Station, which is currently under construction. Montlake Boulevard East is part of State Route 513 and is a City of Seattle truck route. It is also designated as part of the historic "University" Boulevard, which extended from the site of the 1909

Alaska-Yukon-Pacific Exposition and continued along Lake Washington Boulevard. High-volume traffic, narrow sidewalks and difficult pedestrian crossings converge to create an undesirable environment for pedestrians and cyclists. An important north-south axis, Montlake Boulevard East has the potential to become a successful urban boulevard, providing access to the Washington Park Arboretum and the series of gateways along the SR 520 corridor.

## Design Preferences



## Bicycle and pedestrian connections



## Existing conditions at Montlake Boulevard East



Looking south along the existing Montlake Boulevard East at SR 520



**Conceptual Rendering:** The western portion of the Montlake lid over SR 520 mainline will serve as a mobility hub, including transit stops and could have spaces for public markets or other active uses

## What We Heard

- Enhance bicycle and pedestrian safety and connectivity along Montlake Boulevard East
- Provide a buffer between the new bascule bridge and the adjacent neighborhood
- Reduce pedestrian crossing widths and include clear signs and appropriate orientation devices for sight- and hearing-impaired users

## What We Explored

- Evaluated the best allocation of space to balance all uses within the existing 150-foot right-of-way width
- Evaluated curb geometry and design features such as landscaping and bollards to create safer pedestrian and bicycle environments
- Identified areas available for future community open space and/or neighborhood buffers
- Considered bus stop locations that best balance convenient and safe access with efficient transit operations
- Worked to provide a safe, comfortable connection from the regional shared-use path, the lid and transit to surrounding neighborhoods, the University of Washington, Burke-Gilman Trail and other destinations
- Accommodated multimodal mobility through this area
- Defined opportunities to reinforce Olmsted brothers' parks and green boulevards footprint and the historic character of the boulevard

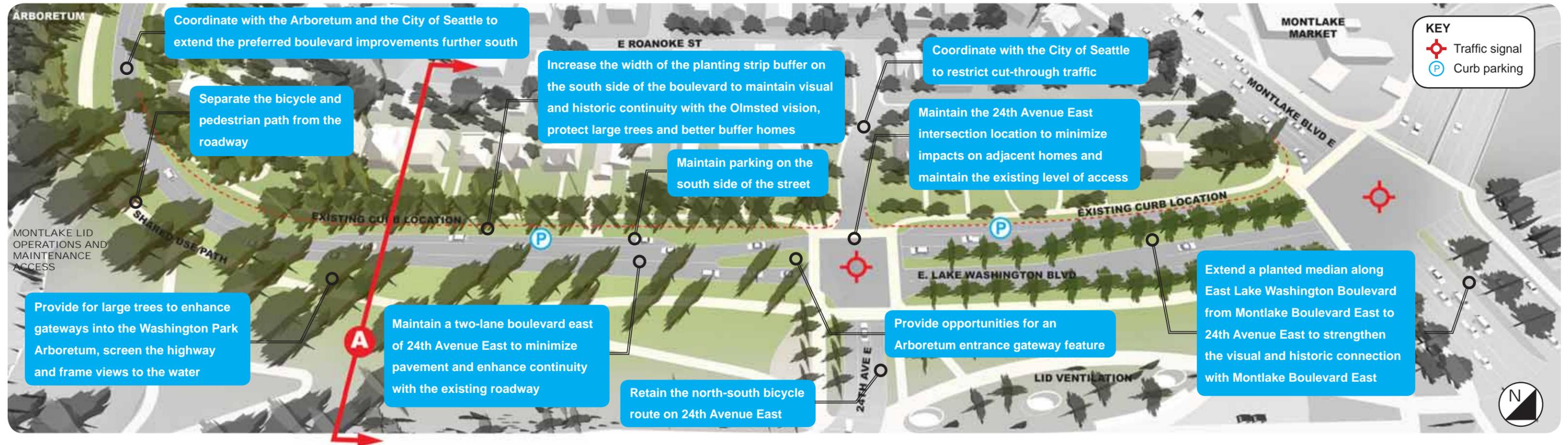
# MONTLAKE SUBAREA: EAST LAKE WASHINGTON BOULEVARD

## Subarea Description

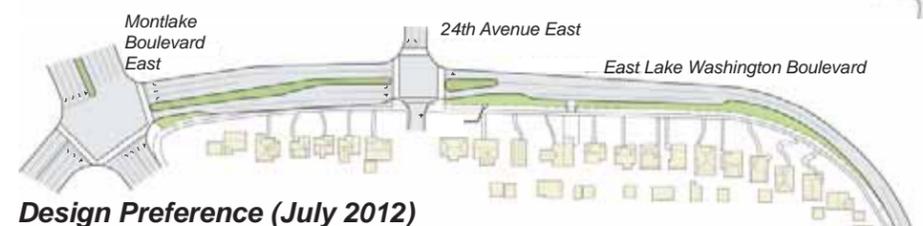
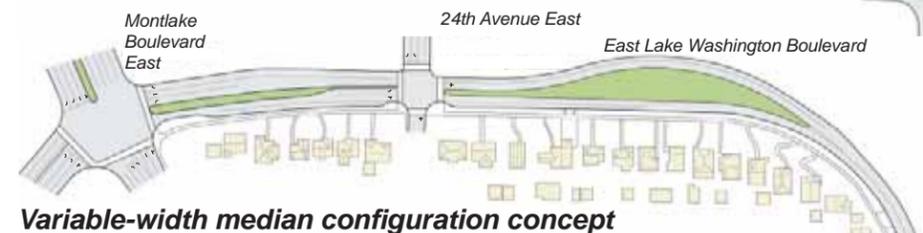
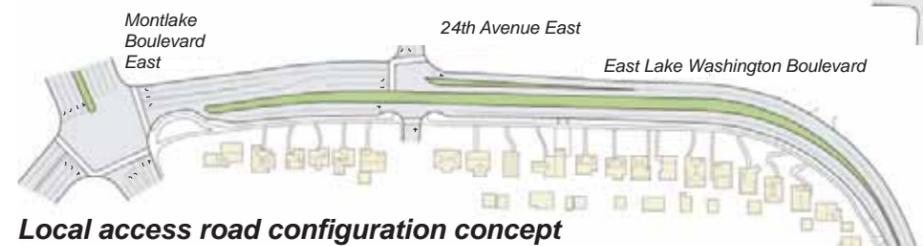
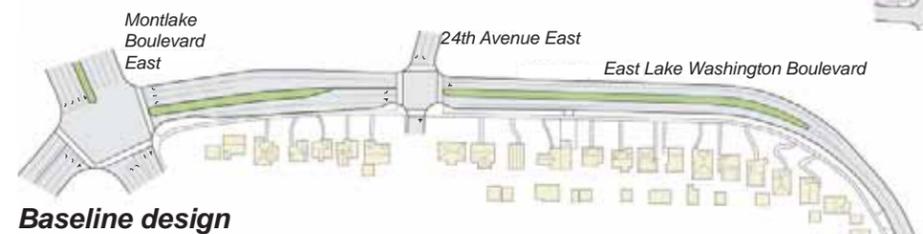
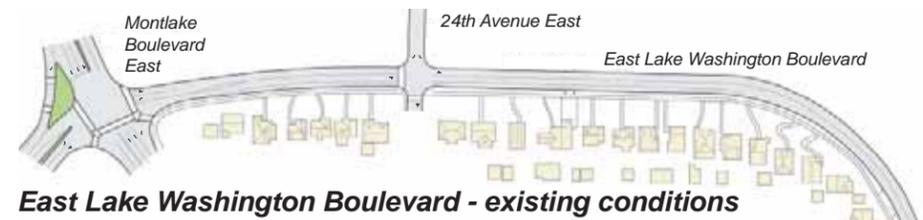
The East Lake Washington Boulevard subarea is part of the historic "University Boulevard," which included Montlake Boulevard and stretched from the 1909 Alaska-Yukon-Pacific Exposition to the Washington Park Arboretum. The roadway is well-traveled by vehicles and intrepid cyclists moving north and south between the University of Washington, Washington

Park Arboretum and the Madison Park neighborhood. The existing boulevard is lined by large linden trees and gracious homes. The baseline design proposed a planted median stretching from Montlake Boulevard to Miller Street East. Proposed design refinements will require further study and consideration for consistency with historic and preservation guidelines.

## Design Preferences



## East Lake Washington Boulevard configurations studied



## Section viewing northwest See diagram on previous page for section location



**Conceptual Rendering:** The design preference for the south side of East Lake Washington Boulevard proposes widening the planting strip to allow more room and healthier conditions for existing larger trees and to be consistent with the design of the boulevard further south and at the north entrance to Washington Park Arboretum (view looking west along East Lake Washington Boulevard)

## What We Heard

- Prevent traffic congestion on neighborhood streets as well as neighborhood cut-through traffic
- Screen residences from noise and visual impacts
- Provide a safer, more pleasant pedestrian and bicycle environment
- Preserve mature vegetation where possible
- Preserve the historic character of the boulevard and improve connections to the Washington Park Arboretum
- Address traffic control southbound on 24th Avenue East
- Extend boulevard improvements to the south as far as possible
- Blend the area with the character of the Washington Park Arboretum

## What We Explored

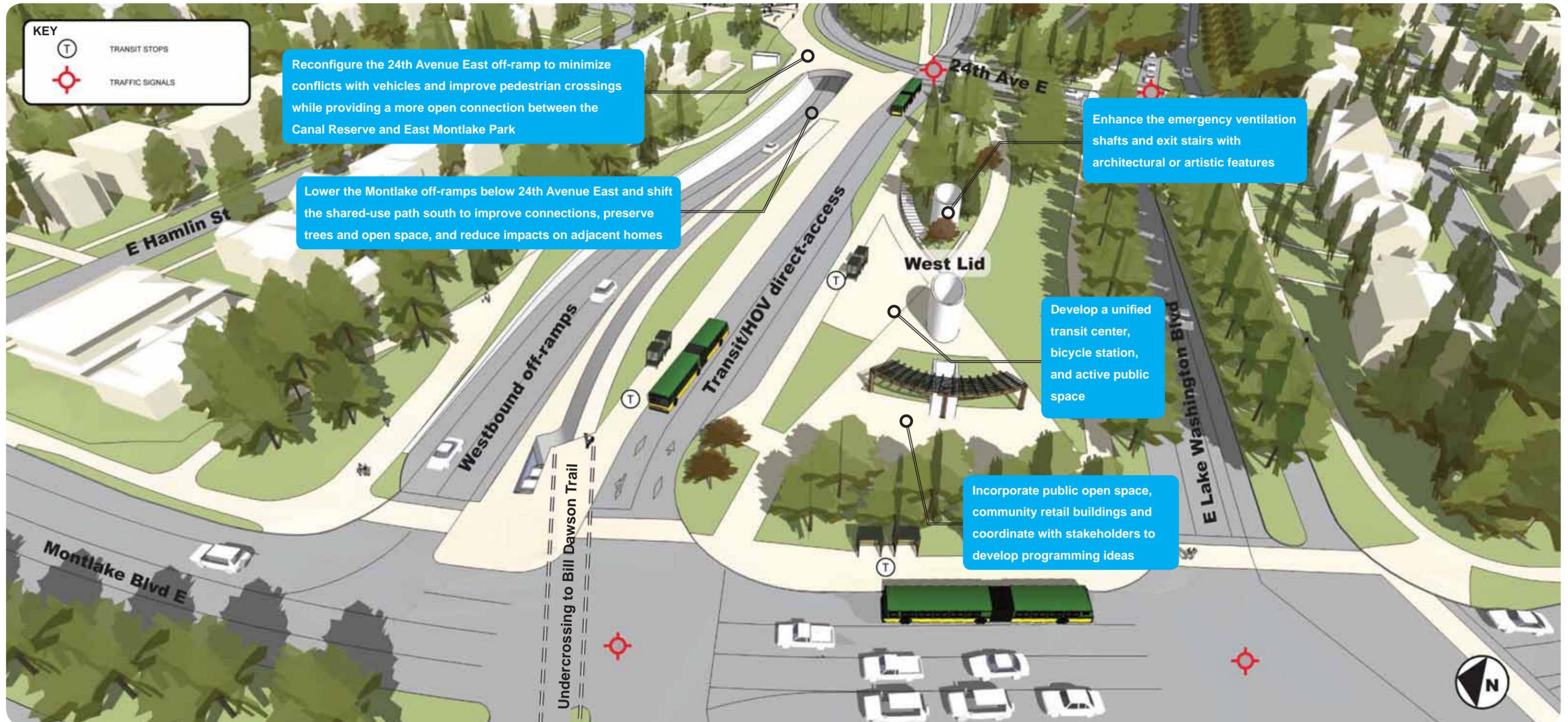
- Evaluated on- and off-ramp configurations and intersections that reduce cut-through traffic on neighborhood streets
- Developed and compared different configurations for reducing noise and visual impacts on adjacent homes while maintaining required access
- Considered different locations for bicycle and pedestrian paths adjacent the boulevard
- Evaluated which roadway configurations (see adjacent examples) would best realize the required Olmsted brothers' parks and green boulevards footprint in coordination with the Washington Park Arboretum North Entry project
- Worked to develop East Lake Washington Boulevard as a gateway, or series of gateways, to Washington Park Arboretum
- Explored options to restrict non-local vehicular cut-through traffic in the neighborhood
- Extended boulevard improvements south to Roanoke Street East where possible
- Selected a design preference that minimizes the total pavement area required to meet vehicular needs

# MONTLAKE SUBAREA: WEST MONTLAKE LID AND CANAL RESERVE

## Subarea Description

The western portion of the Montlake lid subarea includes all the project elements between Montlake Boulevard East and 24th Avenue East, the Canal Reserve area and East Lake Washington Boulevard. The west Montlake lid will span over SR 520 between these adjacent streets. The Canal Reserve area contains specimen and other significant trees and

public open space, as well as east- and westbound transit and a northbound transit stop. Montlake Boulevard East in this area adjacent to the West lid and Canal Reserve is a high-volume arterial and designated truck and transit route.



## West lid and Canal Reserve area connectivity



## Existing conditions at Montlake Boulevard East



Existing view south along Montlake Boulevard East



View west at where existing SR 520 off-ramps meet Montlake Boulevard East



**Conceptual Rendering:** The western portion of the Montlake Lid over SR 520 mainline will serve as a mobility hub connecting cyclists, pedestrians and transit riders (view looking northeast above Montlake Boulevard East)

## What We Heard

- Reduce the noise and visual impacts of the westbound off-ramps on adjacent homes
- Improve bicycle/pedestrian connectivity and safety
- Preserve as many of the existing trees as possible to maintain a visual buffer between the off-ramps and adjacent homes

## What We Explored

- Explored different off-ramp and intersection configurations that move the off-ramps further from residential areas, reducing visual impacts
- Studied different off-ramp and intersection configurations that reduce conflicts between bicycles/pedestrians and vehicles
- Evaluated off-ramp and regional path options that preserve more existing trees and maximize landscaping opportunities
- Provided more direct connections to the Montlake lid transit stops from both the regional path as well as surrounding neighborhoods

- Straightened and shortened the regional shared-use path undercrossing connection to the Bill Dawson Trail to be more inviting, safe and attractive
- Activated the Canal Reserve area by providing both green and pathway connections to East Montlake Park, adjacent neighborhoods, the stormwater facility, Montlake Playfield and north to Montlake Boulevard East

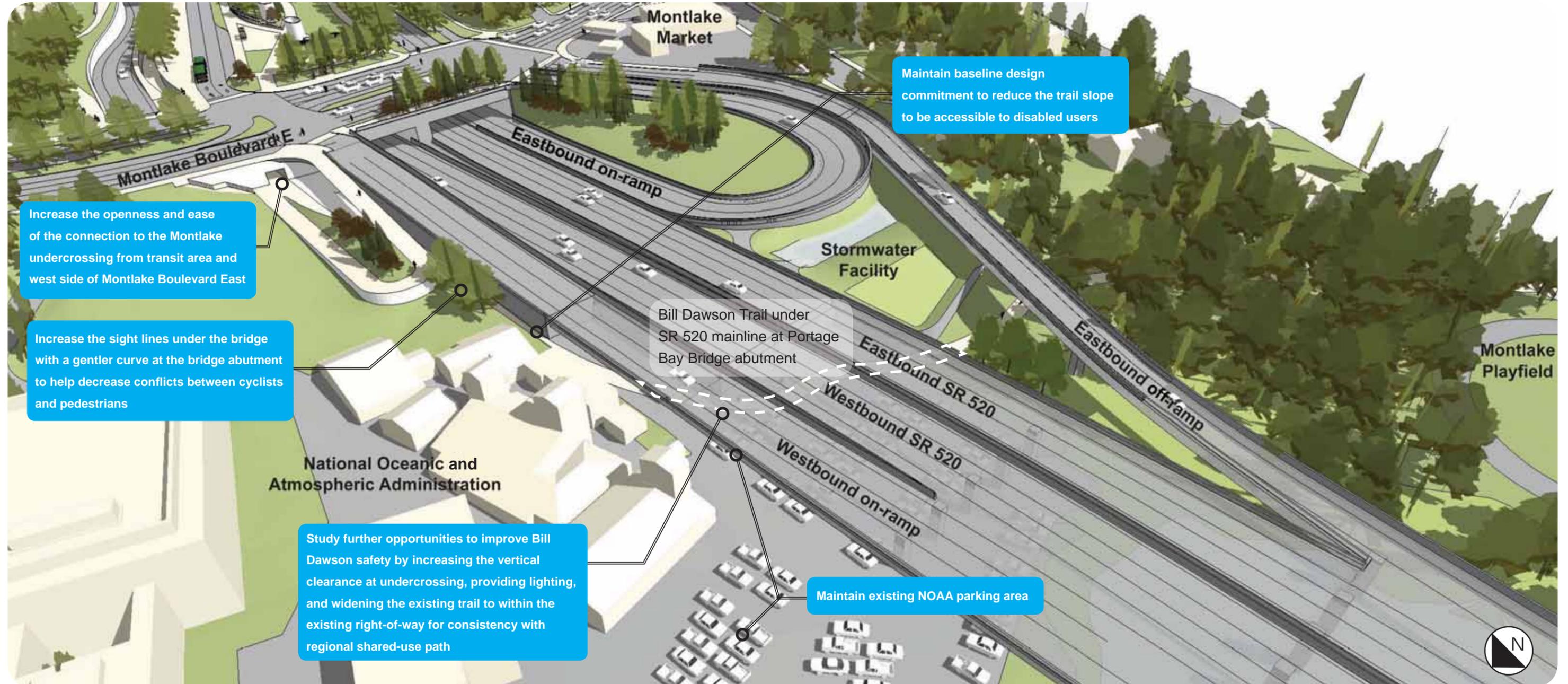
# MONTLAKE SUBAREA: BILL DAWSON TRAIL/EAST PORTAGE BAY BRIDGE UNDERBRIDGE AREA

## Subarea Description

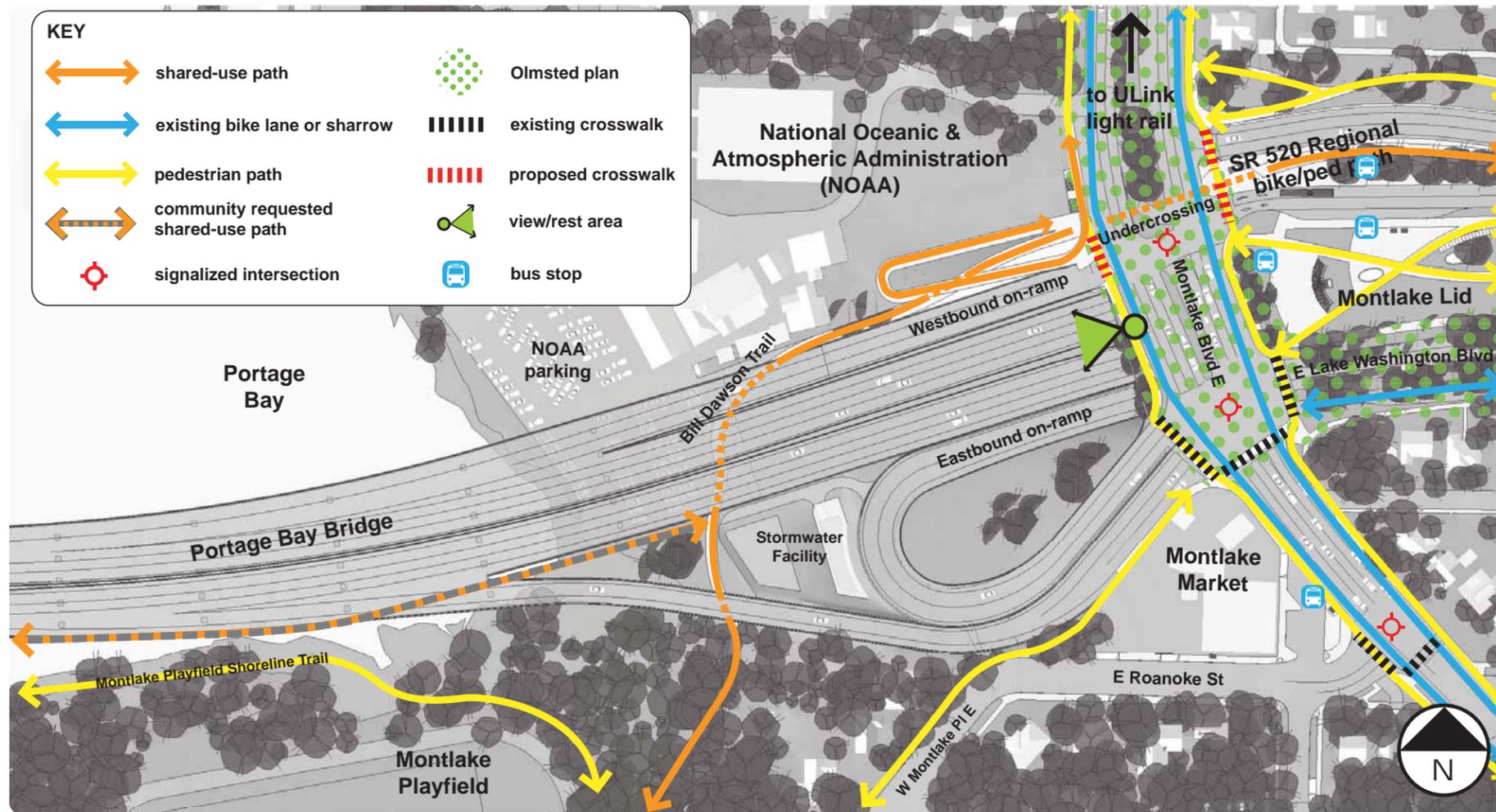
The East Portage Bay underbridge area is located at the west edge of the proposed Montlake lid between the National Oceanic and Atmospheric Administration's (NOAA) Northwest Fisheries Science Center to the north and businesses, residences and the Montlake Playfield to the south. The

Bill Dawson Trail is a steep, narrow asphalt trail just south of NOAA that hugs the northern edge of SR 520. It turns sharply under SR 520 and has a low structural clearance. The path runs adjacent to NOAA parking, which extends from the shoreline to the path edge and further north.

## Design Preferences



## Portage Bay Bridge east underbridge area connections



## Existing conditions at Portage Bay underbridge



View of trail and NOAA parking area, facing west

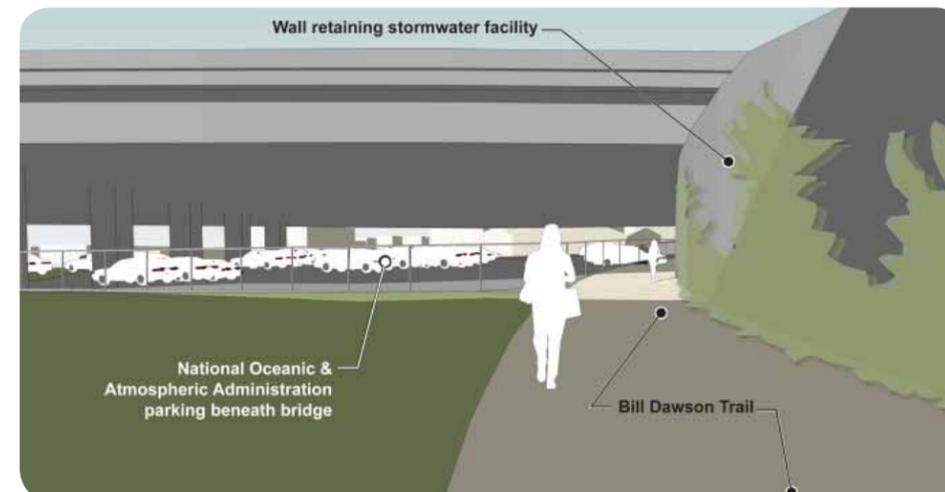


View of NOAA parking area, facing west

## Perspective view of trail facing west



## Perspective view of trail facing north



## What We Heard

- Activate areas for safety and comfort with widened paths, improved lighting and better sight lines
- Improve visual and shoreline conditions at the underbridge area, including better vertical clearance under the structure along Bill Dawson Trail and improved relationship of trail to adjacent uses
- Explore opportunities to separate users on the path to reduce conflicts

## What We Explored

- Explored opportunities to modify the adjacent westbound off-ramp abutment structure to improve sight lines and increase turning radii
- Studied increased height of the undercrossing and use of lighting and other design features to increase safety and comfort

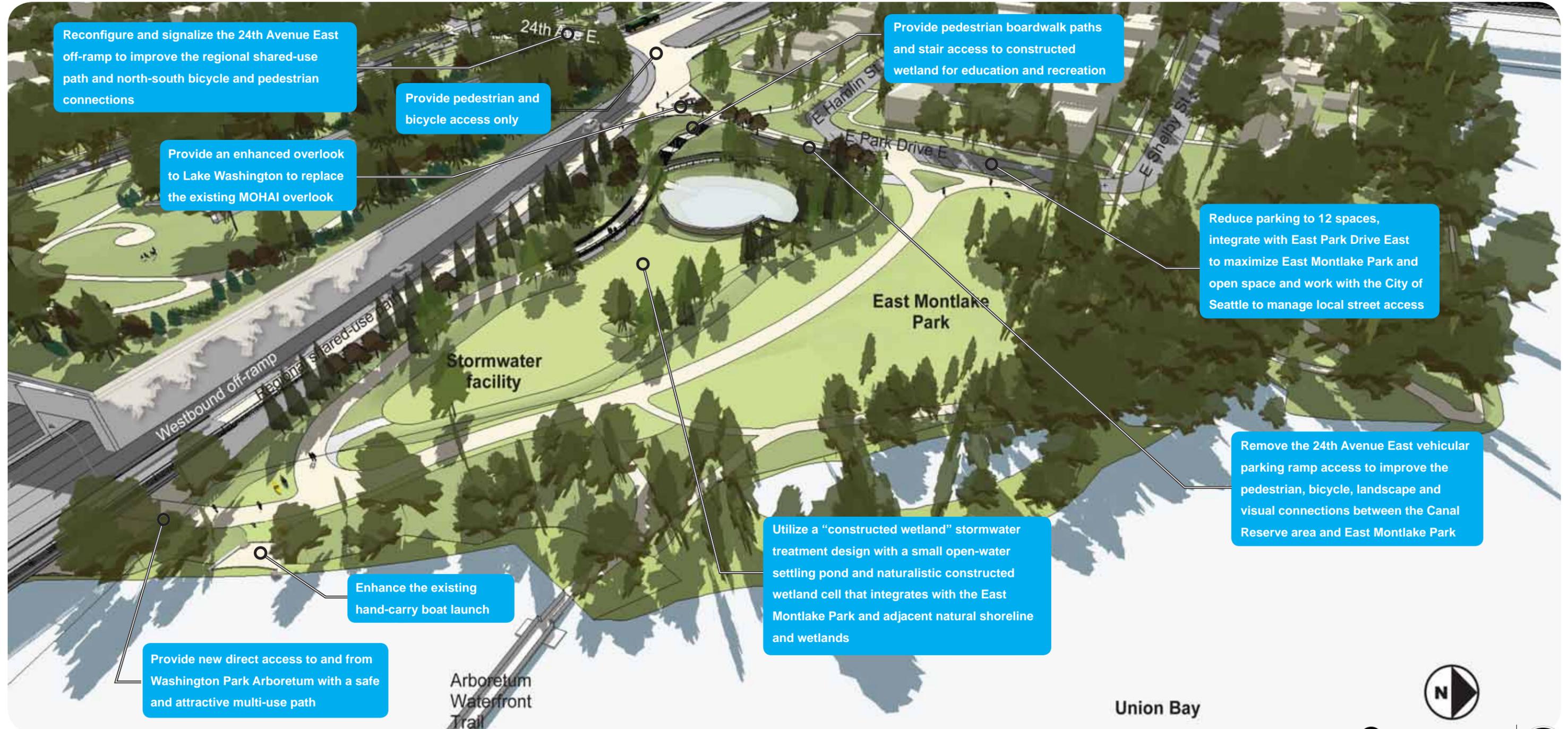
# MONTLAKE SUBAREA: STORMWATER TREATMENT AREA AND EAST MONTLAKE PARK

## Design Preferences

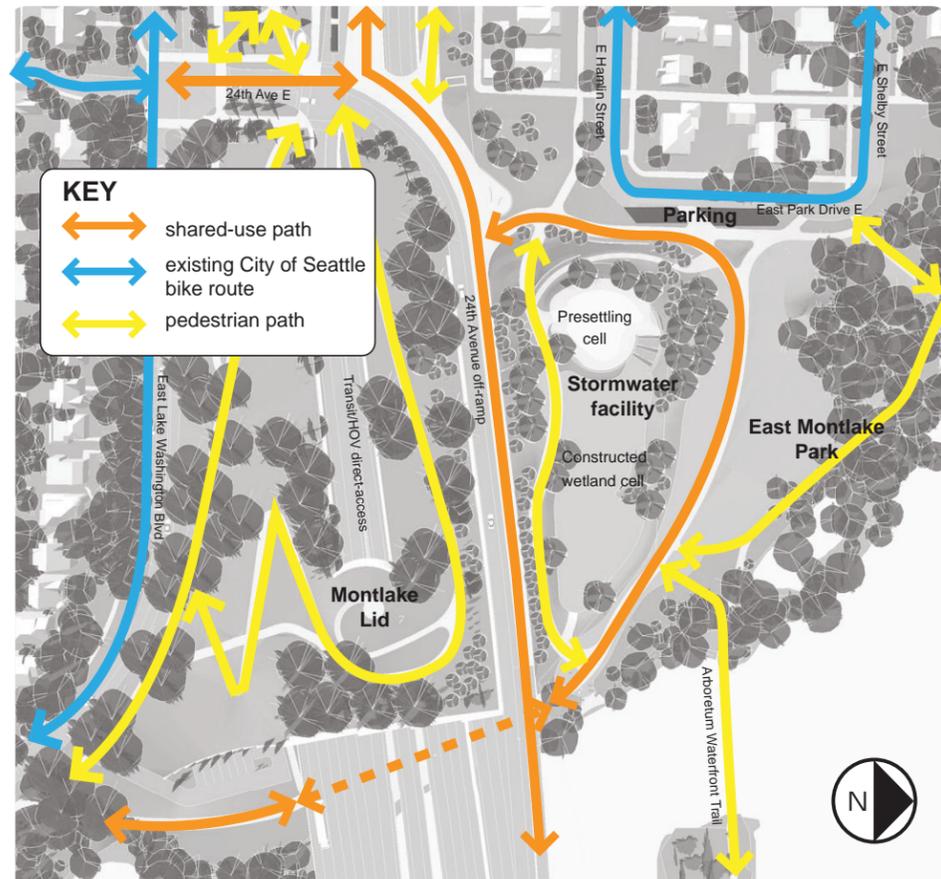
### Subarea Description

The proposed stormwater facility will be sited where the current McCurdy Park and the former Museum of History & Industry are located and adjacent to East Montlake Park and Union Bay wetlands. The facility will include a constructed wetland that will meet all water quality standards as identified by the City of Seattle, WSDOT and the Department of Ecology.

This area provides neighbors and other users access to the Arboretum Waterfront Trail at Marsh Island and provides parking as well as a hand-carry boat launch. East Montlake Park, to the north, is retained as a neighborhood park that is intended to serve the surrounding neighborhoods.



## Stormwater area connectivity



## What We Heard

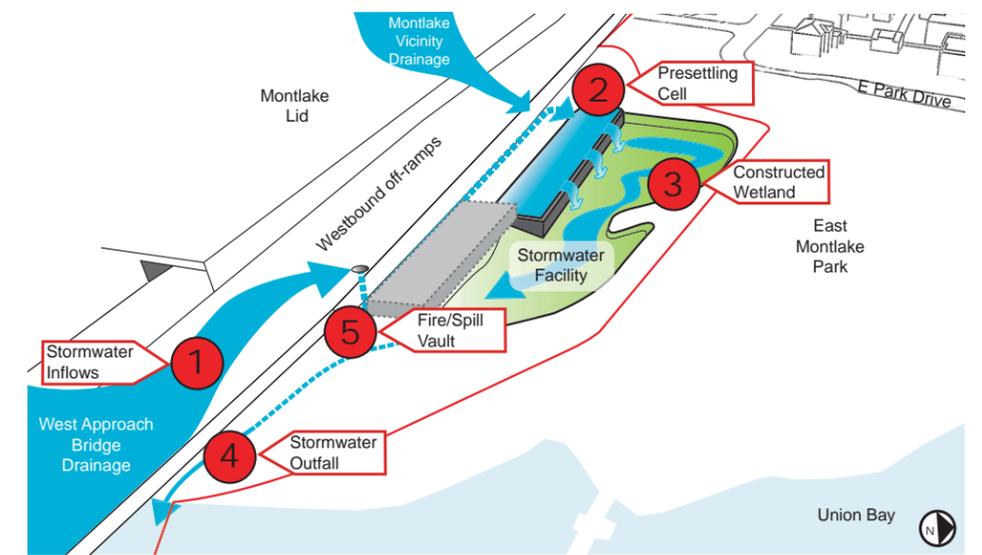
- Choose a treatment design that is visually attractive and that best integrates public access
- Reduce regional parking access for the hand-carry boat launch and the park
- Provide opportunities for access for education and recreation to the stormwater facility
- Improve connections from the regional shared-use path to the University of Washington



**Conceptual Rendering:** Looking northwest near the location where a hand-carry boat launch will be retained at the east side of the integrated stormwater treatment facility and adjacent to East Montlake Park

## What We Explored

- Explored stormwater treatment methods and configurations that visually and functionally blend with the surrounding context by: using native wetland plant materials, complementing East Montlake Park functions, creating a more organic form for facility shape, and providing paths and observation points for interaction by users
- Studied alternate locations for regional parking access that discourage the use of local streets
- Evaluated design configurations that provide viewpoints over and access within the facility
- Shielded the park from visual impacts of the lid and ramps with landscaped buffers
- Provided a safer bicycle/pedestrian route in the neighborhood by terminating 24th Avenue East at the north side of the lid and lowering the Montlake off-ramps under 24th Avenue East
- Improved the connection between the Shelby/Hamlin neighborhood and the Washington Park Arboretum under SR 520 mainline at Lake Washington shoreline
- Retained and enhanced existing hand-carry boat launch and explored need and locations for additional hand-carry boat facilities



## How Does This Work?

- Stormwater Inflows**
  - Drainage from approximately 24 acres of roadway through a piping system.
- Presettling Cell**
  - 5-foot depth open water basin with approximate .2 acre footprint OR a closed vault with the same capacity.
  - Highest concentrations of heavy metals and solids settle out in presettling cell.
  - Vehicular maintenance access required every 3-5 years to the bottom of the open water cell or to the top of a vault for removal of sediment.
- Constructed Wetland Cell**
  - Flat bottom basin, approximately .7 acres in size, with wetland plantings, which further treat for heavy metals and solids from water.
  - Water may be present for extended periods after storm events with a depth of approximately 18 inches.
  - Primary maintenance activities include control of unwanted plant species on an annual or biannual basis.
- Stormwater Outfall**
  - Water discharged to Union Bay via an open channel.
- Fire Suppression and Spill Containment Vault (Underground)**
  - Captures effluent liquids used to manage fires and spills in the Montlake Lid Tunnel.
  - Vehicular maintenance access required to top of vault following operation/testing
  - Periodic inspection of fire suppression and containment system.

# MONTLAKE SUBAREA: EAST MONTLAKE LID OPTION A

## Subarea Description

The SR 520 improvements east of 24th Avenue East include a landscaped lid covering the highway lanes below. Two options are being evaluated. The lid triggers substantial requirements for fire and life safety where it extends beyond 800 feet in length, including an operations and maintenance facility as well as emergency ventilation stacks and tunnel exits.

## Option A - High Transit/HOV Ramps

Lid Option A retains the 'high' transit/HOV lanes, which run along the surface of the lid. The transit/HOV lanes separate from the through lanes and rise over the Washington Park Arboretum wetlands area to meet a signalized intersection at 24th Avenue East.

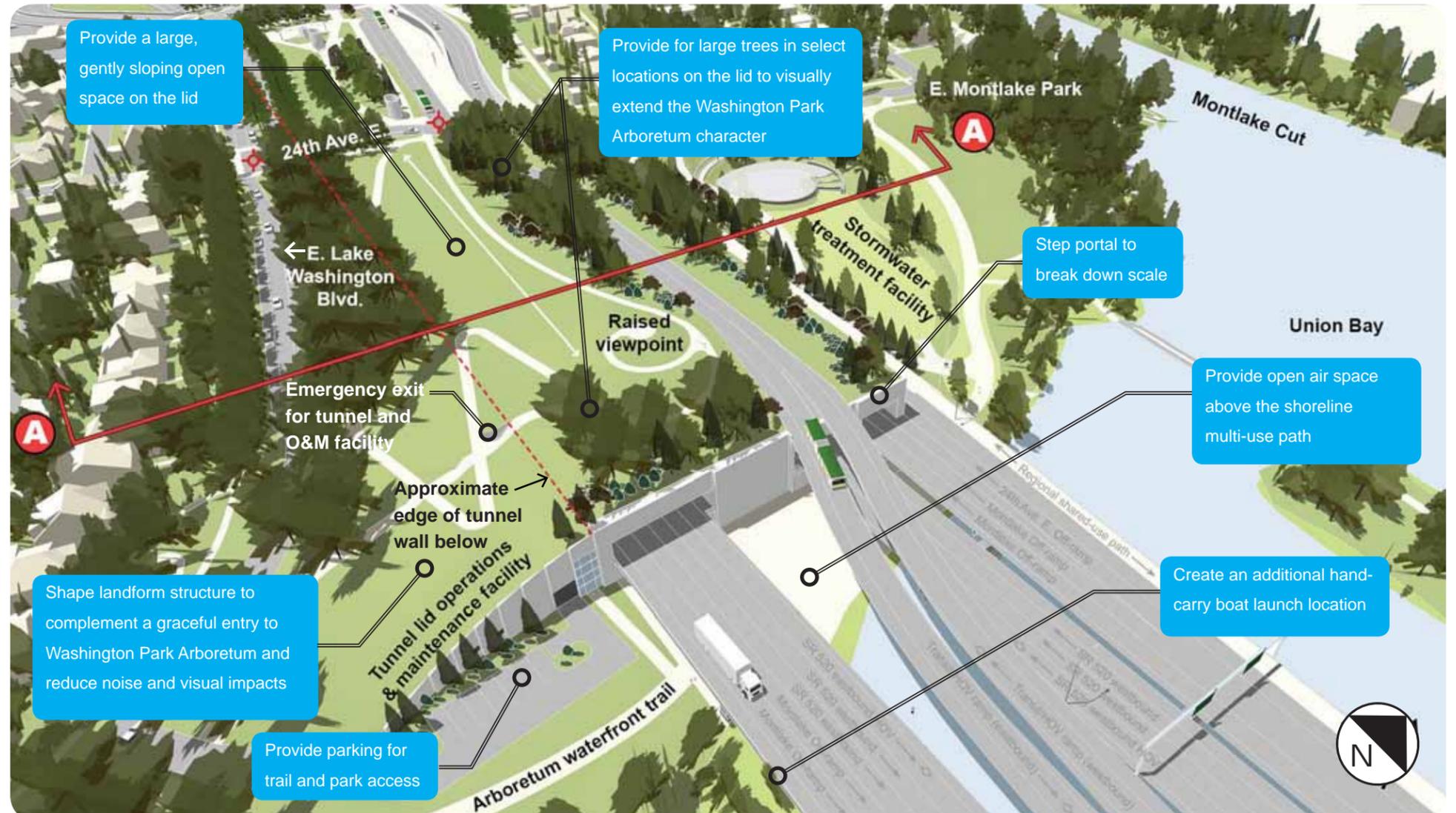
## Benefits

- Provides a contiguous space on the lid south of the transit/HOV off-ramps
- Provides open air space above the shoreline path

## Considerations

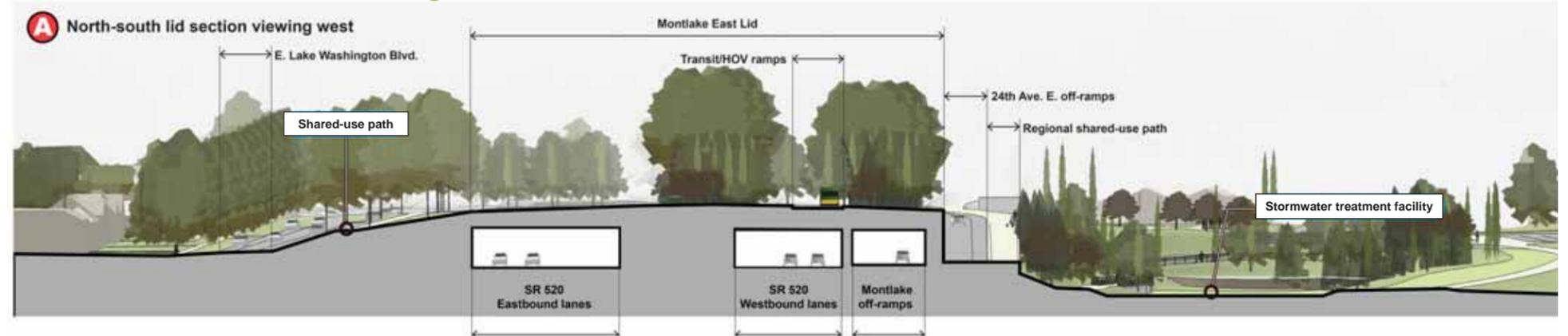
- The "high" transit/HOV ramps create greater visual impacts from surrounding vistas
- The transit/HOV lanes create a visual and physical barrier along the north edge of the lid

## Design Preferences



Bird's-eye view looking northwest

## North-south section looking west



East lid with Option A high Transit/HOV ramps



VIEW 1: The eastern portion of Montlake Lid Option A looking northeast toward the transit/HOV lanes and Union Bay



VIEW 2: Montlake Lid Option A showing the high transit/HOV ramp (looking north)

# MONTLAKE SUBAREA: EAST MONTLAKE LID OPTION B

## Subarea Description

The SR 520 improvements east of 24th Avenue East include a landscaped lid covering the highway lanes below. Two options are being evaluated. The lid triggers substantial requirements for fire and life safety where it extends beyond 800 feet in length, including an operations and maintenance facility as well as emergency ventilation stacks and tunnel exits.

## Option B - Lowered Transit/HOV Ramps

Lid Option B proposes lowered transit/HOV lanes moved south and coming to grade at 24th Avenue East through a slot in the east lid.

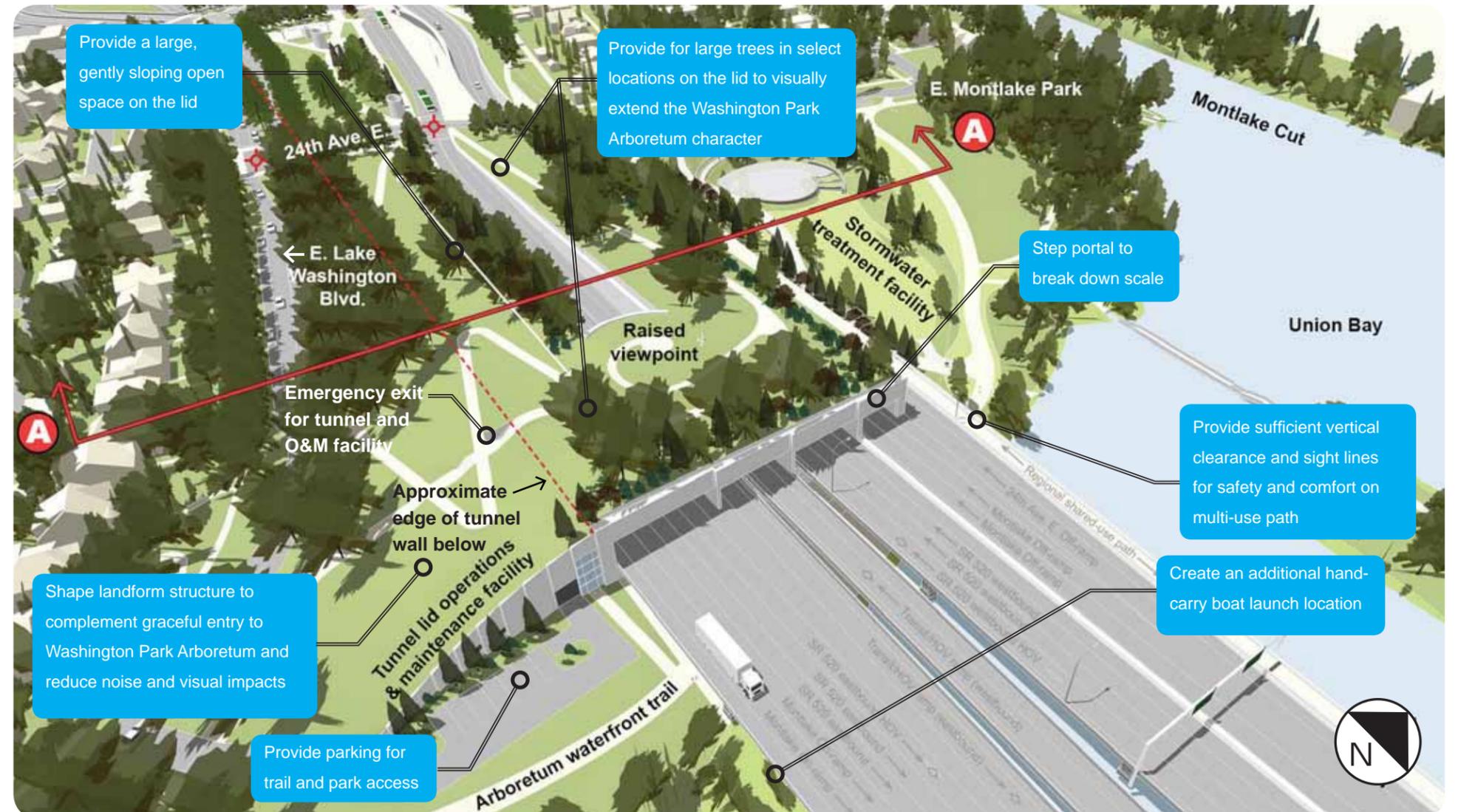
## Benefits

- Reduces the visual impact of the transit/HOV ramps at the east end of the lid
- Reduces the visual impact of the surface transit/HOV lanes on views toward Union Bay
- Allows for overlook viewpoints along the northeast portion of the lid
- The lowered transit/HOV lanes may result in less noise than on the lid (needs further evaluation)

## Considerations

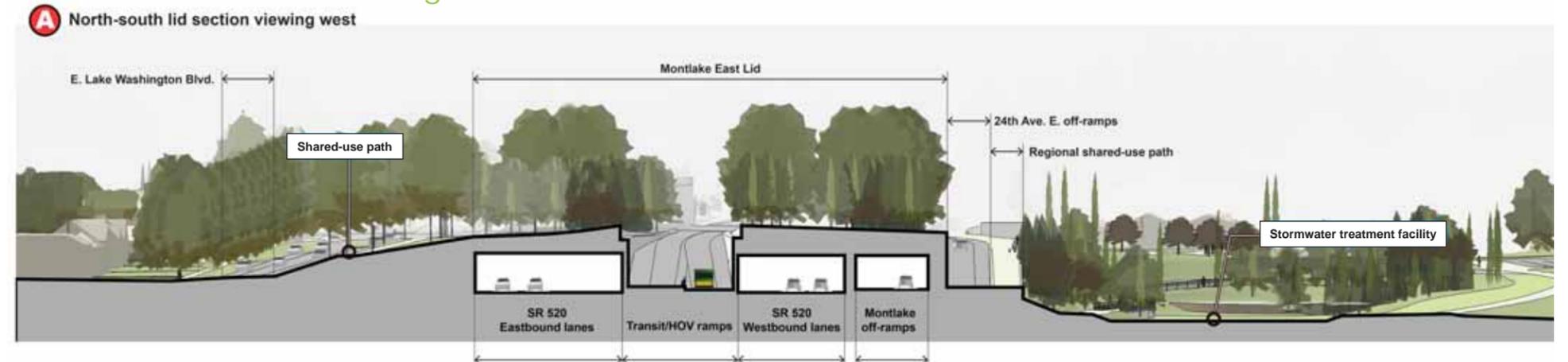
- The "slot" in the lid restricts opportunities for programmed uses or larger gatherings that would require a larger contiguous space

## Design Preferences



Bird's-eye view looking northwest

## North-south section looking west



East lid with Option B lowered Transit/HOV ramps



VIEW 1: The eastern portion of Montlake Lid Option B looking northeast toward the transit/HOV lanes and Union Bay



VIEW 2: Montlake Lid Option B showing the lowered transit/HOV ramp (looking north)

# MONTLAKE SUBAREA: EAST MONTLAKE LID OPTIONS COMPARISON

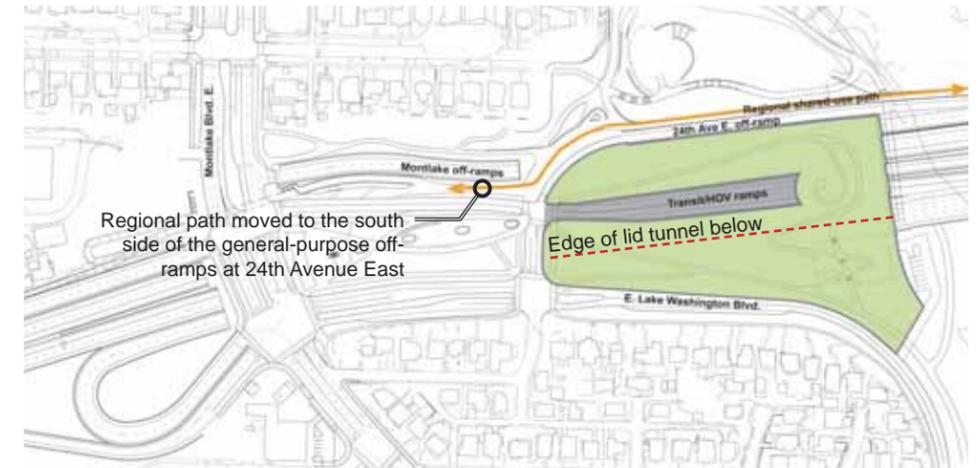
## Quantitative comparison of east lid design options



Baseline design configuration

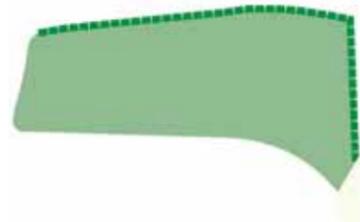


Option A - High Transit/HOV ramps (includes lid over lowered westbound off-ramp)

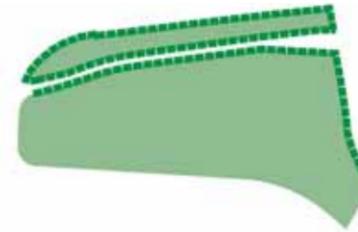


Option B - Lowered Transit/HOV ramps (includes lid over lowered westbound off-ramp)

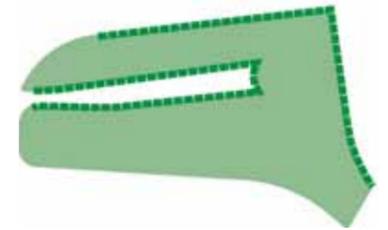
### Lid area/edges/barriers



### Lid area/edges/barriers

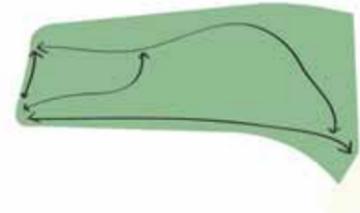


### Lid area/edges/barriers



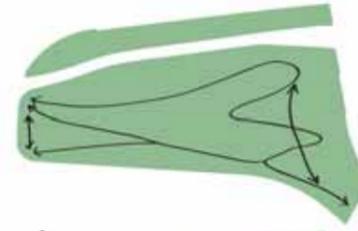
### Access/connections

Narrow and constrained connection between Canal Reserve and East Montlake Park/stormwater treatment facility with a 10-foot-high wall adjacent East Hamlin Street with limited view opportunities and no pedestrian access to the north



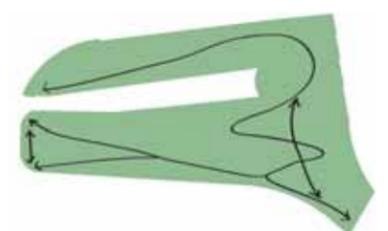
### Access/connections

Wider and more direct connection between Canal Reserve and East Montlake Park/stormwater treatment facility without adjacent wall but with limited view opportunities and no pedestrian access to the north



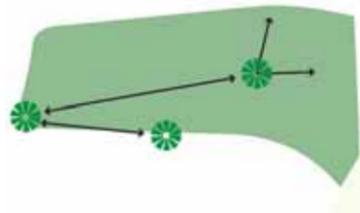
### Access/connections

Wider and more direct connection between Canal Reserve and East Montlake Park/stormwater treatment facility without adjacent wall but with limited view opportunities and no pedestrian access to the north



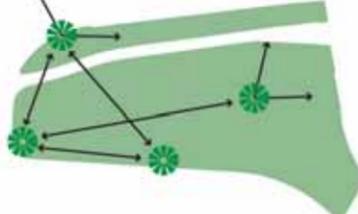
### Sight lines/views

North edge of lid is adjacent to five lanes of off-ramps



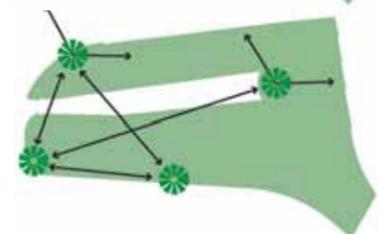
### Sight lines/views

North edge of lid is adjacent to two lanes of transit/HOV off-ramps with limited view opportunities and no pedestrian/bicycle access to the park



### Sight lines/views

North edge of lid directly overlooks East Montlake Park and Union Bay but provides no direct pedestrian/bicycle access to the park



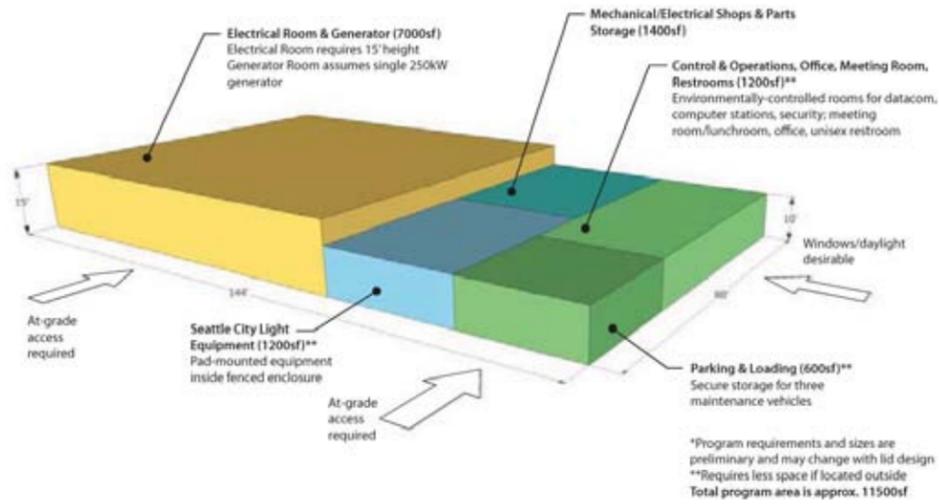
## What We Heard

- Fit the highway more gracefully into the shoreline landscape
- Create a safer, more pleasant and accessible shoreline experience, in particular adjacent the abutment under the bridge
- Make a safe shoreline multi-use path connection between East Montlake Park and the Washington Park Arboretum
- Provide continued access and enhancement of hand-carried boat launch
- Integrate the required Operations and Maintenance (O&M) facility into the lid landscape

## What We Explored

- Explored benefits and issues of high and lowered transit/HOV ramps
- Complemented and enhanced the surrounding natural environment by retaining existing significant trees, restoring shoreline and preserving maximum opportunities for new significant landscape on the lid
- Provided inviting, accommodating and safe pathways and open spaces
- Studied how to create viewpoints from the east lid to Lake Washington, the Cascade Mountains and Washington Park Arboretum
- Maintained or improved visual and noise buffers

## Operations and Maintenance Facility Program Summary\*



## Montlake Lid Operations and Maintenance Facility

Because the length of the Montlake lid is greater than 800 feet, it requires ventilation, fire and life safety equipment as well as an operations and maintenance facility, which houses mechanical, electrical and control spaces for tunnel operations.

The operations and maintenance facility has not yet been designed, but it will be located partially below grade to reduce visual impacts. Two potential locations for this facility were studied: 1) on top of the lid just east of 24th Avenue East, or 2) set into the slope at the southeast corner of the lid, which is the preferred location.

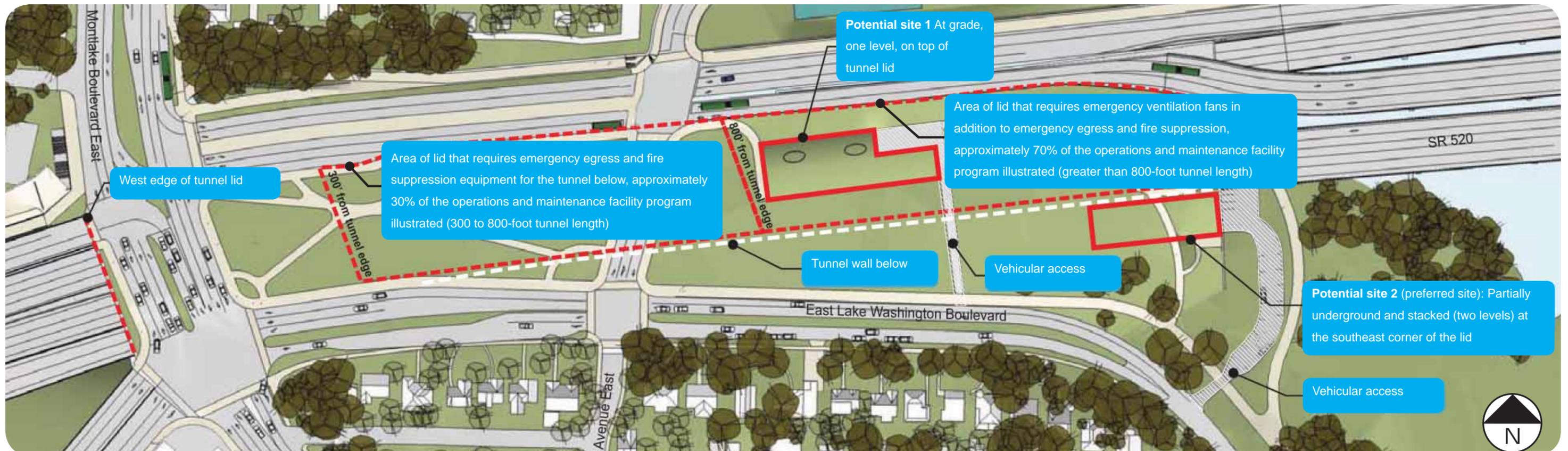
Other requirements of the lid and tunnel include a series of large vent stacks that need to be located on top of the lid. The project will continue to coordinate with Federal Highway Administration (FHWA) and the City of Seattle on additional specific requirements.

The design goals for the facility are to reduce visual impacts from East Lake Washington Boulevard and to integrate the building into the landscape at the southeast corner of the lid to the extent possible.

The operations and maintenance facility will serve the following functions:

- Contain electrical and mechanical equipment and shop space requirements of both regular and emergency ventilation for the tunnel under the lid as well as maintenance requirements of the west approach bridge
- Provide a minimum number of required office and work spaces for daily staff necessary for maintenance of the lid and west approach bridge

## Site Locations Considered for the Lid Operations and Maintenance Facility (Baseline Configuration)



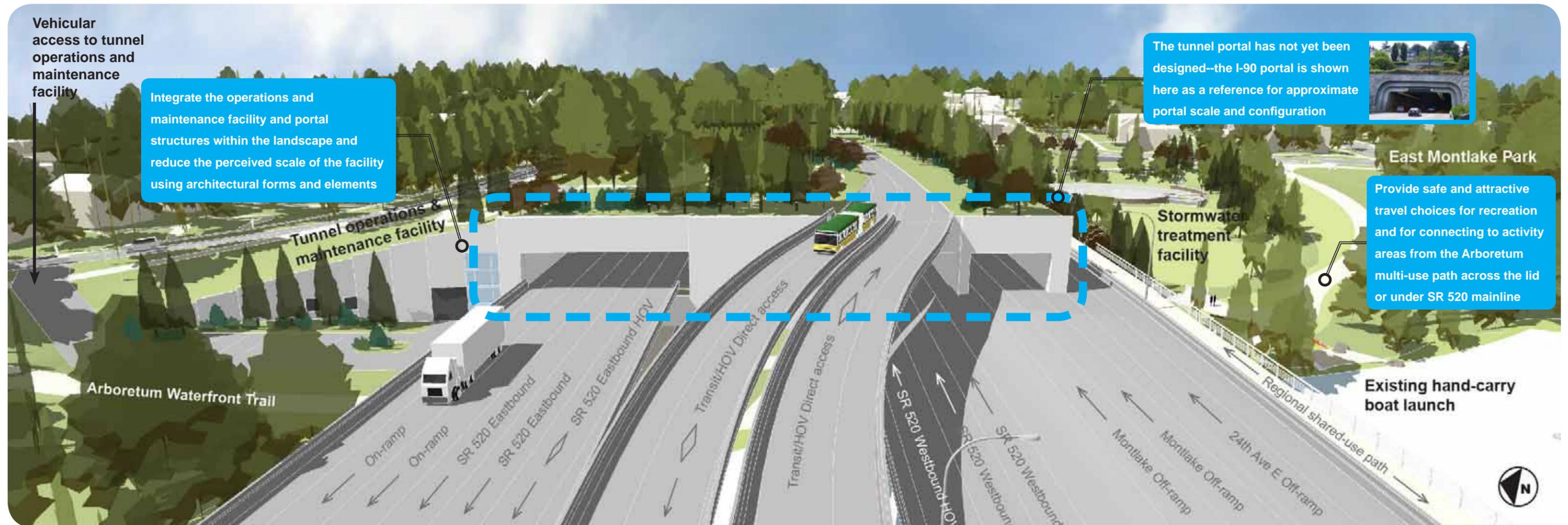
# MONTLAKE SUBAREA: EAST ENTRANCE TO MONTLAKE LID TUNNEL

## Subarea Description

The east entrance to the Montlake lid tunnel is located at the shoreline of Lake Washington and the west abutment of the West Approach Bridge. The proposed multi-use path at the shoreline creates a new connection, where one does not currently exist. The proposed path also completes the Arboretum Waterfront Trail loop detailed in the Washington Park Arboretum

master plan while providing safe and efficient connections to and from the adjacent neighborhoods, the Washington Park Arboretum and the University of Washington. This subarea is affected by the elevation of the transit/HOV ramps.

## Design Preferences: Option A - High Transit/HOV ramps (view looking west)



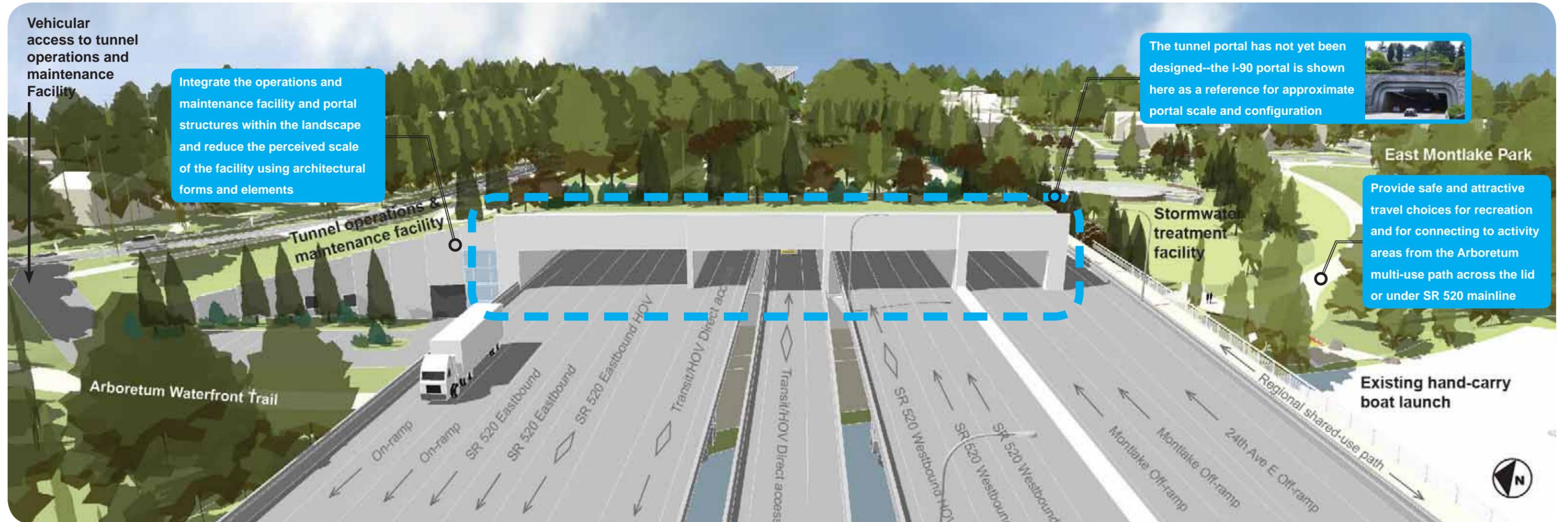
## What We Heard

- Make pathways safe and attractive for users
- Provide good sight lines for pedestrians walking along the shoreline under the bridge as well as appropriate lighting along the pathway
- Disperse parking for access to the park, water and trails on the north and south sides of the West Approach Bridge

## What We Explored

- Evaluated opportunities to increase sight lines entering and passing through the underbridge area
- Considered appropriate and sustainable uses for the underbridge area that could help increase security and visibility
- Maximized opportunities to provide landscape

## Design Preferences: Option B - lowered Transit/HOV ramps (view looking west)



# WEST APPROACH BRIDGE

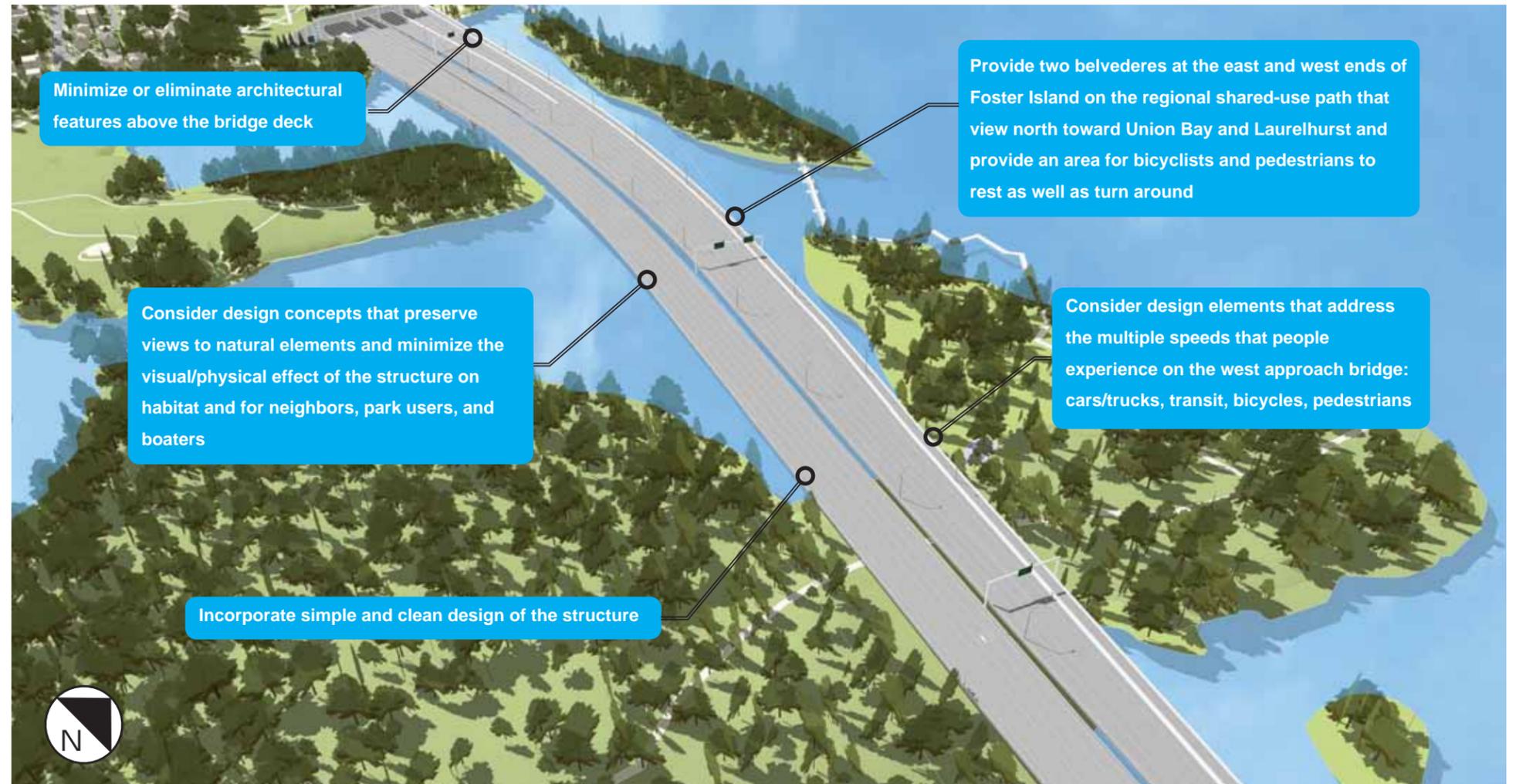
## Area Description

The West Approach bridge links the SR 520 floating bridge segment to the Seattle neighborhoods surrounding it. Because of the natural beauty of the west approach area, it is a destination for passive and active outdoor recreation such as boating, bird-watching, picnicking, strolling, and sports. The West Approach area includes a number of recreational activity centers including the Washington Park Arboretum and Marsh and Foster Islands, the University of Washington's Waterfront Activities Center, and McCurdy and East Montlake parks. These activity centers and parks provide a green, soft, yet defined vegetated edge to the bay.



Existing view of SR 520 West Approach Bridge looking west

## Design Preferences



Bird's-eye view of West Approach Bridge at Washington Park Arboretum and Foster Island looking northwest



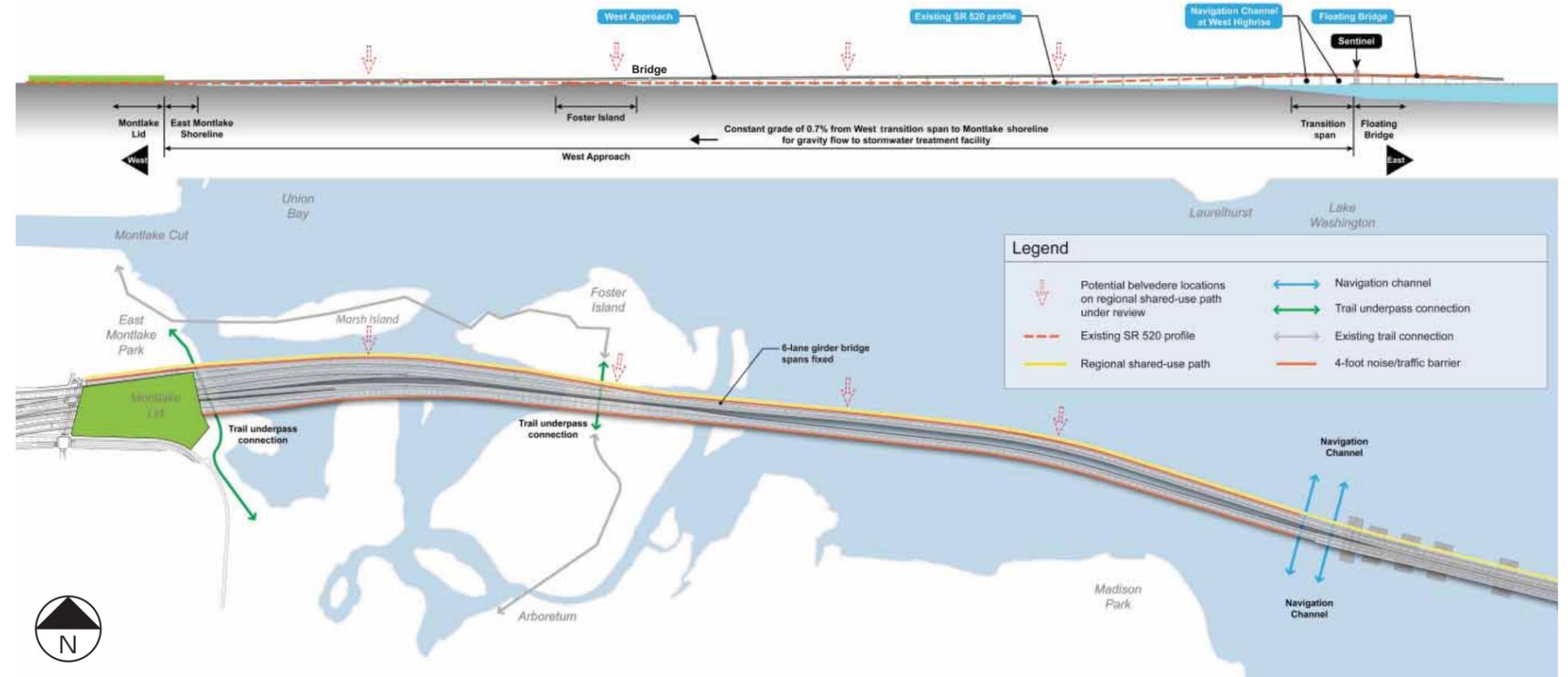
## What We Explored

- Explored solutions that integrate structural and system elements into a unified design concept
- Examined solutions that simplify bridge structure and components
- Studied belvedere locations that provide interesting views and a logical place to rest and/or turn around on the regional shared-use path



Existing view of SR 520 at Washington Park Arboretum looking east

### West Approach Bridge Conceptual Design Features



SR 520 regional shared-use path view looking east

## View from Laurelhurst

Comparable views of the existing West Approach bridge (top image) from the Laurelhurst neighborhood and how the same view would look with the proposed baseline design (bottom image).



View 1 key map



View 1 from Laurelhurst (existing)



View 1 from Laurelhurst (baseline design)



View 2 from Madison Park (existing)

### View from Madison Park

Comparable views of the existing west approach bridge (top image) from the Madison Park neighborhood and how the same view would look with the proposed baseline design (bottom image).



View 2 key map



View 2 from Madison Park (baseline design)



**Conceptual Rendering**

*View from 10th Avenue East and East Roanoke Street looking southeast*