SR 520 WEST SIDE

FINAL CONCEPT DESIGN

DRAFT - JANUARY 2015

City of Seattle

Washington State Department of Transportation

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01 EXECUTIVE SUMMARY

"This innovative and collaborative approach has produced context-sensitive infrastructure that is functional and reflects the needs, concerns, and voices of diverse and complex users, stakeholders, and community groups. We are hopeful that WSDOT will continue to implement this process on this and other projects."

- Memorandum: Recommendations for the Portage Bay Bridge and Montlake Lid components of the SR 520 Replacement Project, Seattle Design Commission September 17, 2014

City of Seattle Washington State Department of Transportation

EXECUTIVE SUMMARY

Introduction

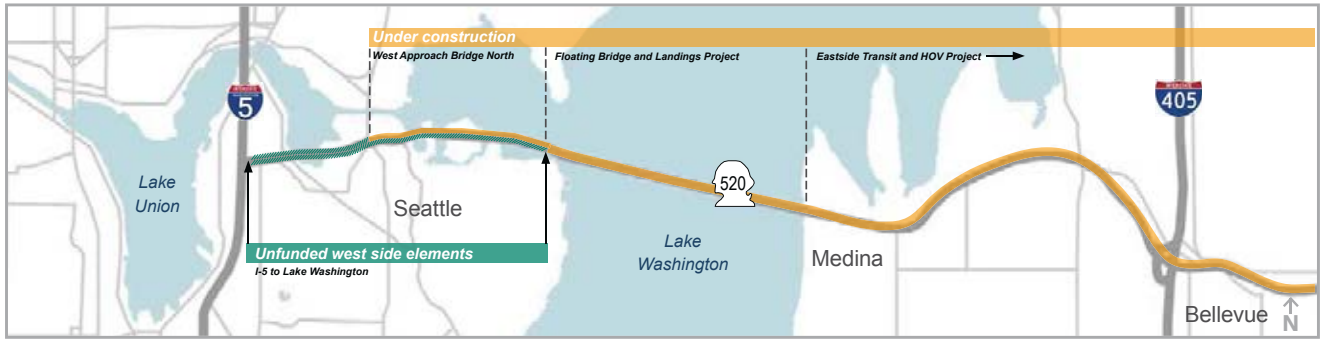
State Route (SR) 520 is a critical transportation link in Central Puget Sound, connecting major employment and population centers on both sides of Lake Washington via the world's longest floating bridge. The Washington State Department of Transportation (WSDOT) has been working with agency partners and the broader public since 1997 to plan, design, and build a safer, higher-capacity highway connecting Redmond to Interstate 5 (I-5) in Seattle.

Although SR 520 Bridge Replacement and HOV Project construction is underway throughout the corridor, improvements to a major portion of SR 520 – its western segment in Seattle – remain unfunded. Two of these unfunded elements, the Portage Bay Bridge and the West Approach Bridge South (WABS), are also vulnerable to earthquakes and must be replaced to safeguard the traveling public.

While the Final Concept Design for many Seattle-area elements was determined to be complete and was well-supported at the close of the Seattle Community Design Process (SCDP) in 2012, some work remained to explore and refine the Portage Bay Bridge, Montlake lid, and plans for bicycle, pedestrian, and transit connectivity within and around the corridor. WSDOT worked with the city of Seattle to further explore these areas in 2014.

Why is additional design work continuing in 2014?

In 2012, WSDOT launched the SCDP to refine the vision and design for the unfunded portions of the SR 520 project between I-5 and Lake Washington. The SCDP focused on intensive community and Seattle Design Commission outreach and input to help WSDOT refine design elements that interact directly with the surrounding neighborhoods and that will have a lasting effect on mobility in the city of Seattle and the surrounding region.



The SR 520 corridor extends from I-5 in Seattle to the east across Lake Washington. The I-5 to Lake Washington area, which is the focus of this document, remains unfunded.

At the conclusion of the SCDP in December 2012, final decisions had not been made regarding several key design features. Feedback was supported in some areas while split in others, and therefore further design work was identified by WSDOT and city of Seattle leaders to clarify strong solutions.

During the 2014 Legislative Session, the Washington State Legislature passed Engrossed Substitute Senate Bill (ESSB) 6001, which directed WSDOT to continue working with the Seattle Department of Transportation in the joint planning for, design of, outreach about, and operation of the remaining SR 520 west side elements, including:

- **The Montlake lid**
- **Bicycle and pedestrian connectivity**
- **The effective network of transit connections**
- **The Portage Bay Bridge**

Throughout the summer of 2014, WSDOT fulfilled this directive by working closely with the city of Seattle, a team of design professionals, and the Seattle Design Commission to develop design recommendations for these remaining unfunded elements. The work builds directly upon previous project design refinements and aligns with all project permits, regulatory approvals, and stakeholder commitments. The Final Concept Design graphic on pp. 4-5 describes design recommendations endorsed during the SCDP in 2012 as well as improvements added through the 2014 design effort.

How were stakeholders and the public engaged?

Recommendations in this report build from and reflect the public input received during the 2012 Seattle Community Design Process. Because ESSB 6001 is focused on decision-making, WSDOT and the city of Seattle determined that the appropriate way for the public to provide feedback was through existing public forums, specifically at Seattle City Council and Seattle Design Commission meetings. At these meetings, community members had the opportunity to provide input directly to decision-makers. WSDOT and the city offered additional opportunities to learn about the design process and provide feedback through a public open house and smaller community group briefings. WSDOT and the city will also host a public comment period on this draft report. Specific engagement activities and a general summary of public input are provided on pp. 14-15 and in Appendix D.

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Overall project vision: Nature Meets City

The SR 520 project continues to be guided by the overall project vision of "Nature meets City." For more on the project vision, see p. 19.

The SR 520 project corridor will be a sequence of gateways to Seattle that reconnect green networks established in the city's early planning.

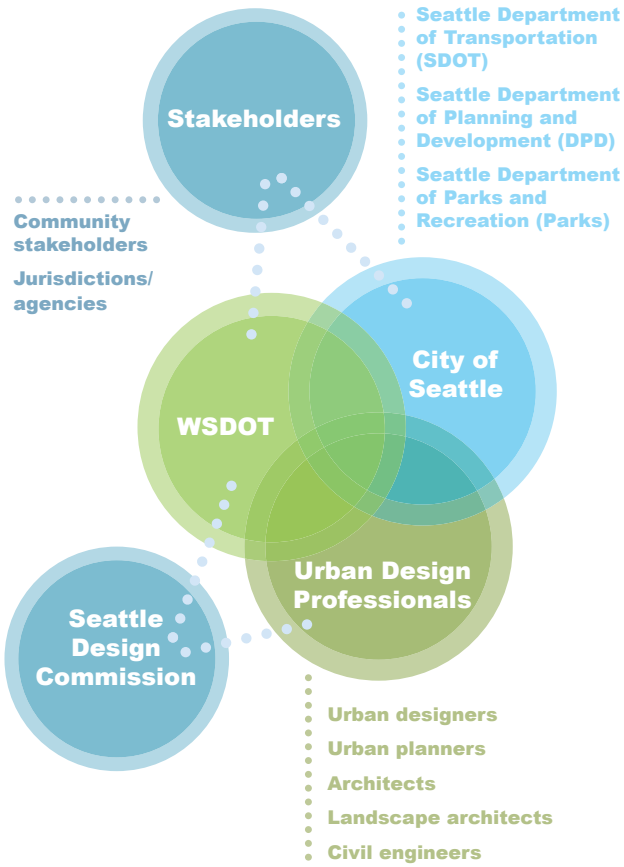
Unfunded west side elements: The Rest of the West

Planned but unfunded improvements between I-5 and Lake Washington include:

- A seismically stronger Portage Bay Bridge, which is currently vulnerable to earthquakes.
- Community-connecting highway lids at Montlake Boulevard and 10th Avenue East/Delmar Drive East.
- A new, seismically stronger West Approach Bridge South to carry three lanes of eastbound traffic past Montlake Boulevard to the new floating bridge.
- A new, second bascule bridge across the Montlake Cut to provide additional capacity and safer travel.
- A 30-foot-wide landscaped bicycle and pedestrian shared-use path over I-5.
- Six travel lanes, including transit/HOV lanes, from Redmond to I-5.
- Related mitigation projects, including aquatic mitigation at Taylor Creek and Seward Park, aquatic and wetland mitigation at Magnuson Park, landscaping enhancements on Foster Island, a new Arboretum North Entry, trail improvements in the Portage Bay area, community construction management plans for future construction phases, historic documentation and interpretive signage.

2014 Design collaboration partnership

The city of Seattle and WSDOT worked together with a team of jointly-hired urban design professionals, the Seattle Design Commission, and community stakeholders to refine the project design.



Final Concept Design: Urban trailhead on the Montlake lid and transit connections.

What is in this document?

This report shares the progress that WSDOT and the city of Seattle have made together during 2014 to develop design recommendations for SR 520's key infrastructure and multimodal connections between I-5 and Montlake. The following chapters highlight this progress:

- **Design progression to date,** including an overview of the many processes and stakeholders WSDOT has worked with to develop the project's Preliminary and Conceptual Designs.
- The **design work completed in 2014,** including a refined vision and goals, concepts explored, and final design recommendations for the following focus areas:
  - **Non-motorized connections** on and around the SR 520 corridor in Seattle;
  - **Portage Bay Bridge** type, alignment, and options for a shared-use path; and
  - **Montlake lid** and nearby pedestrian and bicycle connections.
- **Next steps** for Final Design and for WSDOT to secure funding to complete the SR 520 corridor in Seattle.

Final Concept Design

The 2014 design work built upon the design preferences confirmed at the conclusion of the 2012 SCDP. Elements identified as needing more work were refined in 2014, resulting in a cohesive set of design recommendations for the project, illustrated here.

This graphic represents a summary of the design refinements and recommendations that constitute the Final Concept Design. These design recommendations take into account the environmental footprint, conceptual design features and previous project commitments that were approved in the 2011 SR 520, I-5 to Medina Bridge Replacement and HOV Project Federal Highway Administration Record of Decision.

2014 Final Concept Design Recommendations

WSDOT and city staff are aligned in their support of the design recommendations depicted in the graphic on these pages and detailed in this report. Once these recommendations are endorsed by decision makers – Seattle City Council, the Mayor and WSDOT leadership – and funded by the legislature, WSDOT and the city will be ready to advance delivery of the remaining SR 520 improvements to meet the needs of the local community and larger Puget Sound region while replacing vulnerable structures to safeguard the traveling public.

Key

- Regional shared-use path
- Sidewalk/pedestrian path
- SCDP design preferences (became recommendations with city of Seattle Resolution 31427 in 2012)
- 2014 Final Concept Design recommendations

Roanoke area

Portage Bay Bridge

Roanoke area

1. **I-5 crossing:** Design a new 30-foot-wide landscaped bicycle and pedestrian shared-use path.
2. **Intersection design:** Improve the "T" intersection design at 10th Avenue East and Delmar Drive East.
3. **10th and Delmar lid:** Support passive uses as well as bicycle and pedestrian shared-use paths on the lid; balance tree preservation and safe public spaces by blending the lid into the hillside.
4. **Bagley viewpoint:** Expand Bagley Viewpoint and provide street parking on Delmar Drive East.
5. **Boyer connection:** Provide a new, accessible and safe pedestrian connection between Delmar Drive East and Boyer Avenue East.

Portage Bay Bridge

6. **Bridge alignment:** Shift the alignment to the north on the west end of the bridge in order to reduce construction duration, among other benefits.
7. **Bridge type:** A box girder bridge type split into two parallel structures is favored. Raise the profile of the bridge on the east end to allow for longer spans.
8. **Bicycle and pedestrian connections:** Include a shared-use path on the south side of the Portage Bay Bridge in addition to other connectivity options to existing and planned city networks.

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Montlake area

West Approach Bridge

Montlake area

9 **Bill Dawson Trail:** Realign the Bill Dawson Trail to improve sight lines and user experience. Provide multiple options for connecting to adjacent networks via paths and stairs.

10 **Montlake Boulevard East:** Continue to work with the city of Seattle and King County Metro to improve safety, wayfinding, visual character and experience for cyclists and pedestrians.

11 **Canal Reserve:** Lower the westbound off-ramps under 24th Avenue East. Shift the regional shared-use path onto the lid to preserve trees and open space in the Canal Reserve.

12 **Urban trailhead:** Develop an urban trailhead and mobility hub with transit, bicycle and pedestrian facilities, safe and comfortable connections, and space for community activity.

13 **East Lake Washington Boulevard:** Design the roadway to buffer neighbors from traffic, improve visual character and integrate with the Washington Park Arboretum by increasing the planted buffer between the roadway and the homes on the south side of the boulevard.

14 **24th Avenue East off-ramp**: Prohibit direct vehicular access to East Montlake Park from the 24th Avenue East off-ramp.

15 **Stormwater facilities:** Continue to integrate constructed wetland facilities into the existing East Montlake Park and shoreline area.

16 **Montlake land bridge:** Create a smarter lid that emphasizes better connections, more usable open space, buffered views of the roadway, an improved pedestrian experience, and safer undercrossings. The approximately 70-foot-wide land bridge provides an at-grade connection between the Washington Park Arboretum and East Montlake Park.

17 **Montlake Cut:** Improve multimodal connections across the Montlake Cut.

West Approach Bridge

18 **East undercrossing:** Develop a new undercrossing that extends the Arboretum Waterfront Trail under SR 520 at the Lake Washington shoreline. Restore the shoreline wetland habitat. *Pathway alignment subject to further study by WSDOT and the city of Seattle.*

19 **Bridge design:** Work toward a simple and clean structural design; include belvedere viewing areas for the regional shared-use path on the north side of the bridge. *Construction of the West Approach Bridge North began in Fall 2014.*

Non-motorized connectivity network

During 2014, the WSDOT design team worked collaboratively with the city of Seattle to refine the vision and goals for non-motorized facilities based on ongoing public input, Seattle Design Commission recommendations, and design team discussions. They focused specifically on areas for which concepts had not been fully resolved during the 2012 Seattle Community Design Process (SCDP) and developed a series of recommendations to guide additional design consideration for those identified areas. The efforts of the work group are documented in the *Non-motorized Connectivity Technical White Paper* (see Appendix B).

The exhibit on these pages illustrates a summary of the design refinements and recommendations that inform the Final Concept Design for the network of non-motorized connections in and around the project area. It also demonstrates the joint efforts of WSDOT, the city of Seattle and stakeholders to develop an intuitive, comfortable, efficient and safe non-motorized network within the SR 520 west side project corridor and transitions to existing and proposed facilities in the city of Seattle.

2014 Non-motorized connectivity recommendations

WSDOT and city staff are aligned in their support of the design recommendations depicted in this exhibit and the associated *Non-motorized Connectivity Technical White Paper* (see Appendix B). Once endorsed by decision makers – Seattle City Council, the Mayor and WSDOT leadership – and funded by the Washington State legislature, WSDOT and the city will be ready to advance delivery of the remaining SR 520 non-motorized improvements to meet the needs of the local community and larger Puget Sound region, while replacing vulnerable structures to safeguard the traveling public.

Roanoke area

8 Create a new, safe and comfortable undercrossing at 10th Avenue East connecting the 10th and Delmar lid shared-use path to Broadway Avenue East and the Harvard Avenue East neighborhood greenway to downtown Seattle.

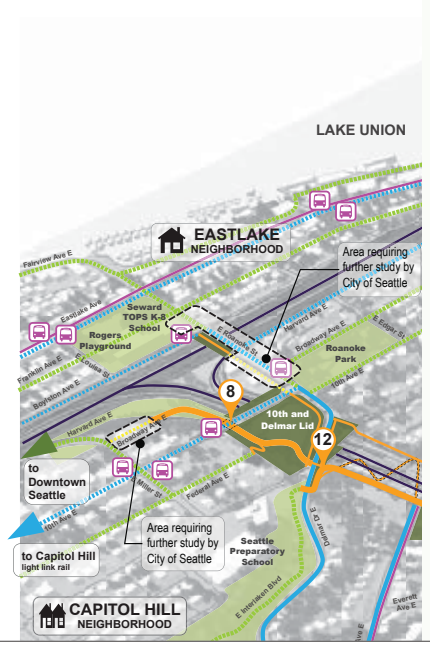
Portage Bay Bridge area

1 Provide an accessible non-motorized path on the south side of Portage Bay Bridge that completes the regional shared-use path from Eastside communities to I-5 in Seattle.

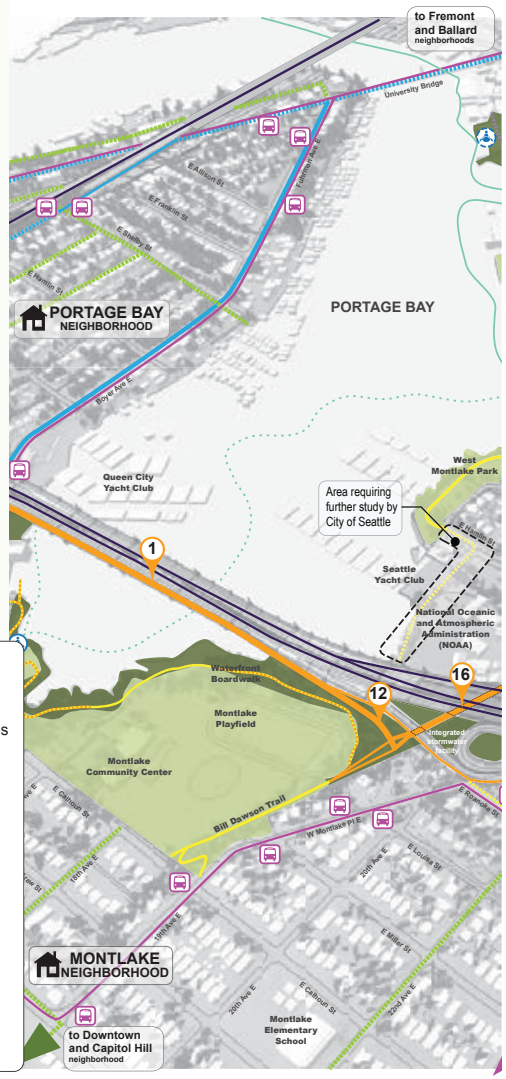
12 Design architecturally-integrated at-grade and separated connections to and from the shared-use path on the Portage Bay Bridge to provide safe, intuitive and comfortable options for pedestrians and cyclists.

16 Straighten and widen the Bill Dawson Trail alignment for improved comfort, safety and sight lines. Provide separation of cyclists and pedestrians using distinctive surfacing.

Roanoke Area



Portage Bay Bridge



Key

- SR 520 Program planned
- SR 520 Program planned undercrossing
- City of Seattle improvements funded by WSDOT (work by others)
- Existing city of Seattle on-street bicycle route (bike lane, shared street)
- Recommended/proposed city of Seattle bicycle routes (bike lane, cycle track, shared street)
- Existing and proposed city of Seattle neighborhood greenway
- Existing city of Seattle non-motorized facility (sidewalk, path, shared-use path)
- Recommended/proposed non-motorized facility (greenway, on-street, cycle track, shared-use, sidewalk)
- Existing green networks
- Project-proposed green network enhancement
- Existing UW non-motorized facility (sidewalk, path)
- Recommended facility in 2014 Bicycle Master Plan on UW campus, or bicycle/pedestrian facility in UW Campus Master Plan/Campus Landscape Framework Plan
- Local transit routes
- Regional transit routes serving SR 520 corridor
- Existing WA Water Trails Association water trail
- Proposed water trail
- Existing hand-carried boat launch
- WSDOT-led improvement
- City-led improvement
- UW-led improvement

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Montlake Area

West Approach Bridge

Montlake area

19 Create a new undercrossing at Montlake Boulevard East for safe pedestrian and bicycle crossing and the connection of the regional shared-use path from the urban trailhead to Bill Dawson Trail and Portage Bay Bridge. Provide separation of cyclists and pedestrians using distinctive surfacing.

21 21 Provide raised crosswalks or distinctive surface treatments at crossings to improve wayfinding, enhance bicycle and pedestrian safety, provide vehicle traffic calming and reinforce the Olmsted boulevard character.

22 Coordinate on a University of Washington-developed waterfront recreational trail to provide bicycle and pedestrian access along Portage Bay and the Montlake Cut with connections under Montlake Boulevard East to Walla Walla Lane.

25 Shorten pedestrian crossings by narrowing lanes and eliminating free vehicle movements with signalized intersections to enhance safety, comfort and traffic calming.

26 Improve the pedestrian experience at the interchange over the SR 520 mainline by widening the path on both sides of Montlake Boulevard East and enhancing the portal edge on the west side of the street with planted buffers along path edges.

27 Continue ongoing refinement of proposed improvements to connections along the west side of Montlake Boulevard East. If existing physical constraints change in the future, WSDOT and the city of Seattle will pursue other opportunities to further improve conditions for pedestrians and cyclists.

31 Develop a safe, separated and direct multi-use connection from the Portage Bay Bridge along the north side of East Roanoke Street to Montlake Boulevard East.

32 Reconfigure the intersection at East Roanoke Street and East Montlake Place East for improved legibility and traffic calming and a safer and more direct connection between Montlake neighborhood greenways.

35 Provide signed intersections at the 24th Avenue East off-ramp and East Lake Washington Boulevard to enhance bicycle and pedestrian safety, provide vehicle traffic calming and reinforce the Olmsted boulevard character and neighborhood scale.

36 Create a new, non-motorized land bridge east of 24th Avenue East, which provides a quality, efficient and barrier-free north-south crossing over SR 520, safely connecting the Washington Park Arboretum, East Montlake Park and access to transit.

West Approach Bridge

37 Develop a new undercrossing that extends the Arboretum Waterfront Trail under SR 520 at the Lake Washington shoreline and provides additional comfortable and safe pedestrian connections to the Arboretum. *The Arboretum pathway alignment as illustrated in this report is one potential solution for this important non-motorized connection; specific landing points and layout are subject to further study by WSDOT and the city of Seattle.*

Design progression of the SR 520, I-5 to Medina Project*

**See Appendix C for more information on each phase of the design progression.*

2006 - 2011

PRELIMINARY DESIGN: Identifying, analyzing, refining and selecting a project alternative.

- **2006 Draft Environmental Impact Statement:** Identifying a preliminary range of alternatives.
- **2008 Mediation Process:** Identifying several six-lane alternatives.
- **2010 Supplemental Draft Environmental Impact Statement**: Analyzing alternatives and selecting a Preferred Alternative.
- **2010 ESSB 6392 Workgroup**: Refining the Preferred Alternative.
- **2011 Final Environmental Impact Statement**: Incorporating the Preferred Alternative refinements.
- **2011 Record of Decision:** Approving the Preferred Alternative.

2011 - 2014

CONCEPTUAL DESIGN: Refining the Preferred Alternative within the framework established by the Environmental Impact Statement.

- **2011 - 2012 Seattle Community Design Process:** Refining the Preferred Alternative.
- **2014 ESSB 6001:** Completing the Final Concept Design for the Preferred Alternative.

Winter 2014

Where we are today

FINAL DESIGN

CONSTRUCTION

Unfunded next steps:

FINAL DESIGN: Completing final design and preparing construction contracts.

CONSTRUCTION: Building project improvements.

Design work to date

Project delivery includes three design phases leading to construction: preliminary, conceptual, and final design. The evolution of the SR 520 corridor design in Seattle is described below according to these categories (also see design progression timeline above).

Preliminary design

For many years, WSDOT has worked with agency partners, key stakeholders, and the broader public to identify, analyze, refine and select the project's Preferred Alternative.

Conceptual design

Upon federal approval in 2011, the Preferred Alternative became the project's Preliminary Concept Design and WSDOT began working with their partners, key stakeholders and the broader public to refine the project's design by focusing on community aspects of the Preferred Alternative. The 2011-2012 SCDP and the 2014 design effort are considered to be refinements within the conceptual design phase.

Final design

As west side project elements receive funding, WSDOT will continue to work with the city of Seattle and key stakeholders, including the Seattle Design Commission and the broader public, to complete Final Design in order to inform contract documents and prepare for project construction. The Final Concept Design will undergo environmental review and existing environmental documents will be updated as necessary to implement the proposed design. No new significant environmental impacts are anticipated as a result of the design refinements.

Next steps: Funding and construction

The Final Concept Design recommendations and updated project cost estimates will be presented to the Seattle City Council in early 2015 to inform their guidance and potential endorsement. The Seattle City Council may choose to formalize this guidance in a resolution. WSDOT will also present the results of this process, revised design plans, and updated cost estimates for the Final Concept Design to the State Legislature for funding consideration. When additional project funding is obtained, WSDOT will work with the city and other partners to finalize design, prepare for construction, and complete project delivery.

Final Concept Design: Montlake Boulevard East pedestrian and bicycle undercrossing.

A full version of this document
SR 520 West Side Final Concept Design report
is available here:
www.wsdot.wa.gov/projects/SR520bridge/library/technical.htm#misc

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City of Seattle

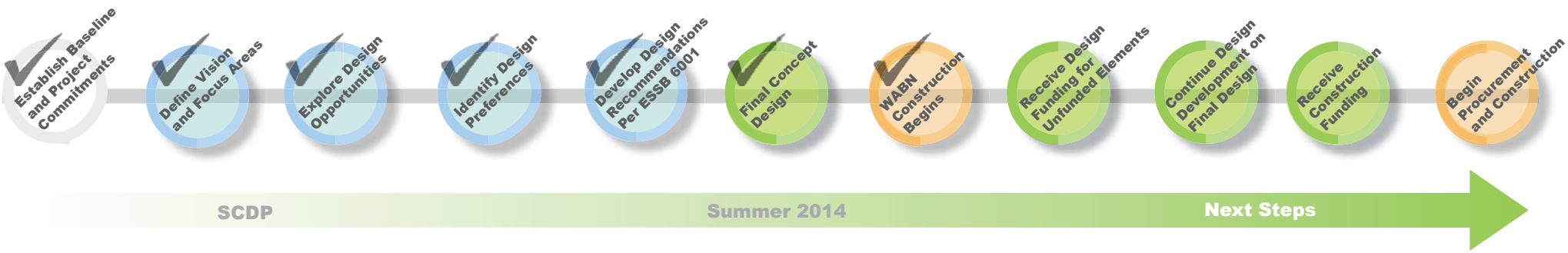
02 DESIGN PROGRESSION OVERVIEW

"The Washington State Department of Transportation's vision is to be the best in providing a sustainable and integrated multimodal transportation system."

Results WSDOT: Moving Washington Forward

WSDOT Strategic Plan, 2014 - 2017

DESIGN PROGRESSION



Design progression overview

The recommendations in this report, when endorsed by key decision-makers, will complete final conceptual design for the entire SR 520 corridor in Seattle. This chapter provides an overview of how the SR 520 project corridor design has evolved in Seattle over time. Additional detail is provided about:

- **Project context and history:** What is the purpose and need for the project, and what is the current status of program delivery?
- **WSDOT/city of Seattle collaboration:** How have WSDOT and the city worked together to advance corridor design and support project delivery?
- **Preliminary design:** How did WSDOT analyze alternatives, develop preliminary designs, select a preferred option, and move forward with a conceptual design?
- **Conceptual design refinements:** How has the Preferred Alternative been refined in Seattle? How have the public and key stakeholders been involved?
- **Final design and beyond:** With the Final Concept Design likely identified by the end of 2014, what are the next steps for the SR 520 project in Seattle?
- **Public involvement:** How has public input influenced the SR 520 corridor design in Seattle?

Project context and history

SR 520 is a critical transportation link in Central Puget Sound, connecting major employment and population centers on both sides of Lake Washington via the world's longest floating bridge. In 2013, an average of 70,000 vehicles crossed the SR 520 bridge on weekdays. (This volume meets projections for the corridor after tolling was implemented and aligns with the project's finance plan.) WSDOT is now building a safer, higher-capacity highway. Work underway includes:

- Building a six-lane corridor from Medina to I-405, with transit/HOV lanes in both directions, a regional bicycle and pedestrian path, and new lids at Evergreen Point Road, 84th Avenue Northeast and 92nd Avenue Northeast, two of which have median transit stops; **opens late 2014.**
- Replacing the half-century-old, structurally vulnerable floating bridge with a stronger, safer, six-lane bridge; **opens spring 2016.**
- Constructing a stronger, safer West Approach Bridge for westbound traffic and providing a six-lane corridor to Montlake, including transit and HOV from Redmond to Montlake; **north half opens summer 2017.**
- Improving transportation options for transit riders, bicyclists and pedestrians, including a regional, cross-lake bicycle and pedestrian path on the north side of the bridge; **opens summer 2017.**

However, improvements to a major portion of SR 520 – its western segment in Seattle – remain unfunded.

WSDOT/city of Seattle collaboration

The city of Seattle has always been an important and active partner in the SR 520 Program, participating in regulatory coordination efforts, executive oversight groups, mediation processes, and working groups. Seattle neighborhood and resident feedback has also been crucial to shaping the project's current design by sharing community preferences, providing comments on analysis and interim designs, and otherwise engaging in project activities.

In 2011, the relationship between WSDOT and the city was formalized in a Memorandum of Understanding (MOU). The ultimate purpose of the MOU was to acknowledge the Preferred Alternative and expedite project delivery in Seattle while clarifying agency roles and responsibilities, mitigation commitments, and establishing a structure for addressing remaining project questions. Through this formalized commitment to work together, the city and WSDOT agreed to collaborate to fund, refine the design of, and construct the "Rest of the West."

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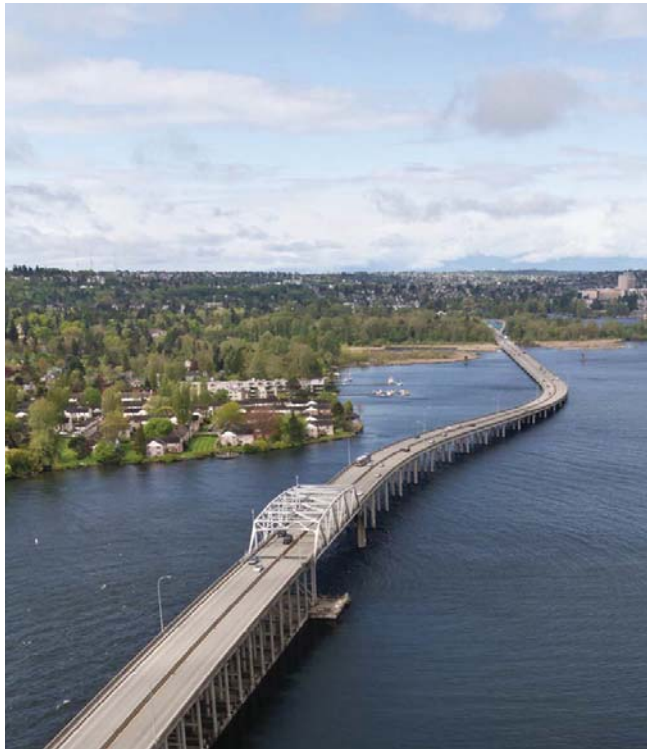
Seattle/SR 520 project 2011 MOU purposes:

- **Confirm the Preferred Alternative and seek full funding:** Acknowledge the Preferred Alternative, for which WSDOT is seeking full funding from the State Legislature and other funding sources to build all program elements.
- **Commit to key design elements and their delivery:** Secure WSDOT's commitment on key design elements and intent to build them.
- **Clarify decision-making regarding a second bascule bridge:** Establish an understanding related to the decision and timing to construct a second bascule bridge crossing the Montlake Cut.
- **Clarify mitigation commitments:** Clarify mitigation commitments WSDOT has agreed to implement to meet the city's goals and objectives for the project.
- **Maintain a meaningful city role throughout design:** Ensure the city maintains a meaningful role throughout the project design process.
- **Ensure city involvement for the project's duration:** Ensure the city's continued involvement for the duration of the project.
- **Mutually commit to meet timelines for project delivery:** Establish the city's and WSDOT's intent to endeavor to meet SR 520 timelines for project completion.



View of SR 520, looking west. The bridge transitions from a floating structure to a fixed structure on the west side of Lake Washington as it approaches Seattle.

Recent design history overview:

October 2011
WSDOT/city of Seattle Memorandum of Understanding
WSDOT and city of Seattle's commitment to work together to identify funding, refine the design and construct the Preferred Alternative.

Fall 2011 – Fall 2012
Seattle Community Design Process (SCDP)
Public process to refine the Seattle side of the SR 520 corridor.

February 2013
Seattle Resolution 31427
Council resolution regarding design preferences identified during the SCDP.

April 2014
ESSB 6001
Directs WSDOT to continue working with the city of Seattle on the design of key elements of the Seattle corridor.

2014
Where we are today
WSDOT, city of Seattle and design professionals further refine key elements of the Seattle side of the corridor.

See pp. 12-15 and Appendix C for further detail on each of these project milestones.

Preliminary design: Selecting the Preferred Alternative

For many years, WSDOT has been analyzing alternatives for the SR 520 corridor and working with agency partners and public stakeholders to select and refine a preliminary design.

- **Identifying a Preferred Alternative:** WSDOT analyzed more than a dozen alignment alternatives as the agency developed the project's environmental impact statement (EIS). Based on analysis and feedback received through the Draft EIS (2006), community mediation process (2008), Supplemental Draft EIS (2010), and Final EIS (2011), WSDOT defined a Preferred Alternative for the corridor from Medina to I-5.
- **Refining the Preferred Alternative:** WSDOT worked to refine components of the Preferred Alternative - including design refinements, transit connections, planning and financing - through a legislative workgroup (2009). The process helped WSDOT ensure that the Preferred Alternative reflected the requirements and preferences of key constituents.
- **Approving the Preferred Alternative:** The Federal Highway Administration approved the Preferred Alternative with a Record of Decision published in August 2011.

See Appendix C for more details on how WSDOT narrowed to a Preferred Alternative, and how it was further refined through agency and stakeholder processes.

Conceptual design refinements: Refining SR 520 in Seattle

After approval of the Preferred Alternative, WSDOT engaged in two major processes, the 2011-2012 SCDP and the 2014 West Side Design Refinements, to further refine the conceptual design of Seattle-area SR 520 elements.

2011 - 2012 Seattle Community Design Process. In 2011, WSDOT launched the Seattle Community Design Process (SCDP), a robust public and stakeholder process to refine the corridor vision and conceptual design for the unfunded portions of the SR 520 project in Seattle. Through this effort, WSDOT and the city of Seattle identified many well-supported design preferences that were endorsed by Seattle City Council as well as areas requiring further exploration. The city of Seattle formalized their guidance in Resolution 31427 in early 2013, and WSDOT incorporated those endorsed design elements into the SR 520 conceptual design. See pp. 14-15 for more information on the SCDP.

Approximately 344 people attended a September 2014 project open house in Seattle.

WSDOT staff answer questions at the September 2014 open house.

WE ARE HERE!

2014 West Side Design Refinements. In April 2014, state lawmakers directed WSDOT (via Engrossed Substitute Senate Bill 6001) to continue working with the city of Seattle to build from the results of the SCDP. WSDOT and the city were charged with making design recommendations for the Seattle-area elements that were not resolved during the SCDP and seeking public comment on resulting recommendations.

A team of design professionals, in consultation with the Seattle Design Commission and supported by city and WSDOT staff, explored design solutions for the following areas:

- Portage Bay Bridge, including:
  - Inclusion of a bicycle and pedestrian path
  - Box girder and cable stay bridge types
- Montlake lid area, including:
  - Better connections
  - Quality open space
  - Sustainability
- Transit and non-motorized connections, including:
  - Bicycle and pedestrian connections to existing and planned city networks
  - Multimodal connections across the Montlake Cut
  - Implementation and next steps for connections

The design vision and goals for each of these areas, concepts explored, and design recommendations are further explained throughout this report.

Final Concept Design: Land bridge pedestrian and bicycle route over SR 520.

Final Concept Design: Landscape elements, grading, and landforms that respond to the historic context of the neighborhood provide both visual and physical buffers of the SR 520 roadway along East Lake Washington Boulevard.

Final design and beyond

WSDOT and city staff have continued to work in partnership on the remaining project elements, resulting in the Final Concept Design recommendations illustrated in this report. The Final Concept Design recommendations and updated project cost estimates will be presented to the Seattle City Council in early 2015 to inform their guidance and potential endorsement. The Seattle City Council may choose to formalize this guidance in a resolution.

In early 2015, WSDOT will present the results of this process, revised design plans, and updated cost estimates for the Final Concept Design to the State Legislature for funding consideration. When additional project funding is obtained, WSDOT will work with the city and other partners to finalize design, prepare for construction, and complete project delivery.

How has public input influenced the SR 520 corridor design in Seattle?

Public engagement and feedback have been an ongoing priority over the life of the SR 520 project and a key factor considered in design decisions. As described in Appendix C, many regulatory and legislative processes led to the selection of the current Preferred Alternative, and each step included public involvement and commenting opportunities to inform decision-making. The public has also played an important role in developing the Final Concept Design for project elements in Seattle.

Community members had the opportunity to learn more and comment on the design during the Summer and Fall of 2014.

The design preferences captured during the 2012 SCDP were published in a final design report. An appendix to the report summarized public comment received during the process.

To view these documents or for more information on the SCDP, see:

http://www.wsdot.wa.gov/Projects/SR520Bridge/I5ToMedina/scdp.htm

What was the Seattle Community Design Process?

Following federal approval of the Preferred Alternative in 2011, WSDOT launched the Seattle Community Design Process (SCDP), a robust and collaborative effort with the city of Seattle, design professionals, and the broader public to refine the corridor vision and conceptual design for the unfunded portions of the SR 520 project in Seattle. WSDOT convened the SCDP in 2011 to meet its commitment to work collaboratively with the city of Seattle and Seattle neighborhood stakeholders to refine the SR 520 corridor between I-5 and the West Approach Bridge. This commitment emerged from the 2010 multi-agency workgroup process (ESSB 6392) and the 2011 Seattle/SR 520 project Memorandum of Understanding.

The SCDP was an iterative process that:

- Informed the public about the SR 520 corridor in Seattle.
- Listened to community and stakeholder feedback regarding the project design.
- Explored design refinements and collected additional public feedback.
- Integrated best practices for urban and sustainable design into the project based on feedback received.
- Continued to collect input from agency partners and community stakeholders as the process moved forward.

What were the results of the process?

The SCDP included seven public workshops and generated thousands of public comments. Through this effort, WSDOT and the city of Seattle:

- Identified many well-supported design preferences that were endorsed by Seattle City Council.
- Identified areas requiring further design work before a Final Concept Design could be confirmed.

The city of Seattle formalized their guidance in Resolution 31427 in 2013, and WSDOT incorporated endorsed design elements in the SR 520 Preliminary Concept Design. Areas requiring further design exploration to reach a recommendation – the Portage Bay Bridge, the Montlake lid area, and non-motorized connectivity – were the focus of additional design work described in this report.

What did we hear from the public during the SCDP that informed the design recommendations in this report?

WSDOT heard several key themes from the public during the SCDP, which served as a foundation for additional design work in 2014. The design team began their work by reviewing the SCDP "Public Comment Summary" to ensure that recommendations reflected community preferences heard to date.

Common themes of public feedback during SCDP by area:

Portage Bay Bridge

- Continue to analyze and refine the box girder and cable stay bridge concepts (no clear public consensus for either type).
- Explore ways to integrate the bridge structure with the surrounding neighborhoods.
- Continue exploring the overall footprint, visual aesthetics above and below the bridge deck, and costs.
- Include a 14-foot-wide regional shared-use path.

Montlake area

- Explore ways to improve bicycle, pedestrian, and transit connections on the east and west sides of Montlake Boulevard East.
- Prioritize safe and efficient bicycle and pedestrian connections to other networks and transit areas.
- Buffer neighbors from both visual and noise effects of SR 520 traffic.
- Integrate with the Washington Park Arboretum by increasing the planted buffer between SR 520 and East Lake Washington Boulevard homes.
- Consider community concerns about increased traffic congestion and the need for traffic calming.

Montlake lid

- Re-examine the overall lid design and configuration to provide improved bicycle and pedestrian connectivity in key areas and in all directions.
- Further develop the western half of the lid as a mobility hub supporting safe connections to transit, bicycle, and pedestrian facilities.
- Provide and enhance space for active uses on the western end, and create usable green space that relates to the Arboretum further east.
- East of 24th Avenue East, explore ways to enhance north/south connectivity for pedestrians, bicyclists, and transit users.

2014 Public engagement by the numbers

350 ***Approximately 350 people attended the September open house (a project record)!***

150 ***More than 150 individual written comment cards were received at the open house.***

25 ***Project staff held more than 25 community organization and stakeholder briefings.***

Non-motorized connectivity

- Create quality non-motorized connections for users of all ages and abilities.
- Create safe, direct, continuous, and convenient access and connections with clear wayfinding.
- New trails should seamlessly connect to existing trails, transit facilities, neighborhoods, and other activity centers.
- Extend the regional shared-use path across Portage Bay Bridge, with good connections to neighborhoods and activity centers.
- Implement separated bicycle and pedestrian facilities wherever possible.
- Improve the experience and safety of connections under bridge structures.

How did work in 2014 build from the SCDP?

While the SCDP was an iterative public process, the 2014 design work was focused on decision-making related to remaining conceptual design issues. Therefore, public feedback was received primarily in existing forums at Seattle City Council and Seattle Design Commission briefings. WSDOT and the city of Seattle also briefed community organizations throughout the process and hosted an open house in the Montlake community to present the refined design concepts and hear public feedback. A summary of public feedback received at the September 2014 open house is provided in Appendix D. A summary of letters from community organizations providing feedback on the 2014 design work is included in Appendix H.

Stakeholders engaged in the 2014 SR 520 West Side Design Refinements process

Jurisdictions/Agencies

- King County
- NOAA – Northwest Fisheries Science Center
- Seattle Mayor's Office
- Seattle City Council
- Sound Transit
- University of Washington
- 43rd, 46th, and 48th District State Legislators

Community Stakeholders

- Arboretum and Botanical Garden Committee
- Arboretum Foundation
- Cascade Bicycle Club Board
- Local community councils
- Eastside Transportation Partnership
- Friends of Olmsted Parks
- Lake Washington Boulevard neighbors
- Microsoft
- Montlake area businesses
- National Historic Preservation Act Section 106 Concurring Parties
- Canal Reserve neighbors
- Queen City Yacht Club
- Seattle Bicycle Advisory Board
- Seattle Design Commission
- Seattle Greenways
- Seattle Pedestrian Advisory Board
- Seattle Yacht Club

See Appendix H to view a summary of letters received from community organizations.

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03 SR 520 WEST SIDE FINAL CONCEPT DESIGN

"Expanding and enhancing active transportation opportunities is a highly cost-effective approach to meeting the goals of Seattle's Climate Action Plan and protecting Seattle's unique natural environment."

Seattle Bicycle Master Plan, Seattle Department of Transportation

April 2014

City of Seattle

Washington State Department of Transportation

DESIGN RECOMMENDATIONS OVERVIEW

"The SDC greatly appreciates WSDOT staff and their consultants for their focused design process, highly collaborative engagement, and extensive reviews with the SDC."

-Memorandum: Recommendations for the Portage Bay Bridge and Montlake Lid components of the SR 520 Replacement Project
Seattle Design Commission, September 17, 2014

Introduction

The recommendations embodied within the Final Concept Design are intended to resolve areas that were identified as needing further refinement at the end of the 2012 Seattle Community Design Process based on feedback from the Seattle Design Commission, Seattle City Council, and community stakeholders. The 2014 design refinements are focused on specific geographic and functional subareas within the overall project area: the network of non-motorized and transit connectivity, the Portage Bay Bridge, and the Montlake lid area, each of which will be discussed in more detail in further sections of this chapter.

Working with the Seattle Design Commission

Over the past several years, the Seattle Design Commission (SDC) has been involved in the SR 520 Program through their participation in several design processes, including Floating Bridge and Landings Request For Proposals (RFP) development, the Seattle Community Design Process (SCDP), and the final design of the West Approach Bridge North (WABN).

In 2014, WSDOT and the city of Seattle partnered to collaborate with the SDC on the planning and design of the west side elements that were identified in the City Council's Resolution 31427 as needing further conceptual design work (see Appendix I). WSDOT and city staff provided three briefings to the full SDC and held five additional workshops with an SDC subcommittee. A team of urban planning, urban design, landscape architecture, and bridge architecture design consultants jointly hired by WSDOT and the city of Seattle shared explorations of design options for both the Montlake lid and the Portage Bay Bridge. Public comment opportunities were provided at the full SDC briefings.

Final Concept Design complete

WSDOT has completed Conceptual Design of the west side project elements and is ready to move forward toward funding and Final Design upon Seattle City Council's endorsement of the Final Concept Design.

2012
Seattle Community Design Process

2014
Final Concept Design

WSDOT staff explains project materials before a Seattle Design Commission meeting.

The project design team and the Seattle Design Commission engage in dialogue about design options for the Montlake lid.

Washington State Department of Transportation City of Seattle

Nature meets City: A century of planning Seattle's green network connections

The SR 520 program vision for the west side is guided by more than 100 years of open space planning for Seattle's open space network.

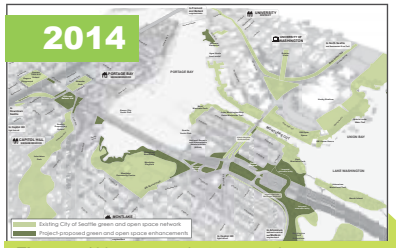
Overall vision

The new SR 520 project corridor is a critical regional highway facility that will support many modes of travel. WSDOT has the opportunity to build a more vibrant transportation facility through Seattle that could:

- Build upon Seattle's vision set forth 100 years ago to become a premier city by creating infrastructure that embraces our unique natural setting and promotes a vibrant urban environment.
- Yield affordable solutions and sustainability practices that support regional and local connectivity as well as ecology with a special focus on shoreline habitat and the use of low-carbon materials.
- Provide a memorable experience for all users, including motorists, pedestrians, bicyclists, transit users, recreationists and residents of adjacent neighborhoods.

Olmsted Parks, Boulevards and Playgrounds Plan *Seattle Board of Park Commissioners*

Bands of Green Plan
Seattle Parks Foundation



The next 100 years: *project-proposed green network and open space enhancements*

SR 520 overall vision

The SR 520 west side project vision is built upon an understanding of the project area's unique urban design legacy as a component of the historic Olmsted framework of interconnected Seattle parks and parkways, established more than 100 years ago. The vision also looks forward to the next 100 years by establishing sustainability goals for the design and operation of the corridor.

The natural blue-green tapestry formed by Lake Washington and the Washington Park Arboretum transitions into urban fabric via a network of boulevards, parks and open spaces as Nature meets City at the Montlake and Roanoke neighborhoods. Within this rich and varied context of neighborhoods and natural features, the SR 520 project has the potential to act as a catalyst for reconnecting natural and urban systems.

The 2014 work was guided by this overall vision of "Nature meets City," which was developed during the 2012 Seattle Community Design Process. WSDOT's vision for the SR 520 corridor is to become a sequence of gateways for the city of Seattle by building upon the early Seattle vision of connecting Seattle's green spaces, boulevards and waterways.

Urban design approach: The Olmsted legacy

The urban design approach for the west side of the SR 520 corridor is rooted in the legacy of the 1909 *Seattle Parks and Boulevards Plan* developed by the Olmsted brothers, which anticipates the need for sustainable infrastructure projects that can reconnect previously interrupted community and ecological connections. (See the "Olmsted Legacy and Section 106 Commitments" section of Appendix A for more information, pp. 100-103.)

The Olmsted brothers were hired by the city of Seattle in 1903 to develop a comprehensive plan for parks and for the 1909 Alaska-Yukon-Pacific Exposition. Although the initial goal of the plan was to locate parks and playgrounds equitably across the city, the final product was organized by a 20-mile landscaped boulevard linking both existing and future parks and greenbelts. Several features of the SR 520 project area constitute key pieces of this "parks and parkways" network, including East Lake Washington Boulevard, Montlake Boulevard East, and the Washington Park Arboretum.

The 2006 Seattle Parks Foundation's *Bands of Green* plan provided an update to the Olmsted concept of connecting Seattle's "emerald necklace" of green space by identifying opportunities to eliminate gaps in the network. The SR 520 project seeks to continue this legacy by reestablishing pedestrian, bicycle and ecological connections that strengthen the overall green network.

Sustainability practices and goals

WSDOT intends to implement the SR 520 Program in a manner that yields practical solutions and fosters sustainability practices that support regional and local connectivity, ecology and the use of low-carbon materials. Further, the design of the corridor will balance aesthetics, functionality, proportion and sense of speed along the SR 520 facility to provide a memorable experience for all users.

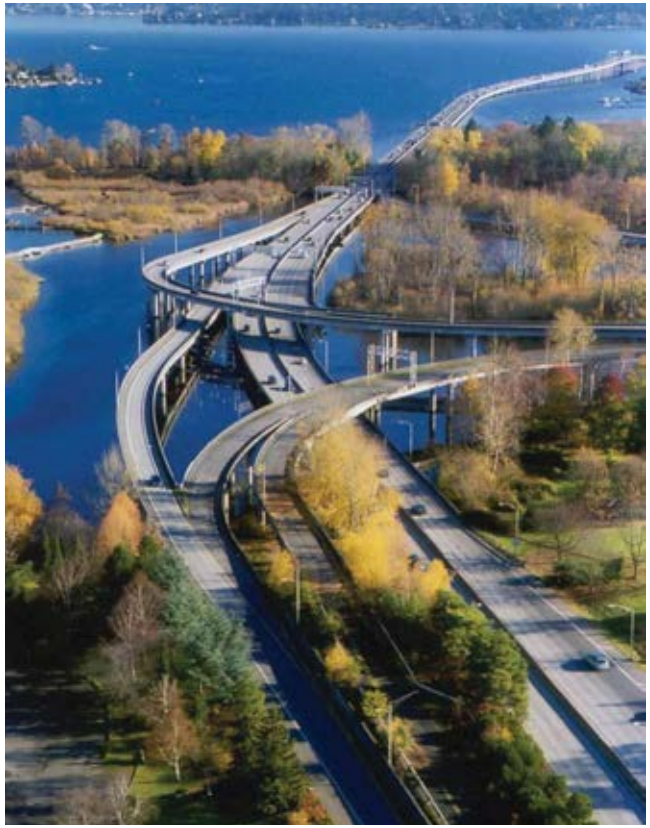
Design of the SR 520 project in the city of Seattle will meet and augment program sustainability goals by:

- Protecting and enhancing green and open spaces and aquatic habitats.
- Lessening construction impacts including duration, traffic disruption, and hauling.
- Reducing material volumes and energy use from the Preliminary Concept Design.
- Addressing life-cycle costs by reducing maintenance and operations through design and utilizing durable materials.
- Increasing life span and usability of structures.
- Employing practical design.

Reduction of materials is achieved through:

- Innovative technologies such as seismic isolation bearings.
- Simplification and reduction of substructure elements on bridges, including increasing pier spacing, reducing the depth of the bridge deck, and reducing the number of piers.
- Maximizing efficiency of open spaces.

These sustainability goals can lead to a reduction in concrete that has the potential to reduce carbon dioxide (CO_2) emissions.



The project's sustainability goals seek to protect and enhance the unique natural context of the SR 520 corridor.

"The blue-green qualities of the corridor can be more vibrantly revealed and enhanced by the SR 520 project, benefiting those who live nearby and those who pass through."

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

Continued compliance with programmatic agreements

The Final Concept Design is guided by the framework established in the SR 520, I-5 to Medina Project EIS while improving upon the project design performance measures of utility, sustainability and expression. The proposed design refinements will be evaluated for consistency with the Section 106 programmatic agreement, in which WSDOT made specific commitments to help protect historic communities and cultural resources. No new significant environmental impacts are anticipated as a result of the Final Concept Design refinements.

Final Concept Design

This report illustrates the 2014 design refinements that were made in the areas of non-motorized and transit connectivity, the Portage Bay Bridge, and the Montlake lid. These refinements continue to be guided by the overall vision of the project as well as its goals for urban design and sustainability.

Working from this foundation, the project team has continued to develop a more specific vision and set of goals for each of the three subareas that guided the development of the design in 2014. The following sections of this chapter will illustrate the refinements that have resulted in the Final Concept Design for the project elements that make up the "Rest of the West."

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NON-MOTORIZED CONNECTIVITY

Vision and goals

The *Washington State Bicycle Facilities and Pedestrian Walkways Plan* (2008) outlines strategies for state facilities to improve connections, increase coordination, reduce traffic congestion, and ultimately to double bicycling and walking rates while reducing injuries and deaths.

Non-motorized connectivity goals for the SR 520 project in Seattle emphasize the development of a regional facility that provides a safe, efficient and interesting route for travel by foot and bicycle as well as intuitive, well-maintained and multiple options for transitions to and from the city of Seattle bicycle and pedestrian networks.

During 2014, the WSDOT design team worked collaboratively with the city of Seattle to refine the vision and goals for non-motorized facilities based on ongoing public input, Seattle Design Commission recommendations, and design team discussions. The team focused specifically on areas for which concepts had not been developed or resolved during the 2012 Seattle Community Design Process (SCDP). The design team worked from the design goals that were established in 2012 and that continue to guide the development of the design team's recommendations. These goals include:

Access and mobility

- Mobility between and through neighborhoods with various travel modes and convenient routes.
- Access to all levels, abilities and needs through best practices and compliance with Americans with Disability Act (ADA) requirements.
- Capacity for current and future non-motorized traffic volumes.

Health and safety

- Safe and interesting cycling and walking routes to attract diverse users with varying skill and confidence levels for recreation and health.
- Promotion of traffic calming and reduction of potential conflicts among cyclists, pedestrians and vehicles using path separation, widening, and safe and distinctive surfacing, as well raised crosswalks, effective signalization and/or signage.
- Encourage commute-trip reduction, reduced congestion and reduction of greenhouse gas emissions by providing connections to transit as well as improved bicycle and pedestrian facilities.

Character and clarity

- Building connections to and through green (parks and urban forest) and blue (waterways) open space networks that can support multiple uses.
- Using paths to activate open spaces and lids as well as to create easy connections to activity centers.
- Developing clear and intuitive wayfinding to promote cycling and walking as everyday means of travel.

Major recommendations for non-motorized routes, facility types and logic that were developed through the cooperative efforts of WSDOT and the city of Seattle, endorsed by the Seattle Design Commission and supported by stakeholders are summarized in the "SR 520 and City of Seattle Non-motorized Connectivity Network" exhibit (see pp. 6-7 and 25). Specific recommendations and associated benefits, risks and requirements are detailed in the *Non-motorized Connectivity Technical White Paper* (see Appendix B).

A bicycle path adjacent to a sidewalk in Boston.

The Midtown Greenway shared-use path in Minneapolis, MN provides separated facilities for cyclists and pedestrians.

Regional shared-use paths like the Burke-Gilman Trail are used by multiple modes.

Seattle Bicycle Master Plan 2014: City goals for the project area

In 2014, the city of Seattle and the Seattle Department of Transportation (SDOT) published the updated Seattle Bicycle Master Plan (BMP). The BMP served as an important baseline for the SR 520 team in developing recommendations and additional design considerations for non-motorized facilities for the SR 520 project.

BMP catalyst projects

The BMP identifies several key city of Seattle routes within the SR 520 project corridor as well as important facilities that transition to and through the area (see East Sector map to the right). These identified routes include two catalyst projects - the SR 520 non-motorized connection across Portage Bay Bridge, and an improved crossing of Montlake Bridge. Catalyst projects are defined as "projects located at significant choke points in the network [that] are critical to providing network connectivity for people of all ages and abilities... [which]...reduce critical barriers to bicycling by closing network gaps and increase safety by building all ages and abilities friendly bicycle facilities to the maximum feasible extent." (BMP, pp. 40, 53)

Bicycle facility types recommended by the BMP

The BMP identifies additional existing and recommended **separated facilities** and **shared-street facilities.** Separated facilities include cycle tracks and separated shared-use paths, like the Burke-Gilman Trail. Shared facilities include shared streets, or "sharrows," as well as facilities with minor separation, such as painted bike lanes without buffers.

The BMP identifies several new city of Seattle designated **neighborhood greenways** within the SR 520 project area. Neighborhood greenways are shared facilities defined by the BMP as routes that use "...signs, pavement markings, and traffic calming measures to discourage through trips by motor vehicles, while accommodating local access. Intersection crossing treatments (particularly at arterial crossings) are used to create safer, more comfortable, and convenient bicycle and pedestrian-optimized streets." (BMP, p. 56) There are several streets identified as greenways that are within the SR 520 project area and adjacent street networks.

A cycle track in Seattle's Capitol Hill neighborhood.

Finally, the 2014 BMP recommends **cycle track** facilities for some streets within the SR 520 project area. Cycle tracks are defined as an "...on-street bicycle facility... also known as protected bicycle lanes, [that] offer the most protection and separation from adjacent motor vehicle traffic. It is important to consider all users when designing a cycle track. Considerations include pedestrians crossing the cycle track from a parked car, access to and from transit or at the intersection, universal design/American with Disabilities Act (ADA) guidelines, commercial vehicle loading zones, trash pick-up, and motor vehicles crossing the cycle track at driveways and intersections. Cycle tracks may be one-way or two-way, and may be at street level, or raised to the sidewalk or an intermediate level." (BMP, p. 59) In the BMP, the implementation of cycle tracks is intended to be a multi-year process, with feasibility studies to determine whether a cycle track can be constructed. Identified cycle tracks in or near the SR 520 project area include: Eastlake Avenue East, Harvard Avenue East north of East Shelby, 10th Avenue East south of East Roanoke Street, and Montlake Boulevard East between the Montlake Bridge and East Roanoke Street.

Coordination with the Seattle Department of Transportation has resulted in a series of recommendations for WSDOT non-motorized facilities as well as potential updates to the city of Seattle's Bicycle Master Plan.

For more details, see the 2014 Seattle Bicycle Master Plan.

East sector map from the 2014 Seattle Bicycle Master Plan.

Anders Wilse Guide Map to Bicycle Paths North of Yesler Avenue Seattle WA 1900. (Source: Seattle Department of Transportation)

Summary of major recommendations

A work group consisting of WSDOT staff, urban design consultants, and city of Seattle staff evaluated the current design, weighed public input from the SCDP in 2012, incorporated Seattle Design Commission recommendations and referenced the plans and aspirations laid out in the *Seattle Bicycle Master Plan* update. The analysis of this work group is summarized in the *Non-motorized Connectivity Technical White Paper* (see Appendix B). A summary of key recommendations include:

- Providing more, better and safer options for bicyclists and pedestrians moving to and from the Portage Bay Bridge.
- Improving pedestrian safety by shortening crosswalks and improving sight distances.
- Creating an intuitive and attractive connection via a land bridge across SR 520 that connects the Arboretum, the regional shared-use path and East Montlake Park.

Ongoing non-motorized design discussion for Montlake Boulevard East

WSDOT and the city of Seattle are also actively pursuing design explorations to address the need for improved multimodal mobility and access along Montlake Boulevard East and across the Montlake Cut.

Three alternatives for additional capacity across the Montlake Cut have been identified by the work group and will require additional evaluation by the city of Seattle to determine the feasibility of the design, operation and maintenance of the respective alternatives (see “Non-motorized connectivity network” exhibit on pp. 9-10). Further discussion and approval by the Seattle City Council is required for these alternatives, which include:

- **A. WSDOT second bascule bridge** for general-purpose traffic, transit, pedestrians and bicycles. This alternative is included in the 2011 SR 520 Preferred Alternative. It would be located directly east of and adjacent to the existing Montlake Bridge and would provide an 18-foot-wide shared-use path on the east side of the new structure.

  OR

- **B. Separate bicycle and pedestrian-only bascule bridge adjacent to the existing** Montlake Bridge and additional transit improvements. The size and configuration of this option is still to be determined.

  OR

- **C. Separate bicycle and pedestrian-only bascule bridge east** of the existing Montlake Bridge with proposed connections to the regional shared-use path through East Montlake Park and additional transit improvements. The size and configuration of this option is still to be determined.

Pending approval by the Seattle City Council of a Montlake Cut crossing alternative, the work group explored several potential conceptual non-motorized improvements along Montlake Boulevard East to the Montlake Cut, including:

1. Widening 8-foot-wide sidewalks to 10 feet wide on both sides of the street.
2. Widening the west side to 10 feet and the east side of the street to a 14-foot-wide shared-use path to accommodate cyclists and pedestrians.
3. Widening the west side to 10 feet and the east side of the street to a 14-foot-wide cycle track and an 8-foot-wide sidewalk to separate cyclists and pedestrians.

Analysis and design development of these options for improved bicycle and pedestrian access weighed several key criteria, including:

- Bridge crossing alternatives identified for the Montlake Cut.
- Trade-offs between potential environmental and neighborhood impacts and improved pedestrian and bicycle safety.
- Constraints of a limited right-of-way, or opportunities outside of the right-of-way.
- Type of facilities identified in the 2014 *Seattle Bicycle Master Plan.*
- Potential impact of the various options on trees, adjacent neighbors and historic integrity of an Olmsted boulevard.

Next steps

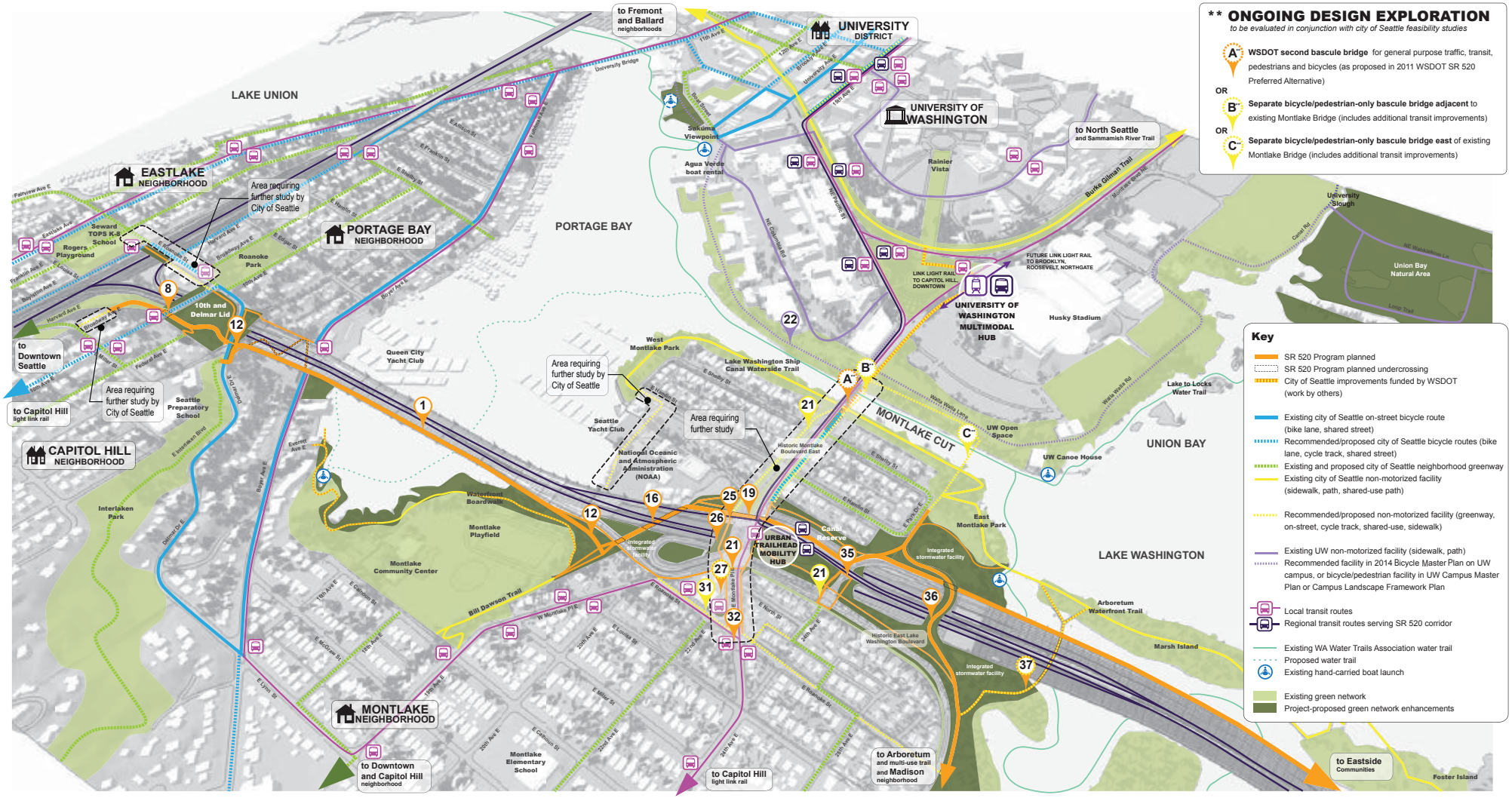
The recommendations developed by the design team and described in detail in the *Non-motorized Connectivity Technical White Paper* (see Appendix B) will serve as the basis for implementation of bicycle and pedestrian design for the SR 520 west side project and transitions to and from the Seattle non-motorized network. In anticipation of legislative funding, the SR 520 program and the city of Seattle will continue to coordinate efforts to ensure relevant, quality non-motorized facility planning and design implementation where design alternatives are still being considered.

This coordination will include the ongoing refinement of proposed improvements for connections to and along Montlake Boulevard East, particularly on the west side at the interchange, where stakeholders have provided input on additional alternatives. If existing physical constraints change in the future, WSDOT and city of Seattle will pursue other opportunities to further improve conditions for pedestrians and cyclists at this location.

Decisions regarding alternatives for crossing the Montlake Cut will be addressed by the Seattle City Council, which will provide information for future designs to move forward.

Over the next year, WSDOT will capture design recommendations developed by the work group, as well as direction provided by city of Seattle resolutions, in conceptual-level engineering plans to ensure that when funding becomes available, the agency will be ready to move forward with Final Design and project construction.

SR 520 and city of Seattle non-motorized connectivity network



A synthesis of existing and planned non-motorized routes and connections in and around the SR 520 project area. For more detail on specific design recommendations, see pp. 6-7 and Appendix B.

City of Seattle | Washington State Department of Transportation

PORTAGE BAY BRIDGE

Introduction

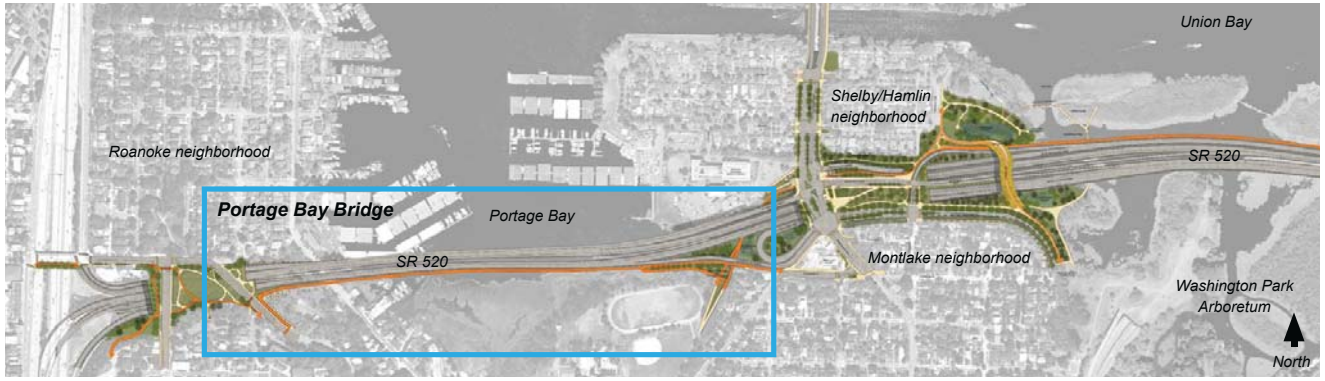
The Portage Bay basin is a picturesque area enclosed by the ridge at Roanoke, hillside residences, the wetlands and the park area of Montlake Playfield and the University of Washington, which lies to the north along Portage Bay. The basin is bisected by the Portage Bay Bridge, which links the Montlake, 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 character of the surrounding area and responds to the SR 520 corridor and regional connections.

Portage Bay Bridge vision and goals

The design team recognizes that the Portage Bay Bridge is both a distinctive and context-sensitive element within the family of SR 520 bridges. It serves as a connecting thread, tying together the tree-covered Roanoke ridge to the west and the heart of residential, research and multimodal transportation at Montlake to the east. With the addition of a shared-use path, the Portage Bay Bridge helps to complete regional connectivity for all modes of users from SR 202 in Redmond to I-5 in Seattle.

Design framework

As a result of public and city feedback received during the 2012 Seattle Community Design Process (SCDP), two distinct bridge types were identified as potential solutions for the Portage Bay Bridge replacement: box girder and cable stay. In 2014, the design team, with the assistance of a nationally-award-winning bridge architect, worked with a Seattle Design Commission (SDC) subcommittee to establish a design framework for exploring the opportunities and challenges of the box girder and cable stay bridge types. Ultimately, the Final Concept Design recommends a box girder bridge. This section of the report explains how the team evaluated the two options and how the Final Concept Design recommendation of a box girder was chosen.



Portage Bay Bridge study area

A detailed summary of the complete framework criteria, design explorations and evaluation are included in the "SR 520 Portage Bay Bridge area evaluation matrix" (see p. 29). The team considered architectural quality, community context/public input, constructability and construction duration, connectivity, site conditions/environmental impacts, and the WSDOT mandate of "Practical Solutions." The SDC subcommittee and the design team focused in particular on architectural qualities, breaking these criteria down into several sub-criteria, including goals that the Portage Bay Bridge:

- Appear light and graceful and fit within the scale and character of Portage Bay.
- Enhance the blue-green network by acting as a connecting thread among the city's natural, urban and historic elements.
- Act as one of a series of gateways within the SR 520 corridor experience.
- Have integral architectural elements with aesthetic interest and structural logic.
- Follow the horizon line in a logical and compelling fashion.
- Accommodate differing user speeds, skills and viewpoints.
- Improve views and access from the water and surrounding shorelines.
- Allow natural light to reach the water and land by separating the eastbound and westbound lanes.
- Enhance recreational activities on water by raising the bridge profile and allowing unrestricted watercraft passage.

What we explored

Through a series of design studies, the team further refined both the box girder and cable stay in order to address the concerns of stakeholders and to respond to the feedback from the SDC. The design explorations represented in the following pages are conceptual and do not include elements such as bridge lighting, signage and utility cabinets. These elements will be developed as Final Design moves forward.

"Consider the bridge within the context of the larger SR 520 network, particularly its role as a gateway experience both entering and leaving Seattle."

- Memorandum: *Recommendations for the Portage Bay Bridge and Montlake Lid components of the SR 520 Replacement Project*
Seattle Design Commission, September 17, 2014

How does the Portage Bay Bridge fit within the Project Vision?

Through WSDOT's work with the Seattle Design Commission, the design team developed a Project Vision that provides a design framework for design refinements for the Portage Bay Bridge. The goals include:

- Support many modes of travel.
- Build upon Seattle's vision set forth 100 years ago to become a premier city by creating infrastructure that embraces our unique natural setting and promotes a vibrant urban environment.
- Yield affordable solutions and sustainability practices that support regional and local connectivity as well as ecology with a special focus on shoreline habitat and the use of low-carbon materials.
- Provide a memorable experience for all users, including motorists, pedestrians, bicyclists, transit users, recreationists and residents of adjacent neighborhoods.

A diagrammatic illustration of design refinement explorations in the Portage Bay Bridge area.

Site photos

From Delmar Drive East looking southeast.

From Boyer Avenue East looking northeast.

From Northeast Pacific Street looking south.

From Montlake Playfield looking northwest.

At the Bill Dawson Trail undercrossing, looking south.

At NOAA looking west.

From Montlake Boulevard East looking west.

From West Montlake Park looking southwest.

Evaluation of design explorations

The design team developed a detailed evaluation matrix (see “SR 520 Portage Bay Bridge area evaluation matrix,” p. 29) to test the design vision and design framework against the physical design of the bridge. Working with the SDC subcommittee, the design team identified several key questions through their explorations:

- Is the bridge intended to be in the foreground or background, e.g. is it iconic or contextual?
- Does the bridge become a single moment or gateway, or is it part of a series of gateways along the entirety of the SR 520 corridor?
- How does the bridge link the future lids at Montlake and 10th and Delmar?
- How might lighting enhance the bridge at night without negatively impacting environmental conditions or adjacent neighborhood context?
- How is the bridge experienced from the perspective of all users: boaters, drivers, neighbors, cyclists and pedestrians - and how might this affect scale, materials and form?

The team addressed concerns about in-water impacts (pier size and number), bridge width, bridge deck thickness, views above and below the bridge, inclusion of a shared-use path and connections to the Montlake and 10th and Delmar areas, and overall constructability, contextuality and cost. As a result of these efforts, the team was able to update the design from the Final Environmental Impact Statement (FEIS) Preferred Alternative for both bridge types and:

- Better understand the visual, environmental, neighborhood and regional contexts for both bridge types.
- Reconfigure the bridge profile to create a more accessible, 2.6 percent constant slope and improve views under the east end of the bridge.
- Maintain the same bridge width for both bridge types.
- Minimize in-water impacts for both bridge types.
- Analyze opportunities for lighting for wayfinding and user guidance.
- Provide a gap approximately 19 feet wide between eastbound and westbound lanes, allowing light to reach water and land below and facilitating constructability.
- Create a more consistent bridge type across the entire length of the bridge.

SR 520 Portage Bay Bridge area evaluation matrix

	Criteria	Feedback*		Design Explorations**		Evaluation**	
		Seattle Design Commission	Expert Review Panel	Cable Stay	Box Girder	Cable Stay	Box Girder
Expression	**Architectural quality** • Appears light and graceful • Acts as a connecting thread among the city's natural, urban and historic elements • Fits within scale and character of Portage Bay • Serves as one of a series of gateways • Creates integrated architectural elements-aesthetic interest and structural logic	• Is bridge **"foreground" or "background"?** • Consider Portage Bay Bridge as part of a sequence of gateways, a "moment" or "passage" • Fit in **Portage Bay landscape/** basin • "Sleek and slender" bridge • **Link lids using bridge** • Refine quality and experience of understructure • Consider how lighting might work with bridge	• Can meet project aesthetic goals and objectives with either bridge type	• **Explore tower numbers and heights** (*2012 SCDP concept:* 2 towers, *initial 2014 exploration:* single higher tower centered on bridge, *advanced 2014 concept:* three towers) • Change angle of exterior cables • Create "fan" of thinner cables	• Remove arches from FEIS Preferred Alternative • Reduce thickness of columns • Refine form of columns • Explore above deck elements • Facet deck edge and recess pier caps	• Emphasizes **bridge structure as "moment"**, bay as background • Bridge towers rise in height to **follow horizon line** • Slimmer towers and angled, thinner cables improve "lightness" of structure • Bridge **deck is thinner** than box girder • Understructure reveals structure	• Emphasizes **bridge structure as "passage"**, bay as foreground • Bridge deck **follows horizon line** • Major and minor elements at piers establish rhythm and awareness of experience of bridge structure • Bridge **deck appears thinner** than FEIS Preferred Alternative box girder • Understructure hides structure
				• Separate eastbound and westbound structures with gap • Raise bridge profile on east end of bridge to allow for longer spans • Refine deck edge treatment and reduce depth of structure • Coordinate future design refinements for location and character of signage and lighting elements with bridge structures • Explore potential opportunities or effects of bridge lighting		• **More consistent bridge type and appearance** for greater length of bridge compared to FEIS Preferred Alternative or SCDP Preliminary Concept Design • **Gap between structures increases light** below bridge and sense of "lightness" • Sign structures may impact views to and on bridge • Lighting changes character and visibility of bridge at night	
	Community context/ public input • Minimizes bridge width and thickness • Preserves or improves views above and below bridge • Improves safety and access at shoreline	• Reduce visual clutter • **Protect or improve views** above and below bridge • **Minimize "flaring" of structure** at bridge ends	• Reduce pier numbers and increase pier spacing (longer spans)	• Reduce tower height • Reorient pylons in water • Address understructure	• Avoid "highway" look for box girder • Simplify and refine understructure	• Higher structure above deck than box girder but 3 towers shorter than 2012 SCDP concept	• Some minor and major elements above deck (lighting, structural rhythm)
				• **Reduce "flaring" at west portal** • Separate eastbound and westbound structures with gap • Reduce in-water structures number and size • Increase span widths		• **Bridge width reduced** at west end of bridge • Gap increases light below bridge deck and **visually reduces mass of structure** • **Better views created under bridge** from shoreline to water and surrounding bay • Shared-use path adds more width to bridge within the right of way • Both bridges require operational signage and lighting above the bridge deck	
Utility	**Constructability and construction duration** • Creates buildable design • Reduces construction time • Minimizes construction time and impacts • Maintains access during construction	• Shift west end of bridge north	• Shift west end of bridge north • Separate eastbound and westbound structures on box girder • **Raise bridge profile** at east end of bridge to 2.6% constant grade (Preferred Alternative = 4.5%, 0.9%)	• Cable stay design has gap; updated design to consistent gap of approximately 19 feet between eastbound and westbound structures • Harp (angled) cables to reduce tower heights	• Separate box girder eastbound and westbound structures with consistent gap of approximately 19 feet	• Requires temporary relocation of Dock 3 at Queen City Yacht Club but modified operations maintained	• Maintains Queen City Yacht Club Dock 3 operations during construction
						• Access for boats under bridge allowed at times during construction • **Easier constructability for both bridge types** • North shift reduces construction duration 1.5 to 2 years • Bridge profile with constant grade allows construction of **longer spans** and better drainage	
	Connectivity • Completes regional connectivity for all modes of users from SR 202 to I-5 • Accommodates differing user speeds, skills and viewpoints • Is safe, intuitive, comfortable, memorable	• **Provide a shared-use path** on Portage Bay Bridge regardless of bridge type	• Improve bridge grade	• **Locate shared-use path on south side** of bridge • Provide constant grade for all users • Create usable shared-use connections at both ends of bridge • Avoid additional structure at connections where feasible • **Coordinate future design refinements** of path connections and portals as part of bridge design		• Shared-use path meets connectivity criteria with either bridge type • **Constant grade safer and more accessible** for non-motorized users • Non-motorized connections at west and east bridge ends are ADA accessible and provide **separated or at-grade options** to and from city of Seattle network • Increased usability for watercraft under bridge at east end • Transit and HOV lanes	
Sustainability	**Site conditions/ environmental** • Addresses poor soils • Minimizes shading • Enhances shorelines	• Reduce environmental impacts	• Separate eastbound and westbound structures with gap in box girder from Preferred Alternative • Reduce number of in-water structures	• Gap between eastbound and westbound structures required with cable stay • Tower and pier spacing increased • Move west bridge towers off Roanoke	• Change single box girder structure to two box girder structures separated by gap • Increase pier spacing from FEIS Preferred Alternative	• Total in-water piers reduced **from 9 to 6** (total structures from 11 to 9) • Relocated towers avoid historic slide area	• Total in-water piers reduced **from 10 to 7** (total structures from 13 to 10)
				• Reduce number and size of in-water structures • Raise bridge profile on east end of bridge		• Reduced in-water structures **lessen environmental impacts** on aquatic habitat • Gap between structures allows light to reach water • Raised profile on east end of bridge allows more light on water and at shoreline • More opportunity for **connecting green spaces and access at shoreline**	
	Practical Solutions • Meets project budget • Achieves sustainability goals ▫ Reduces material volumes, energy use ▫ Minimizes maintenance and operations ▫ Increases bridge life span and usability	• Consider life-cycle costs	• Meet *Practical Design* requirements	• Reduce construction time (see *Constructability and construction duration*) • Use lower maintenance, more durable materials • Reduce materials (concrete)		• Higher cost per square foot **$530-650 SF** • 60% higher carbon footprint than box girder • Higher long-term maintenance costs • Uses 15% more concrete, 90% more steel than box girder (rebar, structural steel: edge beam, floor beams, stays and casing in foundation)	• Lower cost per square foot **$320-390 SF** • 60% lower carbon footprint than cable stay • Lower long-term maintenance costs • Uses 15% less concrete, 90% less steel than cable stay (rebar and steel casing in shafts)
						• **Minimum 75 year design life** for both bridge types • Both bridge types require regular biannual inspections	

** Includes feedback from the 2012 Seattle Community Design Process and the 2014 Seattle Design Commission and Constructability Expert Review Panel.*

***Design explorations build on and refine the Preferred Alternative documented in the 2011 FEIS, the 2012 Preliminary Concept Design, and respond to additional feedback from the 2014 Seattle Design Commission and Expert Review Panel processes.*

City of Seattle Washington State Department of Transportation

Box girder precedents studied

Box girder: *Sir Leo Hielscher Gateway Bridge, Brisbane, Queensland Australia. (Source: Wikimedia Commons)*

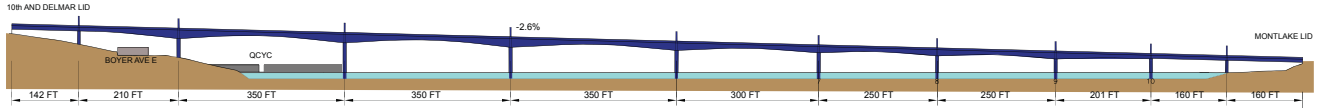
Box girder: *Folsom Dam Bridge, Folsom, CA. (Source: MacDonald Architects)*

Box girder bridge design explorations

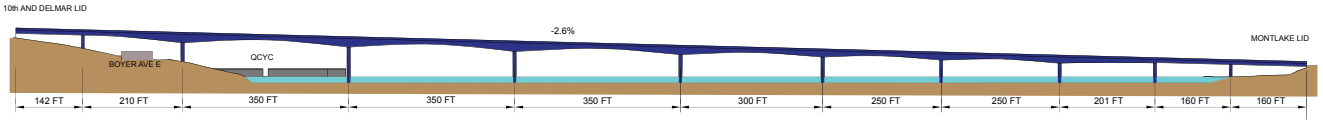
Through their work with the SDC subcommittee, the design team developed the "SR 520 Portage Bay Bridge area evaluation matrix" (see page 29) to test the feasibility of both bridge types. The key concern regarding the box girder bridge type was the number and size of piers in the water. The design team explored innovative approaches for reducing the total number of piers in the water and increasing span lengths in order to reduce in-water impacts while improving views to the water and surrounding parks and neighborhoods.

With the SDC subcommittee, team members also explored opportunities to improve the architectural character of the box girder by referencing the language of surrounding features and simplifying those forms to develop a sleek structure and a contemporary look from a variety of perspectives and for diverse users. These refinements also included design thinking about the location and character of lighting. Through these explorations, the design team proposed a series of light fixtures that correspond to the location of piers (major bridge elements) and other bridge structures (minor bridge elements) to create a hierarchy and rhythm as part of the experiential quality of passing over and under the bridge.

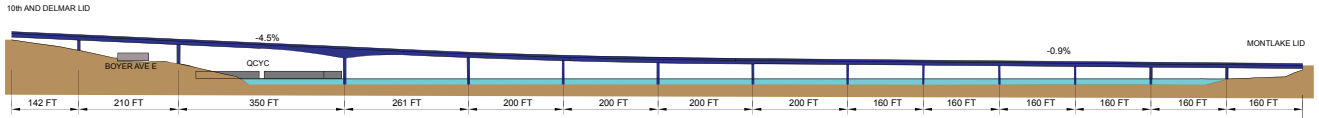
The design team further explored a more context-sensitive box girder bridge type, including reducing the number of in-water piers, articulating the architectural elements to create the appearance of a slimmer bridge, providing scaled above-deck elements to create a sense of rhythm and integrated structure, changing the bridge profile so that the box girder form could carry along the full length of the bridge, and separating east- and westbound lanes with a gap of approximately 19 feet.



Late 2014 design exploration with a constant slope profile of 2.6%, a gap of approximately 19 feet between eastbound and westbound lanes, and above-deck elements.



Early 2014 design exploration with a constant slope profile of 2.6% and a gap of approximately 19 feet between eastbound and westbound lanes.



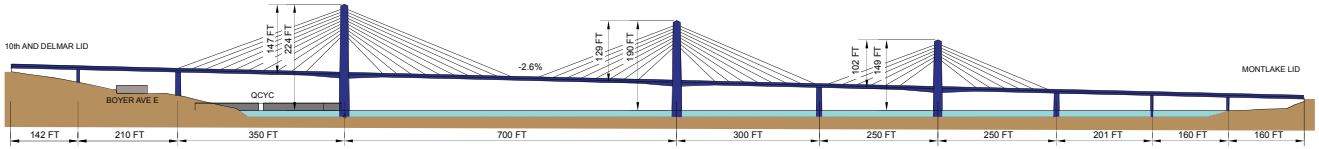
2012 design exploration with box girder at west half and prestressed girder at east half.

Pros

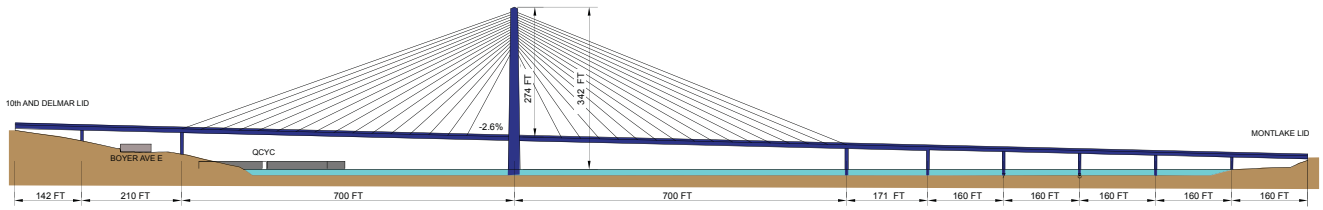
- Potential for quality and distinctive design with faceting of bridge piers, cap ends and major and minor elements.
- Provides a contextually-sensitive bridge.
- Emphasizes the experience of the Portage Bay natural area and surrounding neighborhoods.
- Improves views and experience under the bridge through the reduction of in-water piers and lengthened bridge spans.
- Allows light to reach land and water (via a gap approximately 19 feet wide between the eastbound and westbound structures) to enhance habitat, improve bridge appearance and facilitate constructability.
- Potentially reduces visual impacts with less in-water work.
- Represents less project cost per square foot than cable stay bridge.
- Reduces size of carbon footprint.

Cons

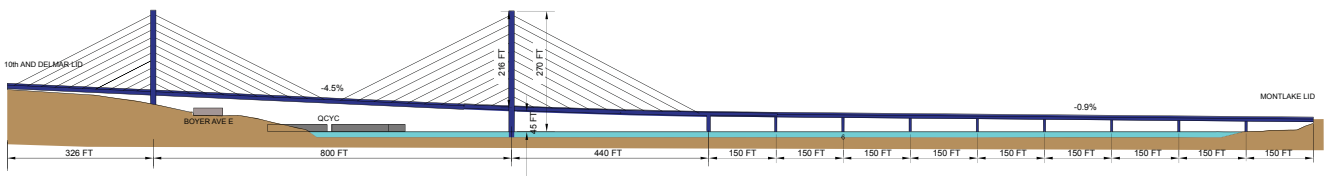
- Requires attention to bridge connections at Montlake and Roanoke areas.
- Has potential to retain a "highway" look.



Late 2014 design exploration with three lowered towers shifted east with a gap of approximately 19 feet between eastbound and westbound lanes.



Early 2014 design exploration with single taller tower shifted east and a gap of approximately 19 feet between eastbound and westbound lanes.



2012 design exploration with two towers at west end of bridge with a gap of approximately 19 feet between eastbound and westbound lanes.

Pros

- Provides a distinctive bridge at Portage Bay and in Seattle.
- Creates a modern design with lightness and transparency.
- Decreases below-deck structure with longer spans open to the bay below for boat access and visibility.
- Reduces tower heights and widths to improve contextuality of bridge.
- Potentially uses less material and requires less in-water work.
- Allows light to reach land and water (via a gap of approximately 19 feet between the eastbound and westbound structures) to enhance habitat, improve bridge appearance and facilitate constructability.

Cons

- Higher cost per square foot could present budget challenges.
- May have higher long-term maintenance costs.
- Uses more concrete and steel than box girder.
- Design may not be contextually appropriate in terms of scale or type.

Cable stay precedents studied

Cable stay: *Golden Ears Bridge with shared-use path, Vancouver, British Columbia.*

Cable stay: *21st Street Bridge, Tacoma WA. (Source: Wikimedia Commons)*

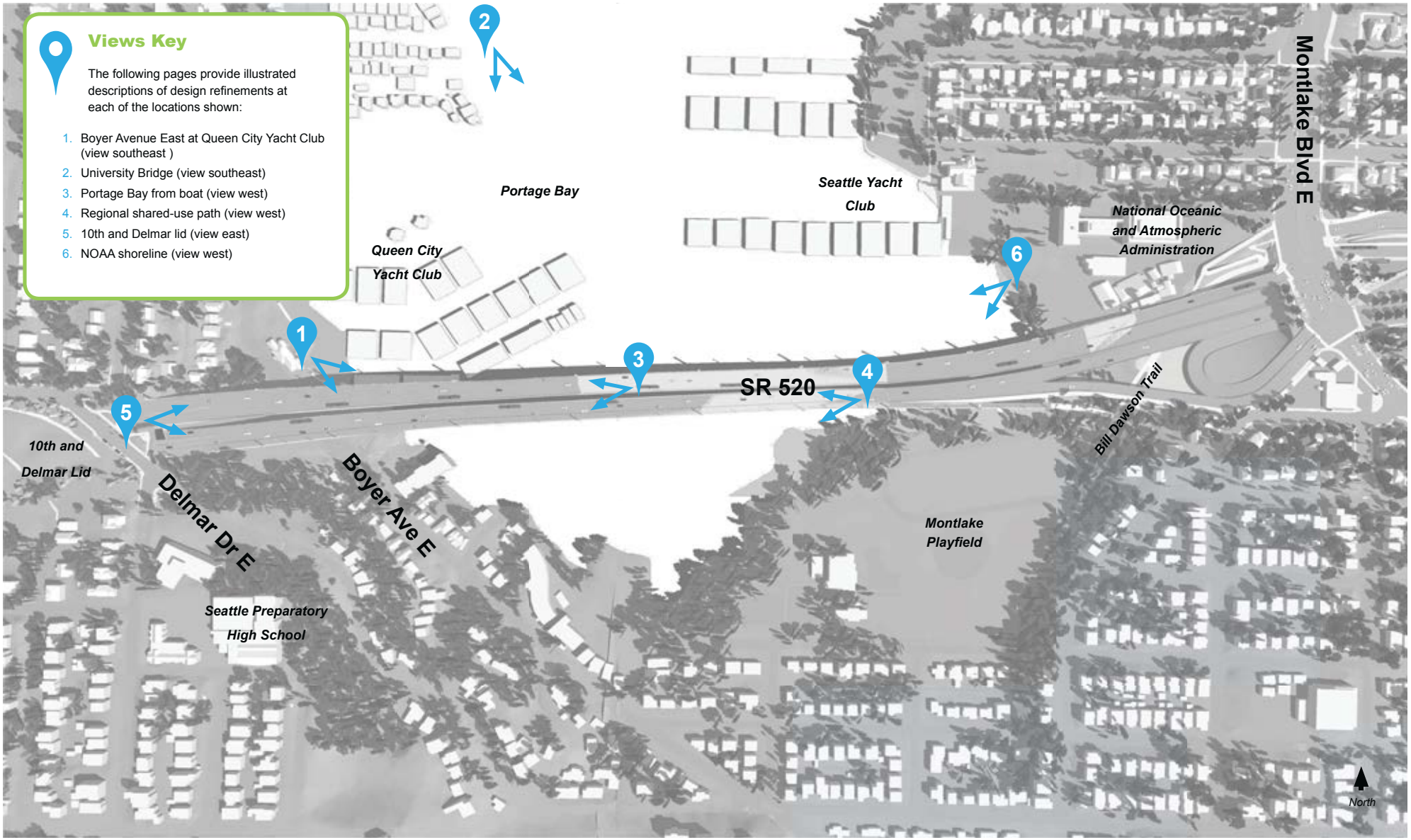
Cable stay bridge design explorations

The design team also pushed forward the exploration of the cable stay bridge type by looking at three distinct design approaches to a cable stay bridge: the FEIS Preferred Alternative with two 270-foot towers, a single 342-foot tower, and three 190-foot towers (tower height measured from the water).

The objective of these studies was to explore a cable stay bridge that was both distinctive and contextual. Concerns with the two-towered bridge explored in 2012 included the height of the towers and the proximity of the first tower to the adjacent Portage Bay and Roanoke neighborhoods.

The next design iterations explored both a single tower option and a three-tower option to address concerns about the close proximity of the towers to neighbors as well as to improve the consistency of the bridge type across the entire length of the bridge. The three-tower alternative allowed the design team to decrease tower height and move above-deck structures away from adjacent homes. However, it also required additional in-water structure compared to the single-tower bridge.

The design team further explored opportunities to develop a more context-sensitive cable stay bridge type, including varying the number, location and height of bridge towers.



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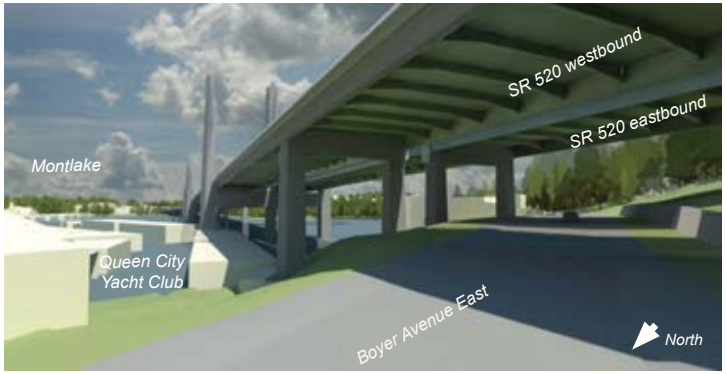
Existing conditions (Source: Google maps)



Cable stay: *Portage Bay Bridge at Boyer Avenue East by Queen City Yacht Club, view southeast.*

Final Concept Design

Box girder: *Portage Bay Bridge at Boyer Avenue East by Queen City Yacht Club looking southeast.*

VIEW 1:
Boyer Avenue East and Queen City Yacht Club

"Emphasize minimizing the appearance of the bridge deck and related infrastructure for recreational users and nearby residents."

- Memorandum: Recommendations for the Portage Bay Bridge and Montlake Lid components of the SR 520 Replacement Project
Seattle Design Commission, September 17, 2014

Background and context

The Portage Bay Bridge on the west side of Portage Bay rises to meet the ridge at Roanoke and is adjacent to the Queen City Yacht Club to the north, Seattle Preparatory High School to the south, and the North Capitol Hill, Portage Bay, Roanoke and Montlake neighborhoods. Views to and from the water and the bridge itself are important for surrounding neighbors and other users, as are the quality and safety of the spaces under the bridge at the abutment.

Design refinements

- Improve the visual appearance of the bridge understructure with use of box girders.
- Provide a gap of approximately 19 feet between the eastbound and westbound structures to allow light to reach land and water, enhancing habitat, improving the bridge appearance, and facilitating constructability.

Design intent

- Reduce visual clutter through the use of quality materials and graceful forms with the box girder structure.
- Employ Crime Prevention Through Environmental Design (CPTED) principles to ensure safety for all users on and under the bridge.

VIEW 2:

University Bridge

"The slope of the bridge should both enhance its contextual relationship to Portage Bay and consider the needs of cyclists and pedestrians. While we [SDC] recommend that WSDOT continue to study retaining the elegance of hugging the natural grade, this should not come at the expense of a consistent design for the entire Portage Bay span."

- Memorandum: Recommendations for the Portage Bay Bridge and Montlake Lid components of the SR 520 Replacement Project
Seattle Design Commission, September 17, 2014

Study sections

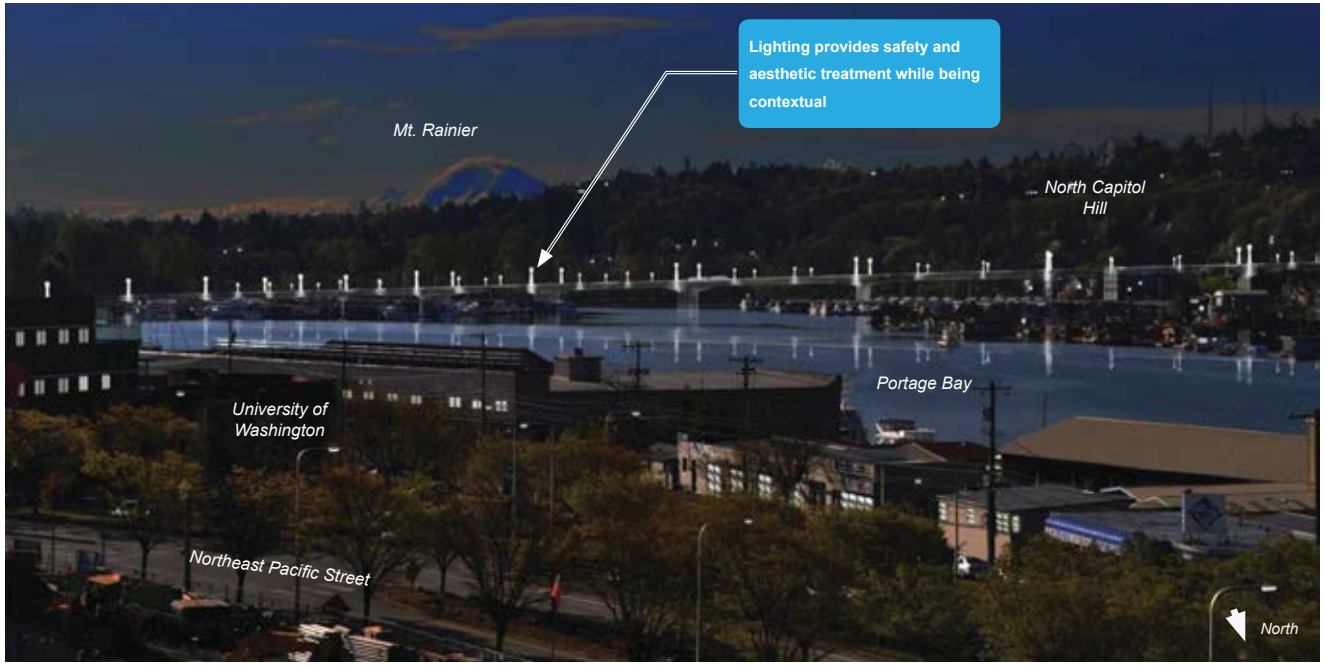
Box girder: *Portage Bay Bridge elevation of box girder bridge with shared-use path looking north from Montlake Playfield.*

Cable stay: *Portage Bay Bridge elevation of cable stay bridge with shared-use path looking north from Montlake Playfield.*

Existing conditions

Cable stay: *Portage Bay Bridge from University Bridge looking southeast toward Mt. Rainier (night view).*

Final Concept Design



Box girder: *Portage Bay Bridge from University Bridge looking southeast toward Mt. Rainier (nighttime view).*

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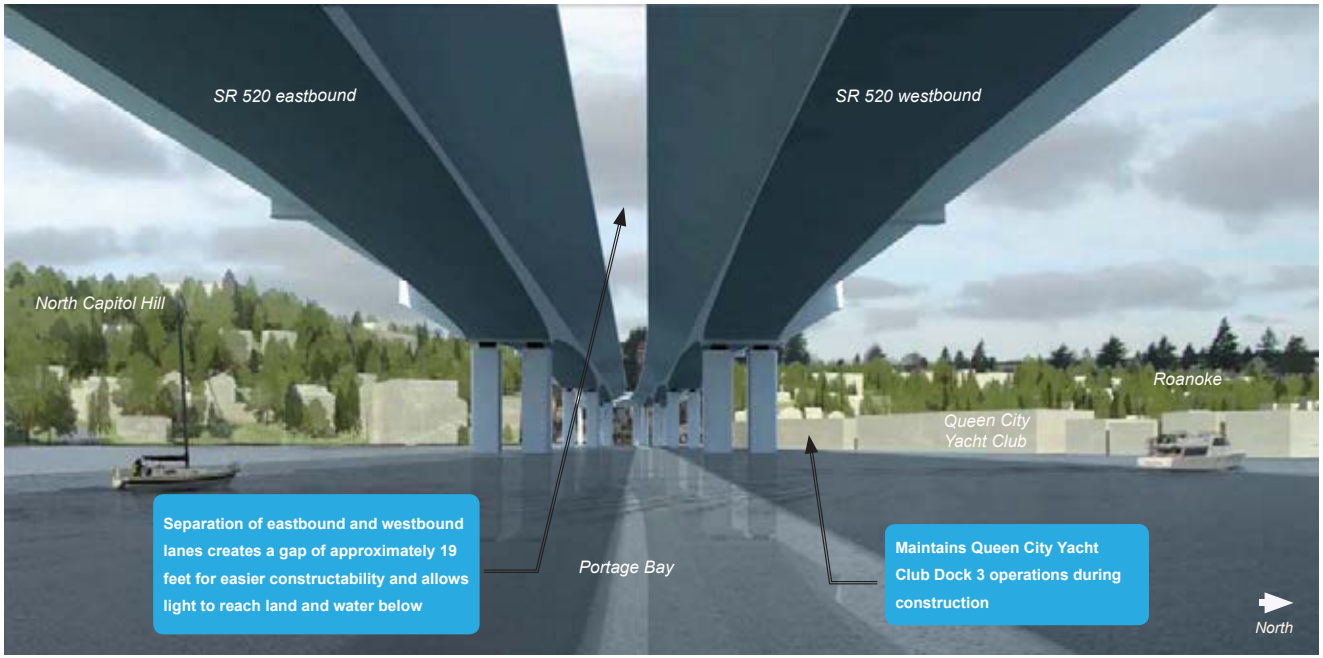
Cable stay: *View of Portage Bay Bridge from the water, looking west toward Queen City Yacht Club, Roanoke and North Capitol Hill.*

VIEW 3:
Portage Bay

"Maximize the amount of natural light that reaches the water and land. To accomplish this, pursue greater horizontal separation between the east- and westbound bridge segments."

-Memorandum: Recommendations for the Portage Bay Bridge and Montlake Lid components of the SR 520 Replacement Project
Seattle Design Commission, September 17, 2014

Final Concept Design



Box girder: *View of Portage Bay Bridge from the water, looking west toward Queen City Yacht Club, Roanoke and North Capitol Hill.*

Study sections

Cable stay: *Portage Bay Bridge cross-section of cable stay bridge with shared-use path looking west.*

Box girder: *Portage Bay Bridge cross-section of box girder bridge with shared-use path looking west.*

VIEW 4:

Regional Shared-Use Path

"To accommodate different users within the corridor, whose use varies based on speed, skill, and field of vision, consider any bridge design from all perspectives including on, above, and below the bridge and from various vantage points."

- Memorandum: Recommendations for the Portage Bay Bridge and Montlake Lid components of the SR 520 Replacement Project
Seattle Design Commission, September 17, 2014

Background and context

The Portage Bay Bridge spans across the waters of Portage Bay, linking the Montlake area with the Roanoke area. The existing bridge provides vehicular access only. Public feedback during the 2012 SCDP supported the addition of a shared-use path across the bridge to provide an additional, more efficient and accessible alternative for bicyclists and pedestrians between downtown Seattle and Montlake. The shared-use path was determined to be compatible with either bridge type.

Design refinements

- Provide a new non-motorized connection on the bridge with the addition of shared-use path to the south side of the bridge.
- Create alternate and accessible routes to and from the bridge on both ends that are safe, intuitive and accessible.
- Improve accessibility, mobility and safety with a constant bridge profile of 2.6 percent.

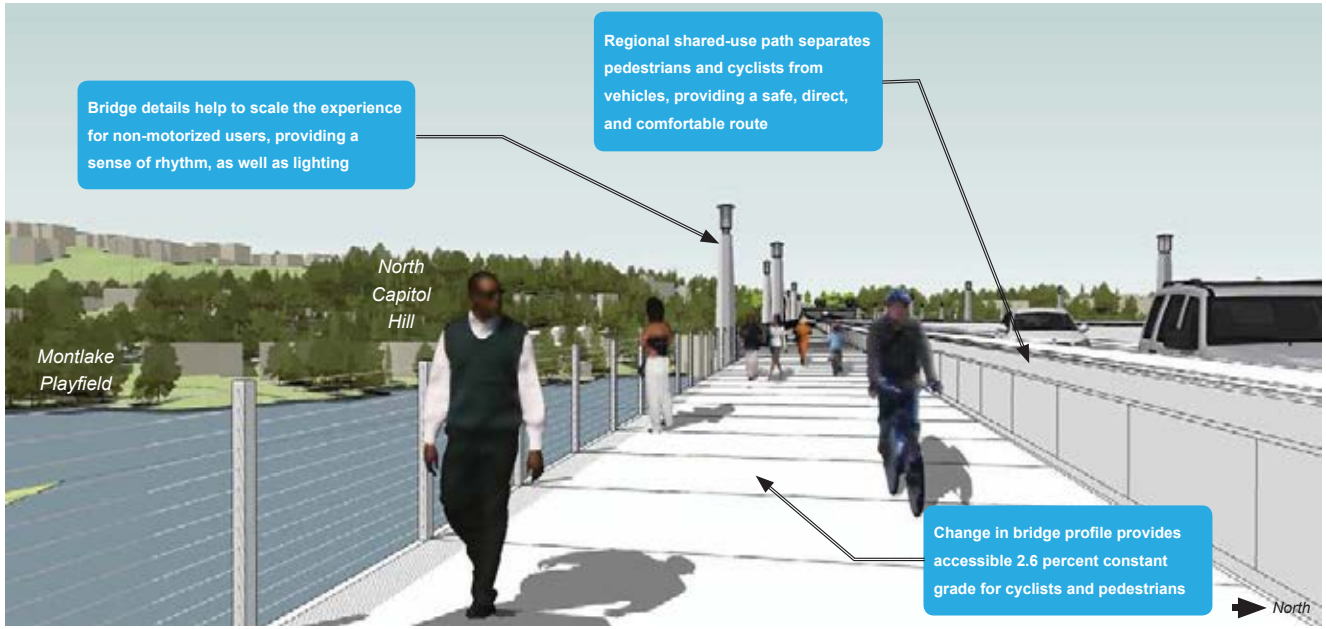
Design intent

- Egress points to and from the bridge at both ends should be architecturally and contextually integrated with the bridge.
- Meet National Association of City Transportation Officials (NACTO), WSDOT, and city of Seattle design standards for shared-use facilities.

Existing conditions

Cable stay: *Portage Bay Bridge shared-use path looking west.*

Final Concept Design



Box girder: *Portage Bay Bridge shared-use path looking west.*

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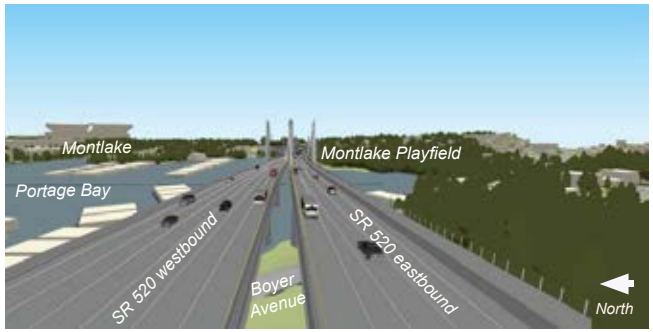
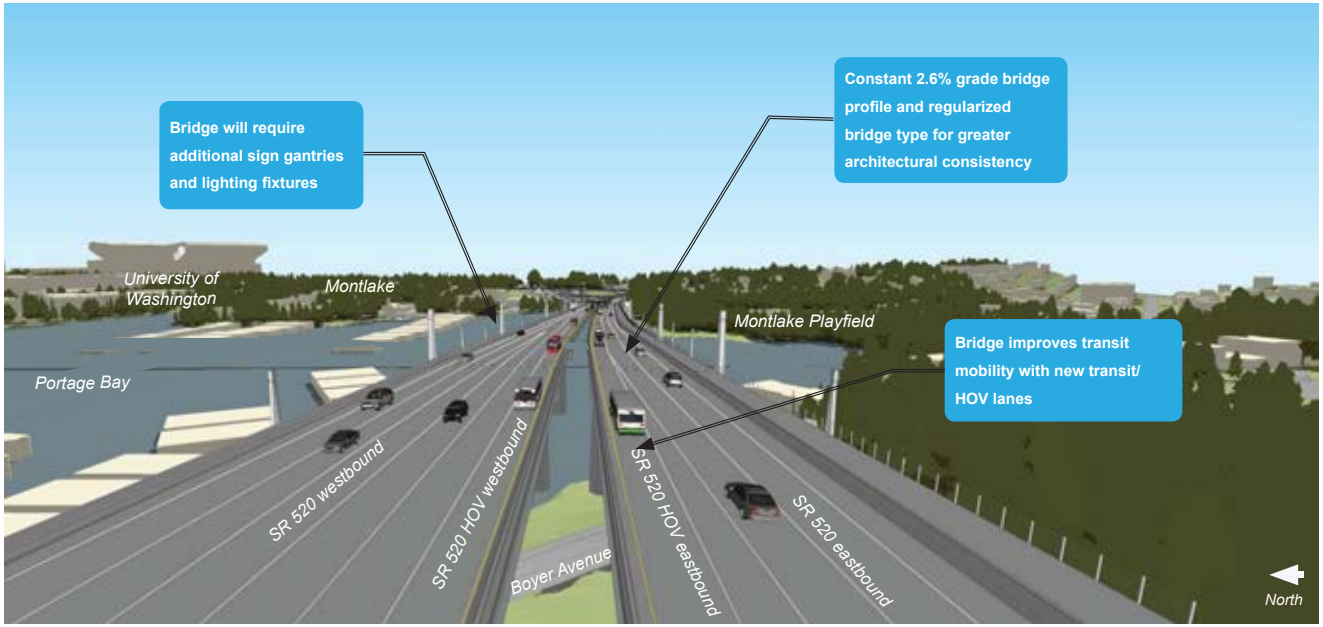
Existing conditions



Cable stay: *Portage Bay Bridge at the 10th and Delmar lid, view east toward Montlake.*

Final Concept Design



Box girder: *Portage Bay Bridge at the 10th and Delmar lid looking east toward Montlake.*

VIEW 5:

10th and Delmar Lid

"Closely examine where each bridge section lands near Montlake Boulevard East to the east and 10th Avenue East and Delmar Drive East to the west in order to integrate the project within the urban fabric of each neighborhood. Pay special attention to how the design affects deck heights at both ends and the experience and networks of cyclists and pedestrians."

- Memorandum: Recommendations for the Portage Bay Bridge and Montlake Lid components of the SR 520 Replacement Project
Seattle Design Commission, September 17, 2014

Background and context

The Portage Bay Bridge is an important connection from the Montlake neighborhood and the University of Washington to the Roanoke and North Capitol Hill neighborhoods and to I-5 and destinations north and south. Improved transit and non-motorized access and mobility are key goals for the bridge, while ensuring its aesthetic integration into the surrounding area and an improved experience for all users through context-sensitive design solutions.

Design refinements

- Utilize architectural elements to improve the bridge experience in terms of views, sense of scale, and rhythm to and through for all users.

Design intent

- Ensure safety and mobility of all users through the inclusion of design speed standards for 45 miles per hour.
- Lighting, signage and other utilities should be designed and configured to be integrated with the structure of the bridge for aesthetics and structural logic.

VIEW 6:
NOAA Shoreline

"Any bridge design should emphasize lightness in appearance and scale and complement its location within Portage Bay. This is particularly important given the size and number of columns below the deck, which should be reduced as much as possible in number and prominence."

- Memorandum: Recommendations for the Portage Bay Bridge and Montlake Lid components of the SR 520 Replacement Project
Seattle Design Commission, September 17, 2014

Background and context

The Portage Bay Bridge is located in a dynamic ecological and urban setting surrounded by parks, residences, educational institutions, and federal research centers as well as retail and recreational opportunities. The bridge lies just north of the Montlake Playfield and the Montlake Community Center and directly south of the National Oceanic and Atmospheric Administration facility, Seattle Yacht Club, and the Queen City Yacht Club. Portage Bay is the site of recreational boating as well as bird watching, sports activities, community gatherings and research.

Design refinements

- Improve experience and access for watercraft under the bridge at the east end.
- Improve views and reduce environmental impacts by reducing the number of in-water pier structures.
- Create a more structurally and aesthetically consistent bridge type across the length of the bridge.

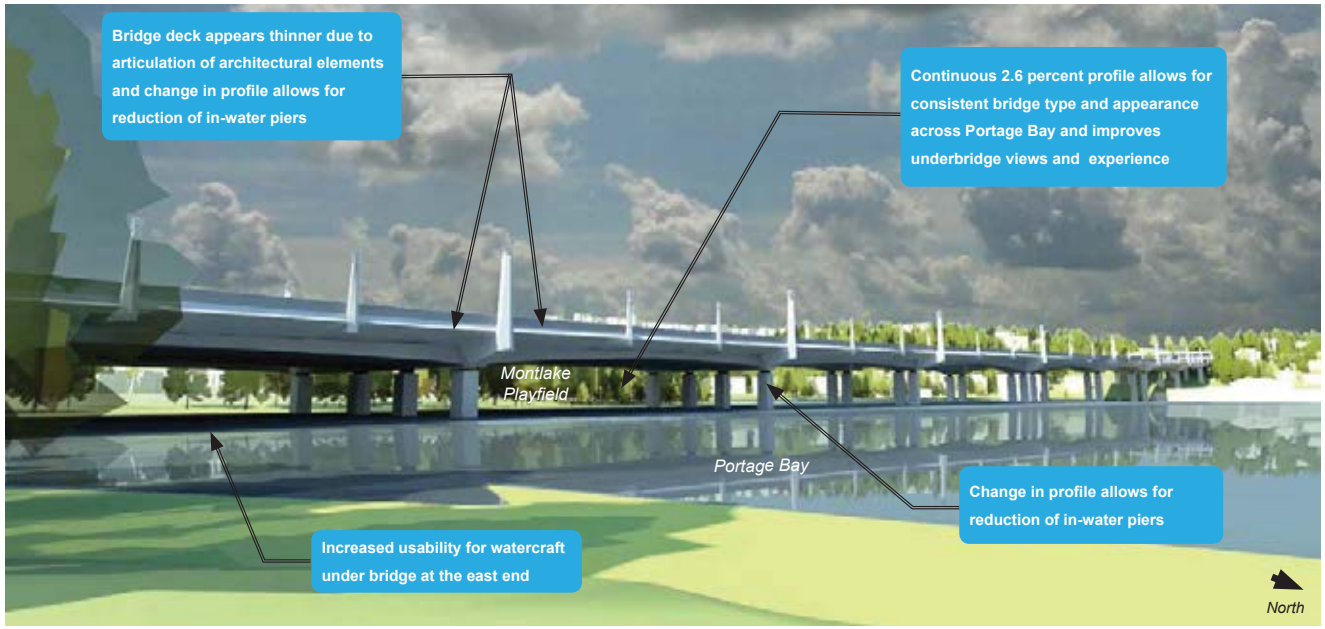
Design intent

- Reduce material quantities and overall carbon footprint.

Existing conditions (Source: Google maps)

Cable stay: *Portage Bay Bridge from the shoreline near NOAA, looking southwest.*

Final Concept Design



Box girder: *Portage Bay Bridge from the shoreline near NOAA, looking southwest.*

Washington State Department of Transportation
City of Seattle

"..[T]he box girder bridge has the greatest potential for success in Portage Bay. However, to fully meet the vision and goals for this project, the box girder bridge must be well funded in order to be designed for this place and its context. If the budget is spare, the result will be a boxy, heavy highway bridge."

- Memorandum: Recommendations for the Portage Bay Bridge and Montlake Lid components of the SR 520 Replacement Project
Seattle Design Commission, September 17, 2014

Seattle Design Commission memorandum

In response to the 2012 Seattle City Council Resolution 31427, the Seattle Design Commission (SDC) worked with the project design team in 2014 to review and further advance the Portage Bay Bridge design. WSDOT presented design development to the SDC in three formal briefings and five additional workshops, for which a subcommittee convened to discuss advancing design. In addition, the SDC heard public feedback regarding the proposed bridge design refinements.

In September of 2014, the SDC issued a memorandum that summarized their recommendations based on the 2014 design refinement process described above. In the memo, the SDC stressed the importance of integrating architectural elements into the overall design of the bridge, including piers, pier caps, railings, the shared-use path, egress points, lighting fixtures, signage, and other utilities. (See Appendix E for the complete text of the SDC memorandum recommendations.)

Ultimately, the SDC endorsed the box girder bridge, explaining that "...the box girder bridge has the greatest potential for success in Portage Bay. However, to fully meet the vision and goals for this project, the box girder bridge must be well funded in order to be designed *for this place and its context.* If the budget is spare, the result will be a boxy, heavy highway bridge."

WSDOT/city of Seattle recommendations

Through work with the SDC subcommittee, WSDOT staff evaluated both the box girder and cable stay bridge types. Using the "SR 520 Portage Bay Bridge area evaluation matrix" (see page 25), the design team explored refinements to address issues of architectural character, constructability, connectivity, community context and public input, site conditions and the WSDOT design mandate of "Practical Solutions."

Box girder precedent: *I-35 North Bridge, Minneapolis, MN.*

Box girder precedent: *I-90 Bridge with integrated portal design. (Source: Wikimedia Commons)*

Through this work with the SDC and taking into account the input of an Expert Review Panel (ERP), WSDOT weighed many concerns in order to select a bridge type, including additional stakeholder feedback from the September 2014 SR 520 west side design public open house. Public input demonstrated support of the advanced conceptual design work for both bridge types with no clear consensus on a preferred bridge type.

As a result of the considerable design efforts in 2014, WSDOT has weighed the endorsement of the SDC, public feedback, the exploration of the design team and the analysis of the ERP and cost estimation process.

While there are many competing considerations in the selection of a bridge type for the Portage Bay Bridge, the primary goals are to design an aesthetically-pleasing, context-sensitive, constructable and cost-effective bridge. For these reasons, and other significant benefits, together WSDOT and city of Seattle staff recommend the box girder bridge type as the best-suited approach to the design of the Portage Bay Bridge.

Next steps

Next steps for design include capturing the 2014 Final Concept Design in engineering drawings in 2014-2015 and further developing the box girder bridge type. When funding is available from the legislature, WSDOT will be ready to move forward with Final Design and construction.

Careful consideration of the design of the connections of the shared-use path on either end of the bridge, among other areas of future work, will play an important role in the overall bridge design as well as its contextual compatibility and character.

WSDOT will also further consider the recommendations of the SDC, which in their memorandum urged the design team to:

- Allocate funding commensurate to the project's unique, dense location in order to produce an exceptional bridge.

MONTLAKE AREA

Introduction

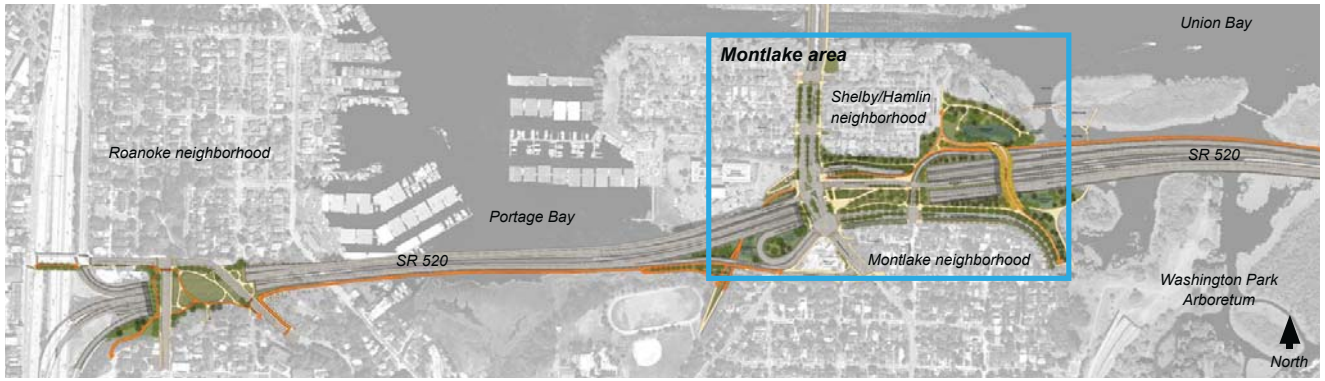
The Montlake area extends from Portage Bay on the west to Lake Washington's Union Bay on the east and spans the SR 520 and Montlake Boulevard East corridors. It is further defined by East Montlake Park and the Shelby/Hamlin neighborhood to the north and the Montlake neighborhood across East Lake Washington Boulevard to the south.

Within the Montlake area, the SR 520 corridor is surrounded by exemplary natural resources, public assets and open spaces. Within this rich and varied context, the project has the potential to create a stronger linkage between and among local and regional amenities such as the University of Washington, the Washington Park Arboretum, the Lake Washington shoreline, Montlake Playfield, Montlake Community Center, Portage Bay, and East and West Montlake Parks.

The Montlake area is also an urban neighborhood situated at a crossroads of activity and transportation routes. Montlake Boulevard (SR 513), the principal north-south roadway through the area, will connect to the future University of Washington light rail station and is a city of Seattle truck route and principal arterial as well as a designated piece of the city's historic, Olmsted-designed boulevard system. The Montlake neighborhood is historically significant and is currently in the process of being nominated as a Historic District on the National Register of Historic Places.

Amid this layering of natural, historic and community contexts, the Montlake lid bridges across the SR 520 highway to reconnect both neighborhoods and natural areas. The Final Concept Design for the Montlake area embodies the overall project vision of "Nature meets City" to provide a sensitive integration of urban infrastructure and natural systems.

This section provides an overview of the Final Concept Design for the Montlake area, including a design framework, options considered, key benefits of the design, and illustrations of specific design refinements.



Montlake study area

Design framework

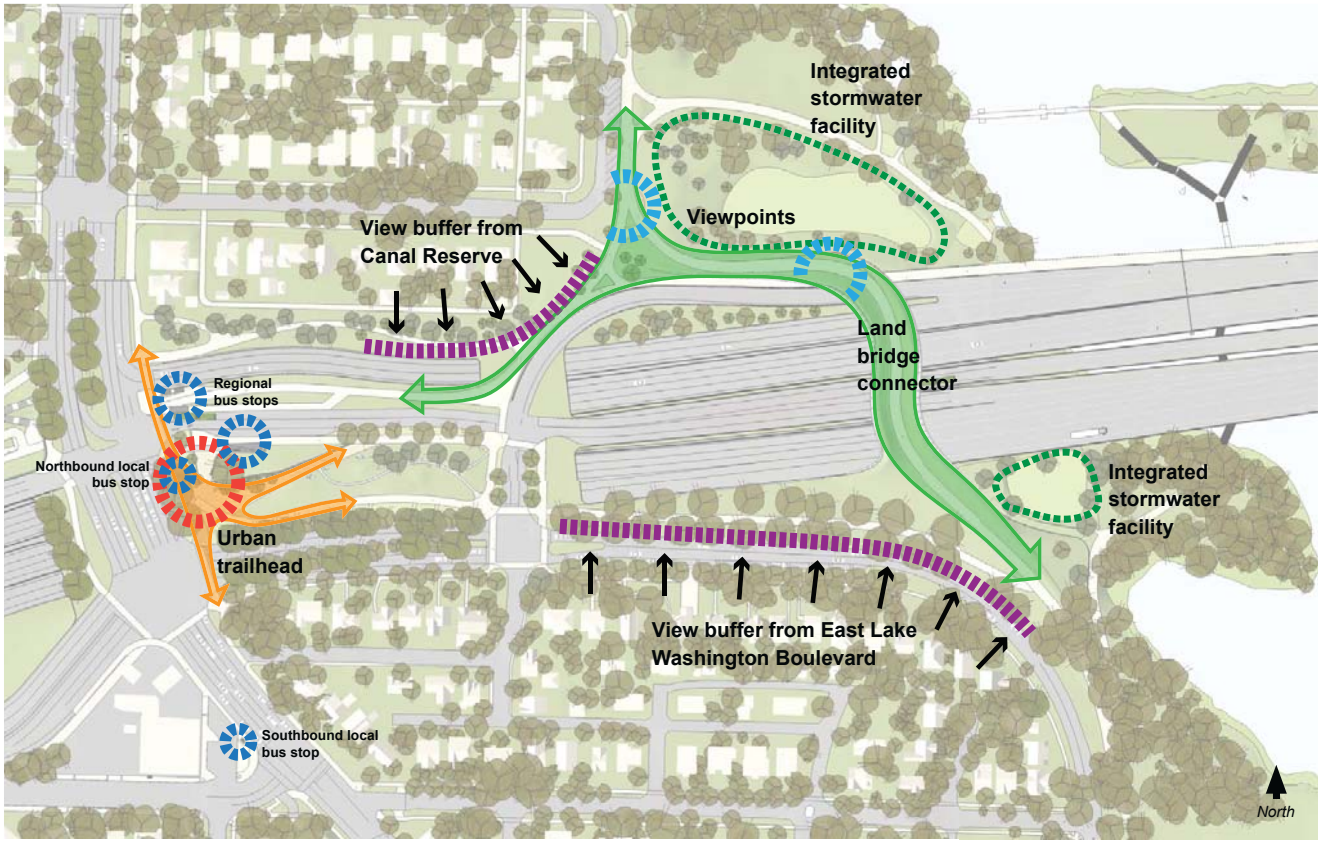
As part of the 2014 Final Concept Design work, the team built upon the overall project vision of "Nature meets City" to develop a design framework for the Montlake area that would serve as a guide for this next stage of design exploration and refinement. The design framework is composed of three components that work together to inform the Final Concept Design: a vision, a set of goals, and performance criteria for measuring the relative success of potential solutions in meeting those goals.

The SR 520, I-5 to Medina Project FEIS, which established the mobility, safety and environmental performance commitments of the Montlake lid, continues to serve as the "envelope" within which the project is designed.

The Seattle Design Commission endorses WSDOT's refined concept design for a "smarter" lid. This approach identifies the desired goals that the lid should achieve and then, through thoughtful moves, maximizes the planning, engineering, and design of the project to meet or exceed these goals with an emphasis on quality over quantity.

- Memorandum: Recommendations for the Portage Bay Bridge and Montlake Lid components of the SR 520 Replacement Project
Seattle Design Commission, September 17, 2014

Washington State Department of Transportation
City of Seattle



A diagrammatic illustration of design refinement program explorations in the Montlake lid area.

Montlake lid vision

The Montlake lid will reconnect Nature and City, acting as a gateway to the area's natural resources and extending the experience of the University of Washington Botanic Gardens across the SR 520 corridor. The lid will provide an urban, multimodal hub that facilitates exceptional connections for those travelling to and through the area.

Montlake lid goals

The refined vision for the Montlake lid represents the further development of the 2012 Preliminary Concept Design. The design team engaged in targeted design explorations in order to respond to feedback received from the Seattle Design Commission, Seattle City Council, and community stakeholders.

To provide continuity with the SCDP work, the design team explored a lid design that continues to be grounded in the project principles of utility, sustainability and expression. The team developed a set of goals that address the feedback received to date in order to support better connections, a more sustainable configuration, and more purposeful open space.

The smarter lid does not merely become a destination; the reductions in grade improve multimodal connections along the SR 520 corridor, across the Montlake Cut, and through the neighborhood.

- Memorandum: Recommendations for the Portage Bay Bridge and Montlake Lid components of the SR 520 Replacement Project
Seattle Design Commission, September 17, 2014

Goals for Montlake lid design refinement

- **Utility:** Provide non-motorized connections that are more direct, intuitive and safe for all users.
- **Sustainability:** Reduce material use and energy consumption of the infrastructure.
- **Expression:** Enhance and activate open space while considering views and the gateway experience.

Utility: Better connections

- Provide better regional and neighborhood non-motorized connections for users of all ages and abilities with more options for direct, convenient, intuitive and safe access to existing and future networks and destinations.
- Improve transit user experience with better places for transit users and more direct connections to transit stops.
- Maintain the vehicular function of the SR 520, I-5 to Medina Final Environmental Impact Statement (FEIS) Preferred Alternative channelization.

Sustainability: Less is more

- Implement practical solutions to the lid configuration that reduce material and energy consumption during construction and throughout the life of the structure.
- Improve ecological connectivity in and around the project through better integration of stormwater treatment with adjacent wetland areas and reduction of man-made structures near the shoreline.
- Improve noise and air quality compared to the No Build alternative in the SR 520, I-5 to Medina FEIS.

Expression: Quality open space

- Create safe and functional spaces that attract users and encourage positive activity.
- Incorporate project elements and open spaces that are designed at a human scale with particular attention to existing community character and historic context.
- Create a memorable and layered gateway experience.

Evaluation of design explorations

The next step in the design process was to use the vision as guidance to identify specific opportunities for design explorations that would help the project to meet the established goals. Where possible, the team explored design solutions that achieve multiple benefits in addressing the stated goals.

The "SR 520 Montlake lid area evaluation matrix" (p. 43) summarizes the design explorations that contributed to the Final Concept Design as they relate to the organizing principles of utility, sustainability, and expression. Qualitative and quantitative benefits of the design illustrate the realization of these explorations in the physical and programmatic design of the lid. Finally, the performance of the Final Concept Design was measured against the 2012 Preliminary Concept Design to assess the extent to which the Final Concept Design better achieves the goals of the project.

Although vehicular function, air quality and noise measures remain comparable to the 2012 Preliminary Concept Design, the Final Concept Design achieves improved performance in many areas, including non-motorized connectivity, safety, and user experience. The key benefits of the Final Concept Design are highlighted on pp. 46-47.

What we explored

At the close of the 2012 Seattle Community Design Process, the Seattle Design Commission provided the following feedback:

> *"The open surface of the lid has never been embraced as a compelling destination or place for active users…Can we achieve goals of north-south connections through much different designs? We are advocates for a 'smart lid,' not necessarily a large lid."*

The design team also received feedback from Seattle City Council with the passage of Resolution 31427 in February of 2013 (see Appendix I). Although the resolution confirmed Council concurrence with many of the design recommendations for the Montlake area, it directed the city and the State to reexamine and consider a wider range of options for the Montlake lid. Using this direction in combination with feedback received from community stakeholders during the SCDP, the design team established a set of goals focused on the project guiding principles of sustainability, utility, and expression.

Although this document presents one Final Concept Design, many options and alternatives were considered during the course of the 2014 design revisions. The team worked iteratively in collaboration with the Seattle Design Commission and evaluated many alternative configurations for the Montlake lid and its associated connections. The design sketches on pp. 44 and 45 illustrate some of the lid configuration options considered during the design process. The Final Concept Design was developed by incorporating the features of those explorations that performed best in accordance with the Montlake lid area evaluation criteria (see p. 43).

The Final Concept Design responds to the stated goals by reconnecting Nature and City via a smarter lid that requires less energy and fewer materials to build, makes better local and regional connections across and along SR 520, and is better integrated into its community surroundings.

SR 520 Montlake lid area evaluation matrix

	Montlake Lid Goals*	Design Explorations**	Benefits of the Refined Concept	Performance
UTILITY	**Regional & neighborhood non-motorized connections** • Provide better regional and neighborhood non-motorized connections for users of all ages and abilities with more options for direct, convenient, intuitive and safe access to existing and future networks and destinations	• Provide safe, direct and comfortable routes on regional shared-use facilities and smooth transitions to neighborhood networks, including a variety of connectivity options for users of all ages and abilities • Provide seamless, at-grade regional path connections • Help achieve 2014 City of Seattle Bicycle and Pedestrian Master Plan goals • Reduce pedestrian and bicycle crossing distances, meeting National Association of City Transportation Officials (NACTO) standards for pedestrian crossing times where possible • Provide enhancement and safety features, such as raised crosswalks, at crossings • Provide an enhanced buffer and improved connections along both sides of Montlake Boulevard East	• More regional pathway connections; at-grade north-south connection • More path options for users of all ages and abilities • 25% reduction in crossing distances along Montlake Boulevard East • 100% increased buffer on Montlake Boulevard East • Target crossing compliance with 2.5 feet-per-second NACTO standard • Continuous pedestrian paving material at north-south crosswalks	
	Transit user experience • Improve transit user experience with better places for transit users and more direct connections to transit stops	• Improve access and create better spaces for transit users by enhancing bus stop areas and pedestrian connections, including reducing pedestrian crossing distances on transit transfer routes	• Crosswalk improvements, including raised or textured crossings, and widened pathways improve transit rider experience	
	Vehicular function • Maintain the vehicular function of the SR 520, I-5 to Medina Final Environmental Impact Statement (FEIS) Preferred Alternative channelization	• Retain functionality and baseline channelization of the Preferred Alternative configuration while improving nonmotorized connectivity	• No change from Preferred Alternative channelization and functionality • Shorter pedestrian crossings and improved intersection treatments	
SUSTAINABILITY	**Practical solutions** • Implement practical solutions to the lid configuration that reduce material and energy consumption during construction and throughout the life of the structure	• Explore a smarter lid design that eliminates the need for large operations and maintenance facilities and ventilation stacks • Explore a more sustainable lid design that optimizes lid length in order to reduce use of resources such as concrete and steel, imported soil, and operational energy	• 30% less concrete and steel needed for construction • 11,500-square-foot operations and maintenance facility eliminated • Four 20-foot-tall, 30-foot-wide ventilation stacks eliminated • 20% reduction in energy use and maintenance costs • Less soil import for construction	
	Ecological connectivity • Improve ecological connectivity in and around the project through better integration of stormwater treatment with adjacent wetland areas and reduction of man-made structures near the shoreline	• Improve stormwater facility integration with the surrounding context of parks, wetlands and shoreline areas • Enhance shoreline habitat by minimizing the number of man-made structures near the shoreline • Meet or exceed FEIS enhanced stormwater treatment goals for the West Approach Bridge and the Portage Bay Bridge	• Better integration of stormwater treatment facility with surroundings • Removal of operations and maintenance facility from shoreline area • Stormwater facilities meet standards for enhanced treatment	
	Air quality & noise • Improve noise and air quality compared to the no-build alternative in the SR 520, I-5 to Medina FEIS	• Explore alternative lid configurations while improving air quality and reducing noise levels compared to the No Build alternative in the 2011 SR 520, I-5 to Medina FEIS	• Preliminary analysis suggests that air quality and noise levels will not trigger any new impacts. Noise levels will not be noticeably louder. Air quality will be better than State and National standards	
EXPRESSION	**Safe & purposeful spaces** • Create safe and functional spaces that attract users and encourage positive activity	• Create purposeful, functional open spaces that also function as landscape connectors • Comply with Crime Prevention Through Environmental Design (CPTED) principles for safe spaces, including continuity of sight lines at undercrossings • Optimize the height, width and comfort of undercrossing spaces for pedestrian and bicyclist safety and comfort	• All open spaces are designed to also function as connections • All undercrossings have uninterrupted lines of sight • Minimum 10-foot height and 20-foot width for undercrossings; all undercrossings have separated bicycle and pedestrian facilities and uninterrupted lines of sight • The west lid functions as a vibrant urban trailhead for gathering and making connections to community spaces and regional amenities	
	Human scale & community character • Incorporate project elements and open spaces that are designed at a human scale with particular attention to existing community character and historic context	• Protect quality of views from adjacent parks and pathways and improve visual quality of open spaces • Comply with Section 106 commitments for legible and consistent wayfinding through planting, interpretive signage, and other environmental cues • Integrate the project with the neighborhood's physical and Olmstedian context by extending the University of Washington Botanic Gardens experience and native ecology across the SR 520 corridor and along shorelines • Ensure that open spaces and project elements are designed at a human scale, including reducing the height of lid walls at lake and park edges	• Screening of roadway facility from adjacent public spaces maintained • Height of lid walls reduced • Pathway at east shoreline is pulled away from the water's edge for better user experience and more continuous shorline habitat • UWBG collections are extended across the SR 520 corridor • Complies with Section 106 commitments	
	Gateway experience • Create a memorable and layered gateway experience	• Create a layered sequence of gateways to reconnect Nature and City, particularly at land/water thresholds • Provide a hierarchy of defined gateway experiences for users of all modes	• Driver exposure to vegetation along SR 520 • Defined primary and secondary gateways	

** Goals were developed in response to public feedback from the Seattle Community Design Process (2012), Seattle Design Commission Memorandum Urgent Process and Design Recommendations for SR 520* (September 2012) and *Seattle City Council Resolution Number 31427 (February 2013).*

***Design explorations build on and refine the Preferred Alternative documented in the 2011 FEIS and the 2012 Preliminary Concept Design.*

Key
- *Improvement over Preliminary Concept Design*
- *Similar to Preliminary Concept Design*

City of Seattle | Washington State Department of Transportation

Lid precedents studied

Olympic Sculpture Park, Seattle, WA. (Source: Weiss Manfredi)

Arch Grounds Competition, St. Louis, MO. (Source: MVVA)

Freeway Park, Seattle, WA. (Source: Dwell.com)

Freeway Park, Seattle, WA. (Source: greatbuildings.com)

Community Connector Proposal, Vancouver, WA. (Source: Gustafson Guthrie Nichol)

I-90 lids, Mercer Island, WA. (Source: Google Maps)

Design options explored

Pros

- ***Utility:*** Large land bridge near the shoreline provides direct, separated north-south connection across SR 520.
- ***Sustainability:*** Perforated lid results in reduced life cycle cost of infrastructure.
- ***Expression:*** Land bridge enhances corridor gateway experience.

Cons

- ***Utility:*** Does not provide separated pedestrian and bicycle route as an alternative to Montlake Boulevard East on the west side of the lid.
- ***Expression:*** Perforation near Montlake Boulevard East makes the lid area less useable.

Pros

- ***Utility:*** Narrow land bridges connect across SR 520 to east and west of interchange.
- ***Sustainability:*** Shorter lid results in reduced life cycle cost of infrastructure.
- ***Expression:*** Land bridge enhances corridor gateway experience.

Cons

- ***Utility:*** West land bridge does not serve desire line along Montlake Boulevard East.
- ***Expression:*** Structure of pedestrian bridge over Montlake Boulevard East does not reduce visibility of infrastructure.

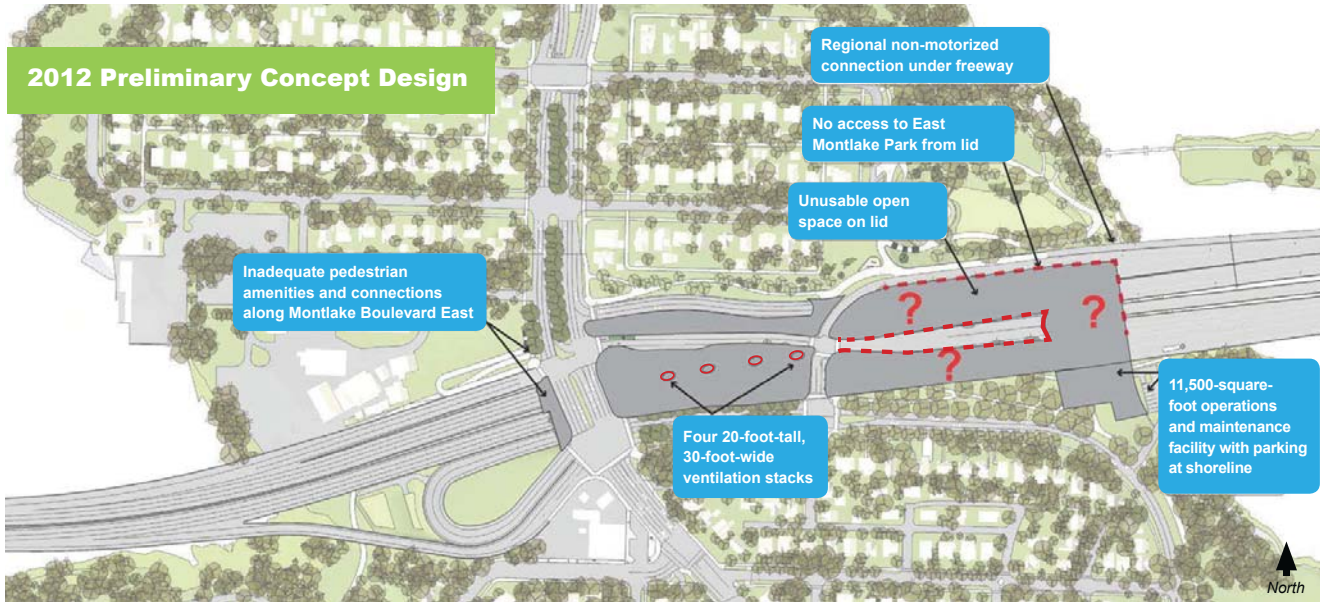
Option Z

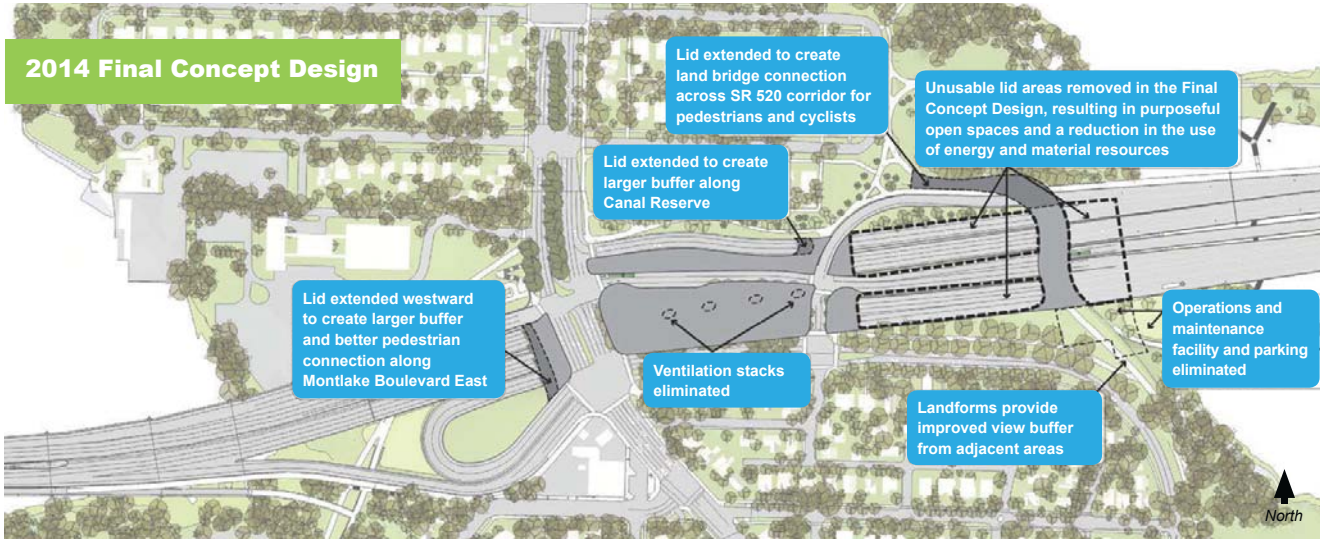
Pros

- ***Utility:*** Improved east-west non-motorized and ecological connections south of SR 520.
- ***Sustainability:*** Shorter lid results in reduced life cycle cost of infrastructure.
- ***Expression:*** Removal of on- and off-ramp cloverleaf allows for increased green space buffer of roadway.

Cons

- ***Utility:*** Reconfiguration of off-ramp has negative effect on traffic flow.
- ***Expression:*** Structure of pedestrian bridge over Montlake Boulevard East does not reduce visibility of infrastructure.

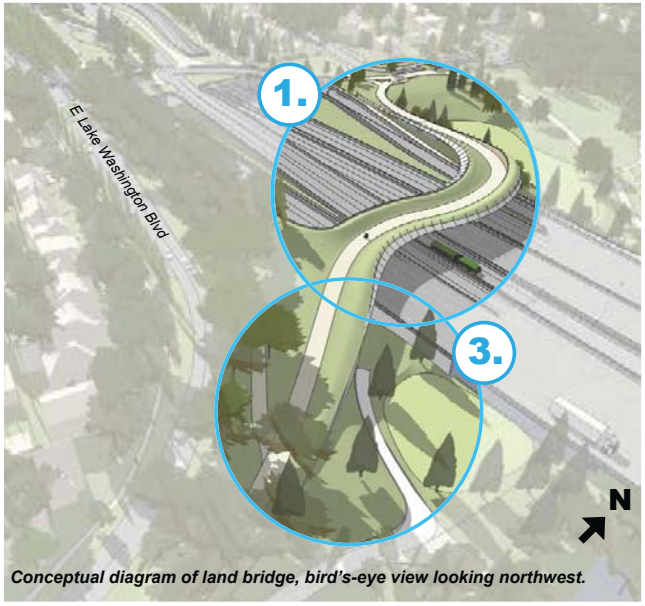




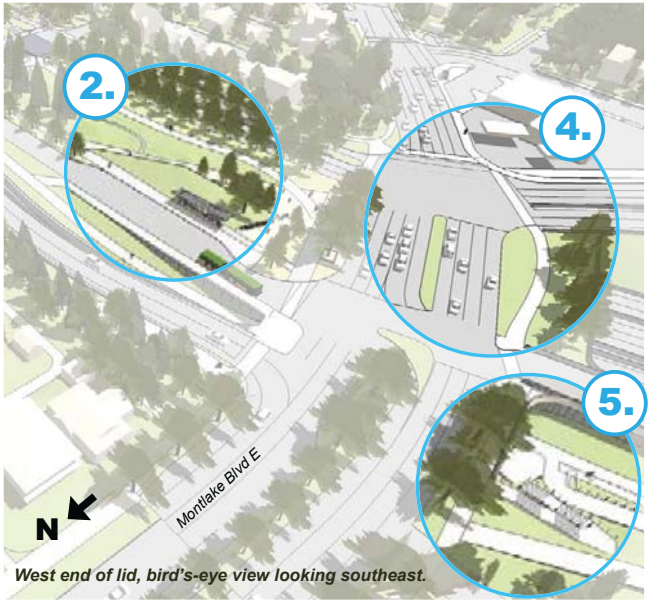
KEY BENEFITS OF THE SMARTER LID

Overview of key benefits

The refined vision for the Montlake lid area responds to feedback gathered from the Seattle Design Commission, Seattle City Council, and community stakeholders. Several examples of the key benefits of the Final Concept Design for the Montlake lid are highlighted in this section. Although only one example per key design response is illustrated here, these benefits have been incorporated in many instances throughout the project area and can be seen in the detailed design refinements illustrated in the following pages of this section. The Final Concept Design provides comparable benefits to the Preliminary Concept Design in terms of air quality and noise levels.



Conceptual diagram of land bridge, bird's-eye view looking northwest.



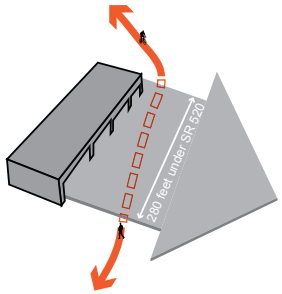
West end of lid, bird's-eye view looking southeast.

What are the benefits of the smarter lid?

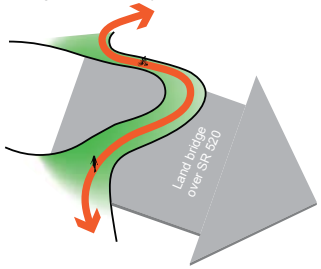
- The 800-foot lid length eliminates the requirement for an 11,500-square-foot operations and maintenance facility and a series of four 20-foot-tall, 30-foot-wide ventilation stacks on the lid.
- The smarter lid requires fewer materials and resources to construct.
- The smarter lid requires less intensive long-term maintenance with fewer buildings and less mechanical equipment.
- Open spaces are purposefully designed to provide meaningful regional and local connections and to extend the ecological function of the University of Washington Botanic Gardens across the SR 520 corridor.
- The reduced structural depth of the lid allows for an at-grade, separated north-south pathway that connects across the entire lid.
- The north-south regional path connection that was previously routed under the SR 520 mainline at the water's edge now makes an accessible connection across the highway via a new land bridge.
- The Final Concept Design better meets the EIS Section 106 commitment of "context-sensitive solutions" (see Appendix A).

1. Better regional connections

The principal north-south shared-use regional path previously passed under 280 feet of highway with 10 feet of clearance; the experience of the shoreline was compromised by an operations and maintenance facility. The gentle slope of the land bridge now creates an at-grade, accessible north-south regional connection across the SR 520 corridor and enables more intuitive wayfinding along the pathway.



Preliminary Concept Design



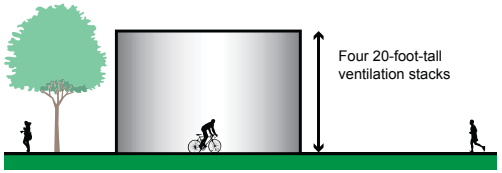
Final Concept Design

Preliminary Concept Design
(view along Lake Washington shoreline looking north)

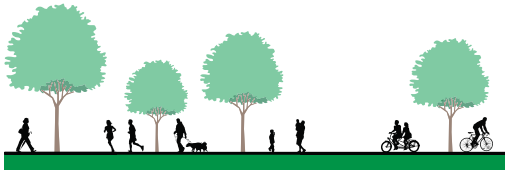
Final Concept Design
(view along land bridge looking north)

2. More useable open space

The Preliminary Concept Design required four 20-foot-tall, 30-foot-wide vent stacks on the lid, resulting in low-quality open space. The vent stacks are no longer required, resulting in more useable and enjoyable open spaces.



Preliminary Concept Design



Final Concept Design

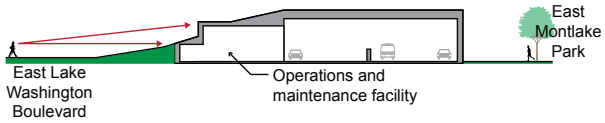
Preliminary Concept Design
(view across lid looking east)

Final Concept Design
(view across lid looking east)

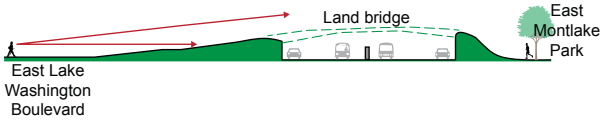
3. Buffered views of the roadway

The community expressed concerns about the visibility of the roadway from adjacent areas. The Final Concept Design provides a better visual buffer of the freeway with landforms and retaining walls.

Preliminary Concept Design



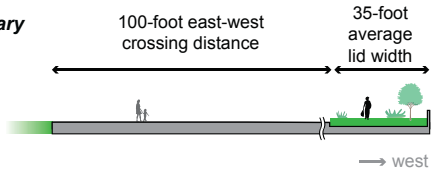
Final Concept Design



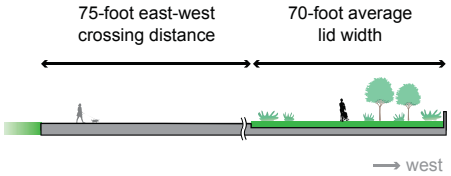
4. Improved pedestrian experience

Community members requested better pedestrian spaces and buffers along Montlake Boulevard East. Improvements include a lid extension to the west and shorter crossing distances at the intersection of Montlake Boulevard East and East Lake Washington Boulevard.

Preliminary Concept Design

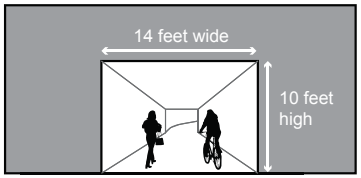


Final Concept Design

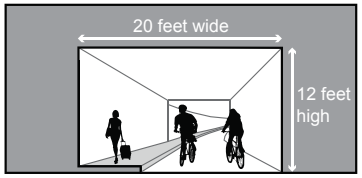


5. Safer undercrossings

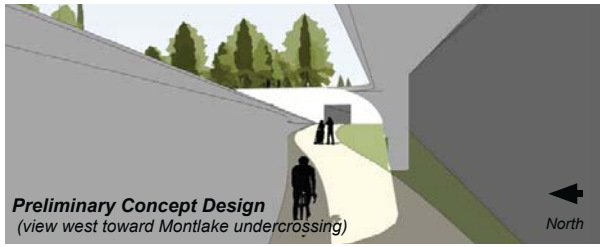
Community feedback expressed concern regarding the safety and quality of undercrossings. Passages have been redesigned to provide mode separation and improved lines of sight for users.



Preliminary Concept Design *(14-foot-wide passageway)*



Final Concept Design *(20-foot-wide passageway)*



Preliminary Concept Design
(view west toward Montlake undercrossing)

Final Concept Design
(view west toward Montlake undercrossing)

MONTLAKE AREA: OVERVIEW OF THE FINAL CONCEPT DESIGN

Introduction

This section provides a more detailed overview of the design advancement of specific project areas and elements based on public feedback and direction from the Seattle Design Commission and Seattle City Council in 2012.

In 2012, the Seattle Design Commission recommendations to WSDOT included:

- Prioritize non-motorized connections.
- Maximize the quality and functionality of the lid space, provide activated open spaces and enhance the user experience.
- Better integrate the program within the neighborhood and its context.

Seattle City Council requested the exploration of a wider range of design options for the lid itself. With this feedback in mind, the design team created recommendations for improving local and regional connectivity, ensuring that open spaces are purposeful, and improving community character.

Local and regional connectivity

The Montlake lid plays an important role in facilitating both regional and local connections. It will serve as the connector between regional shared-use path facilities on the West Approach Bridge and Portage Bay Bridge as well as the connective seam between the University of Washington and the Shelby/Hamlin neighborhood to the north of the SR 520 corridor and the Montlake and Capitol Hill neighborhoods to the south. As such, the lid has the potential to help facilitate the implementation of desired neighborhood bicycle and pedestrian connections identified in the city of Seattle's Bicycle and Pedestrian Master Plans.

Located at a nexus of intersecting paths of travel, the Montlake lid will also connect many points of interest and well-used routes, including the Bill Dawson Trail, Montlake Playfield, Montlake Boulevard East, East Montlake Park, and the Washington Park Arboretum. The Final Concept Design is focused on providing pedestrians and cyclists with as many travel options as possible, creating intuitive connections and multiple connectivity choices between and among regional and local networks.

The design of project intersections, pedestrian crossings, undercrossings and pathways have been refined in order to provide safer and more direct routes for non-motorized users of all ages and abilities in keeping with Crime Prevention Through Environmental Design (CPTED) principles. Specific safety and comfort improvements include:

- Narrower traffic lanes where possible.
- Raised crosswalks along Montlake Boulevard East where feasible.
- Increased lid buffer on the west side of Montlake Boulevard East.
- Crosswalk/crossing improvements at 24th Avenue East off-ramp intersections.
- Enlarged and mode-separated undercrossings.
- Improved pedestrian crossing distances, particularly the east-west crossing of Montlake Boulevard East at the SR 520 interchange.

Multifunctional open spaces

Throughout the project area, care has been taken to ensure that open spaces are not created just as a byproduct of lidding over the SR 520 facility, but that they are purposefully designed as places for people. Open space areas that were identified in the Preliminary Concept Design as potentially inaccessible or difficult to activate have been removed, and landscaped areas have been added at strategic locations to better screen the highway facility from the neighborhood, to provide better non-motorized connections and to create a more comfortable pedestrian experience.

Open spaces have been designed to provide meaningful and intuitive connections, both regional and local, extending the ecological and recreational function of the University of Washington Botanic Gardens across the SR 520 corridor. The layering of functions is a key concept behind the landscape expression of the Final Concept Design. All areas are designed with multiple purposes in mind, providing important project connections while also serving as view buffers or stormwater treatment areas.

Community character and context

SR 520 is a regional roadway facility located within an historic neighborhood. The Final Concept Design seeks to minimize large-scale infrastructure elements within project open spaces and to prioritize the experience of pedestrians and cyclists. Project elements have been designed at a human scale in keeping with Olmsted principles. In particular, attention has been paid to the scale of infrastructure elements, such as the lid walls, that will be seen from adjacent public parks, paths and boulevards.

Reducing the length of the lid in the Final Concept Design has multiple positive effects for community character and context. These benefits include removal of the 20-foot-tall stacks and allowing the shoreline area to be used for stormwater treatment instead of an operations and maintenance facility.

The profile of the lid has been lowered in the Final Concept Design, which allows the character of the Washington Park Arboretum to extend across the SR 520 corridor via the land bridge and a shoreline trail that is integrated into the network of Arboretum boardwalk pathways. The landscape design is focused on enhancing the urban forest canopy by providing trees at locations that maximize their long-term viability, including significant vegetation at the roadway level to reinforce the vision of "Nature meets City."

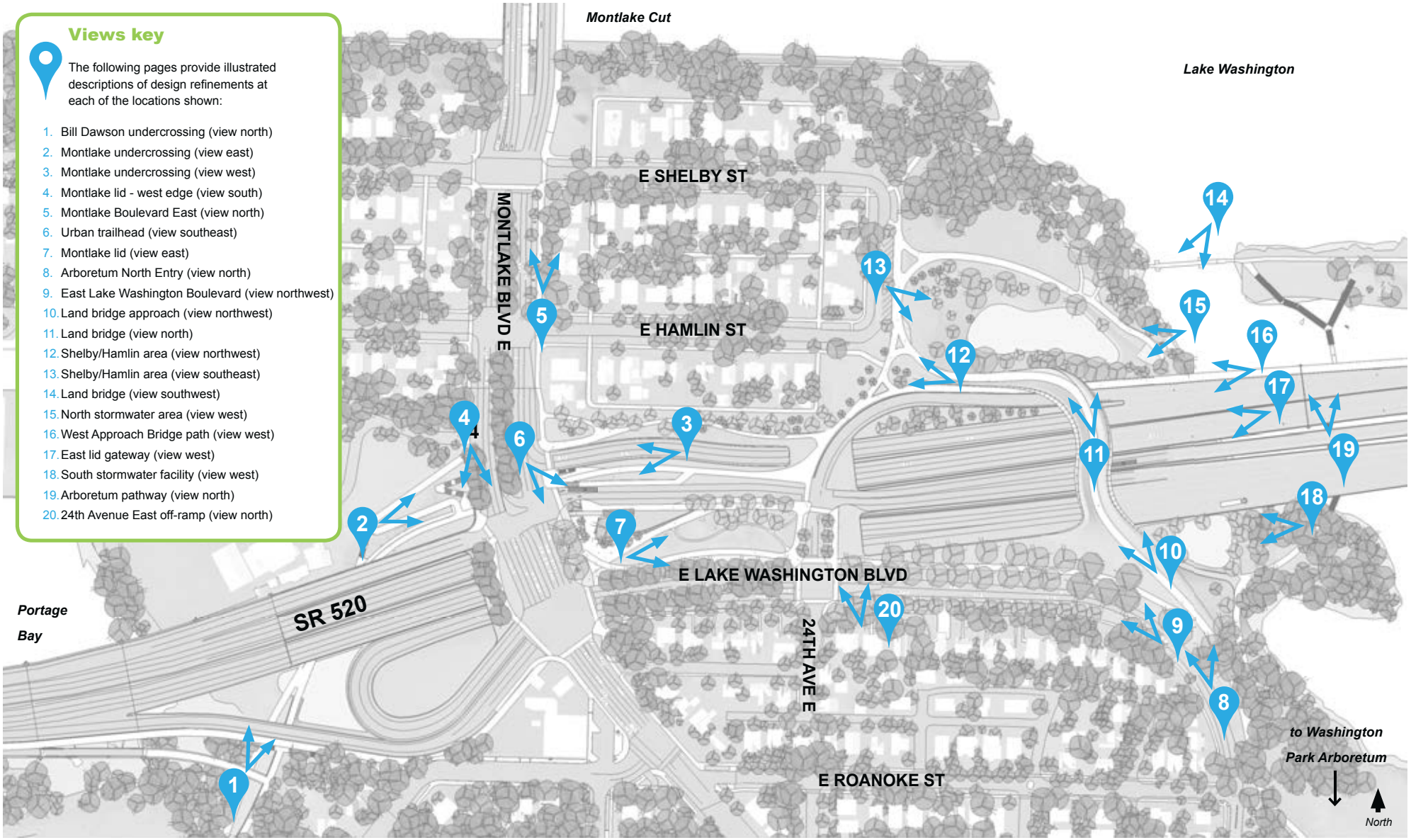
The following pages illustrate specific areas of the project that best exemplify the design refinements (see key map on p. 49). More information regarding the design intent for specific project elements can be found in Appendix A.

Note: Graphics in this section are conceptual and omit various site details such as lighting, signals, signage, ground-level vegetation, etc.

Views key

The following pages provide illustrated descriptions of design refinements at each of the locations shown:

1. Bill Dawson undercrossing (view north)
2. Montlake undercrossing (view east)
3. Montlake undercrossing (view west)
4. Montlake lid - west edge (view south)
5. Montlake Boulevard East (view north)
6. Urban trailhead (view southeast)
7. Montlake lid (view east)
8. Arboretum North Entry (view north)
9. East Lake Washington Boulevard (view northwest)
10. Land bridge approach (view northwest)
11. Land bridge (view north)
12. Shelby/Hamlin area (view northwest)
13. Shelby/Hamlin area (view southeast)
14. Land bridge (view southwest)
15. North stormwater area (view west)
16. West Approach Bridge path (view west)
17. East lid gateway (view west)
18. South stormwater facility (view west)
19. Arboretum pathway (view north)
20. 24th Avenue East off-ramp (view north)



VIEW 1:

Bill Dawson Undercrossing

Background and context

The Bill Dawson Trail provides an important non-motorized connection from Interlaken and Capitol Hill to the University of Washington via the Montlake neighborhood. The path is well-used by recreationists and commuters alike, but it is narrow, steep, and has poor sight lines where it passes under SR 520. Public feedback on the Preliminary Concept Design expressed continued concern about safety and visibility to and through the undercrossing.

Design refinements

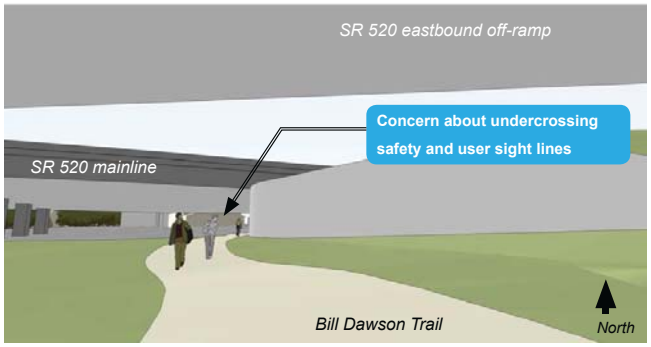
- Create a more inviting undercrossing, including clear lines of sight through and beyond the passageway in accordance with CPTED principles of natural surveillance.
- The undercrossing has been widened to 20 feet with separated lanes for pedestrians and bicyclists in the passage.
- New connection options include a path between the Bill Dawson Trail and the Portage Bay Bridge shared-use path and a stairway to Montlake Boulevard East.

Design intent

- **Undercrossings**
  - Curvature of the pathway within or outside the undercrossing should be minimized to maintain sight lines and to facilitate predictable behavior by users.
  - Alternate routes via stairs and ramps should be provided within or near the approach area and should be clearly visible from the opposite side of the undercrossing.
- **Urban trails**
  - Provide appropriate trail widths based on projected use and guidance.

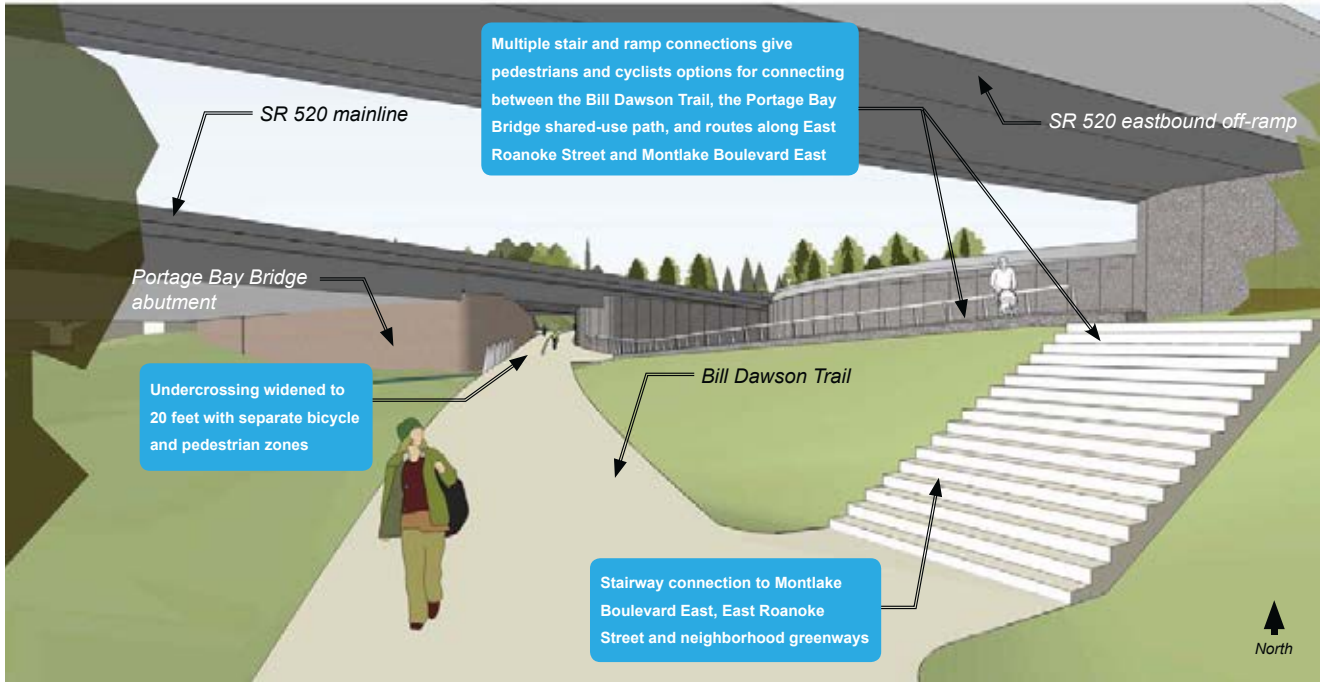
See Appendix A for more information on Design Intent.

Location Key: *View north along Bill Dawson Trail toward passage under SR 520.*



Preliminary Concept Design

Final Concept Design



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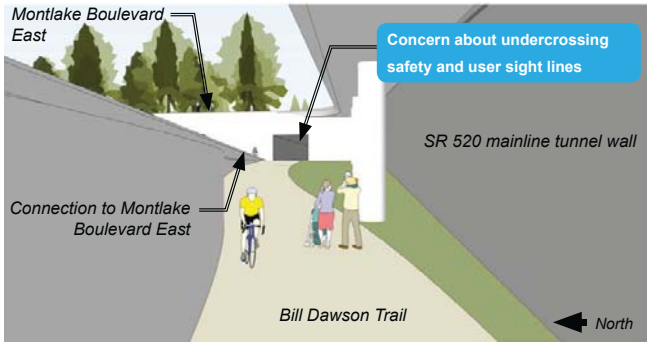
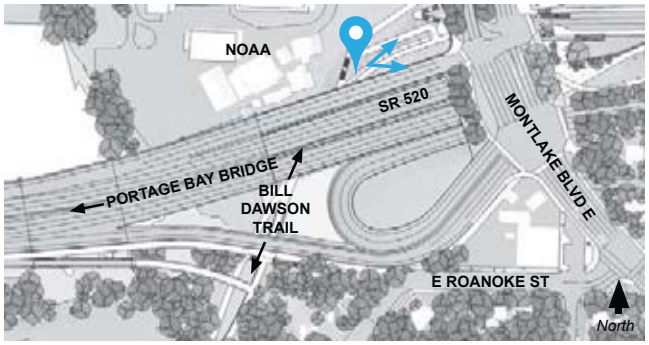


Preliminary Concept Design



Location Key: *View facing east toward passageway under Montlake Boulevard East.*

Final Concept Design

VIEW 2: Montlake Undercrossing

Background and context

The SR 520 project will provide a new separated regional connection between the Bill Dawson Trail and the shared-use path that passes under Montlake Boulevard East. The passage will provide access between the roadway network and the regional shared-use path on both sides of Montlake Boulevard East. Feedback on the Preliminary Concept Design included concerns about sight lines, safety, comfort, and potential user conflicts in and around the passageway.

Design refinements

- Provide separate bicycle and pedestrian pathways within a 20-foot-wide passageway.
- The trail and passageway have been repositioned so that users can see through the undercrossing before they enter it in accordance with CPTED principles of natural surveillance.
- Landings and transition spaces for stairs and ramps between the shared-use path and the roadway above have been enlarged.

Design intent

- **Undercrossings**
  - Lighting that illuminates the faces of others using the space should be provided at the approaches and within the undercrossings.
  - The design of walls, ceilings and landscaping should use a continuous treatment to provide a comfortable transition between undercrossing and approach areas and to facilitate orientation and wayfinding when approaching and passing through those spaces.
- **Urban trails**
  - Provide appropriate trail widths based on projected use.

See Appendix A for more information on Design Intent.

VIEW 3:
Montlake Undercrossing

Background and context

The undercrossing at Montlake Boulevard East enables a continuous shared-use path connection between the West Approach Bridge and the Bill Dawson Trail. On the east side of Montlake Boulevard East, a stairway connects the shared-use path to the bus stops and urban trailhead on the lid above. Feedback on the Preliminary Concept Design included concerns about sight lines, pedestrian safety and comfort, and potential user conflicts where the stairway meets the shared-use path.

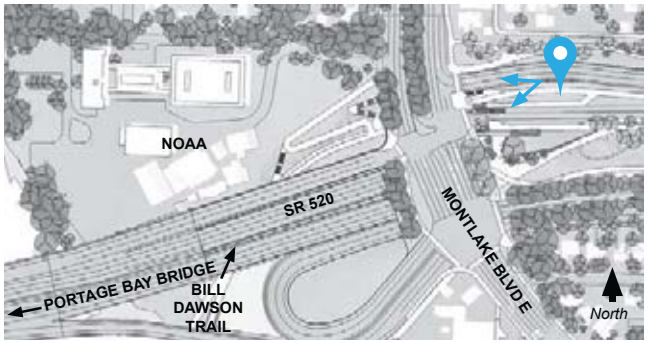
Design refinements

- Provide separate bicycle and pedestrian pathways within a 20-foot-wide passageway.
- The trail and passageway have been repositioned so that users can see through the undercrossing before entering it in accordance with CPTED principles of natural surveillance.
- Landings and transition spaces for stairs and ramps between the shared-use path and the roadway above have been enlarged.

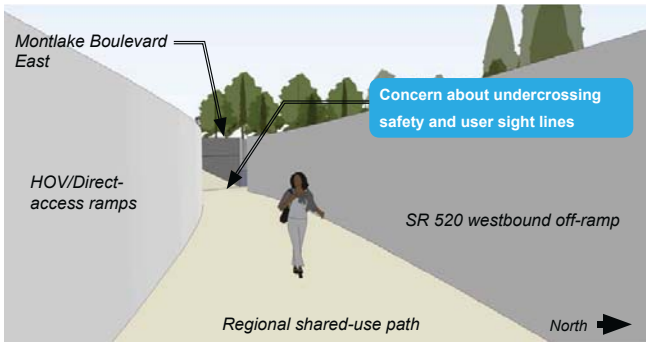
Design intent

- **Undercrossings**
  - The design of walls and landscaping should provide a comfortable transition between undercrossings and approach areas, facilitating orientation and wayfinding when approaching and passing through those spaces.
  - Walls and any associated landscape approaching the passageway should be sloped back wherever possible to maximize views and natural light.
- **Urban trails**
  - Provide appropriate trail widths based on projected use.

See Appendix A for more information on Design Intent.

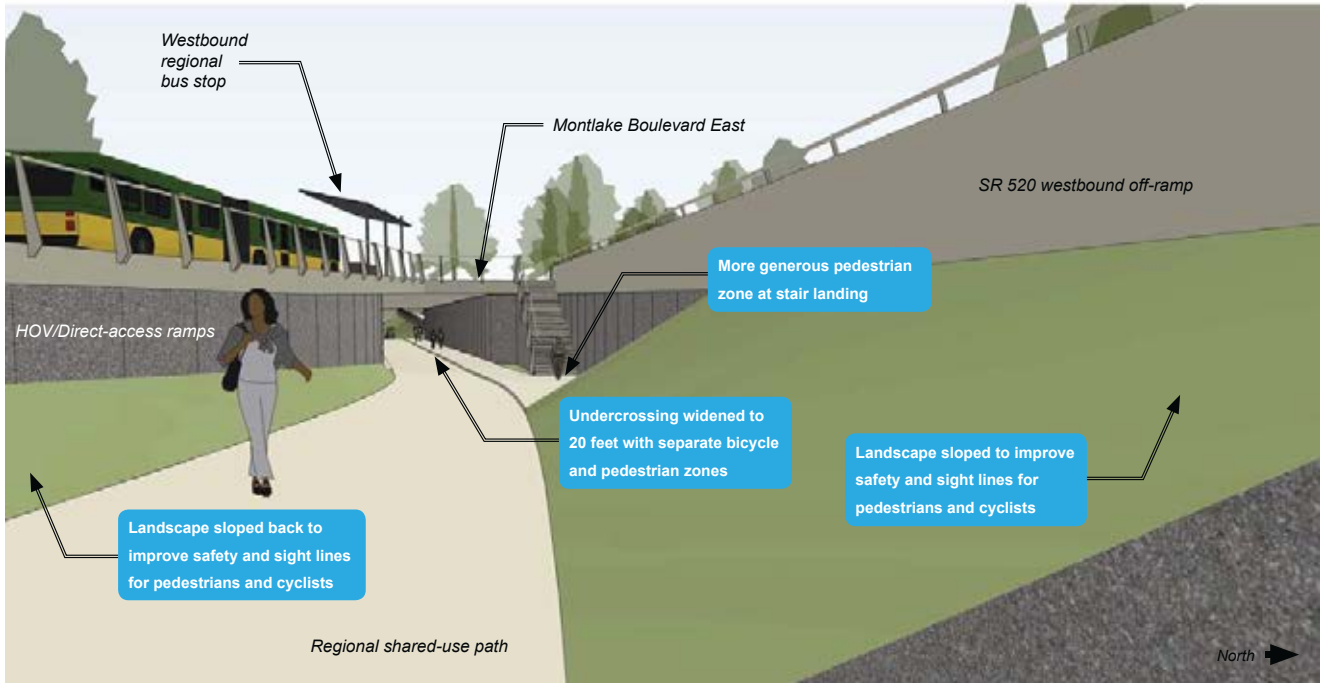


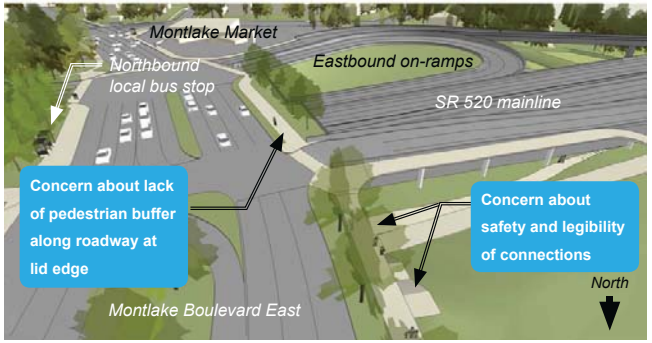
Location Key: *View west along shared-use path toward Montlake Boulevard East.*



Preliminary Concept Design

Final Concept Design





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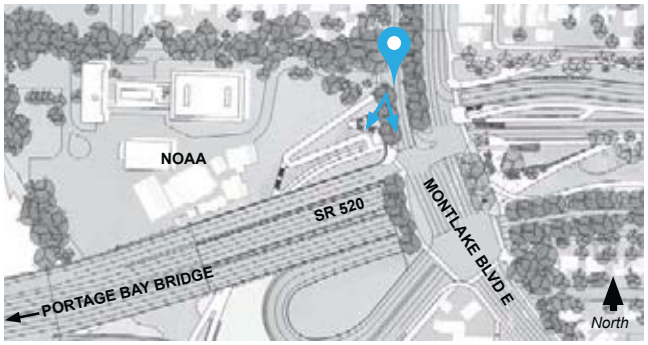
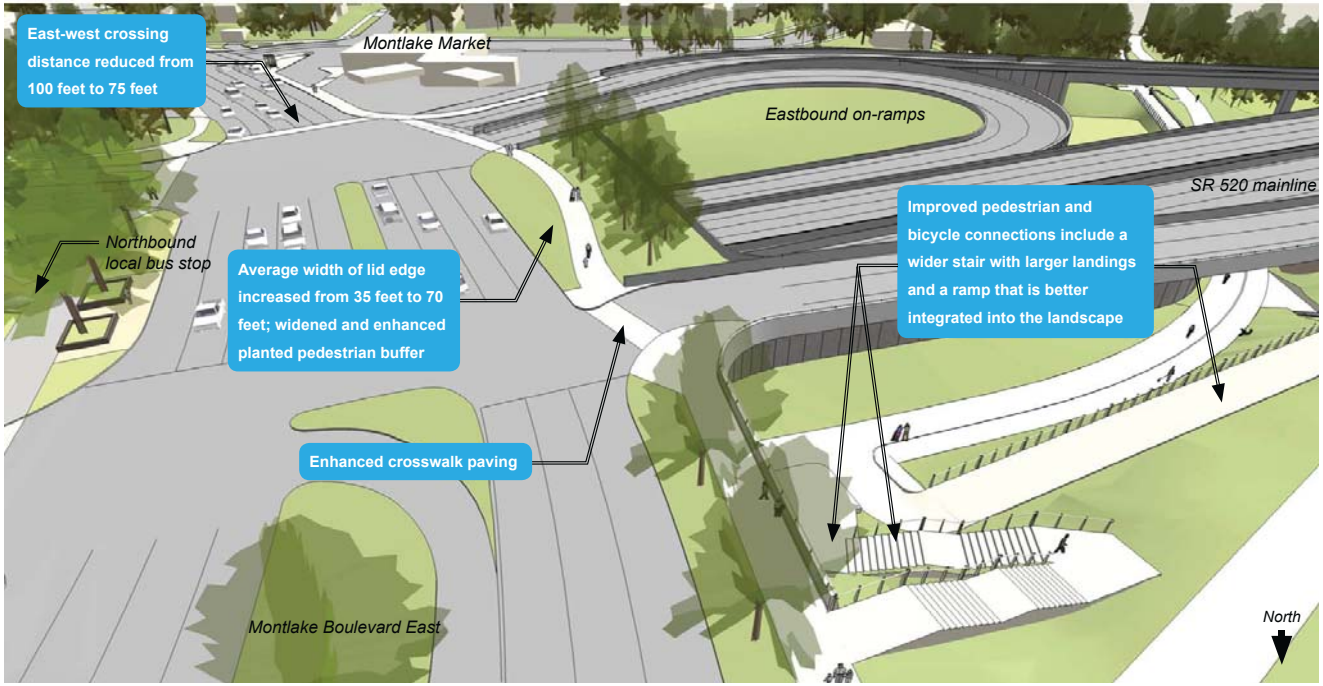


Location Key: *View facing south along Montlake Boulevard East.*

Final Concept Design



VIEW 4:
Montlake Lid - West Edge

Background and context

Currently, the sidewalk on the west side of Montlake Boulevard East is directly adjacent to the roadway with no buffer between pedestrians and traffic along this busy multimodal route. The Preliminary Concept Design proposed an extension of the lid to the west of Montlake Boulevard East to provide a buffer in this area. However, feedback indicated continued concern about safety, crossing distances, and a desire for larger buffers between the sidewalk and the roadway.

Design refinements

- The lid extends further west, increasing the width of the open space buffer adjacent to the roadway from 35 feet to 70 feet.
- A more significant buffer exists between the sidewalk and the roadway, providing better screening of SR 520 to the west.
- The east-west crossing distance of Montlake Boulevard East has been reduced from 100 feet to 75 feet.

Design intent

- **Sidewalks and crosswalks**
  - Design signal timing to allow for adequate crossing time for users of all ages and abilities, including those using mobility assistance devices.
  - Consider distinct pavement color (for roadway), materials, or durable markings at crosswalks that heighten driver and pedestrian awareness of crossings.
  - Provide vegetated buffers between sidewalks and roadways wherever possible.
- **Urban trails**
  - Provide vegetated buffers from adjacent roadways with barriers as necessary.

See Appendix A for more information on Design Intent.

VIEW 5:
Montlake Boulevard East

Background and context

Montlake Boulevard East, a busy corridor for all modes of travel, connects the SR 520 corridor to the University of Washington, the Burke-Gilman Trail, and the future University Link light rail station. The Preliminary Concept Design for the SR 520 project proposed a second bascule bridge across the Montlake Cut. Although this remains the project recommendation, alternative crossing options are currently being studied by the city of Seattle (see pp. 24-25).

Feedback on the Preliminary Concept Design suggested further improvements needed for pedestrian and cyclist safety and experience in the Montlake corridor.

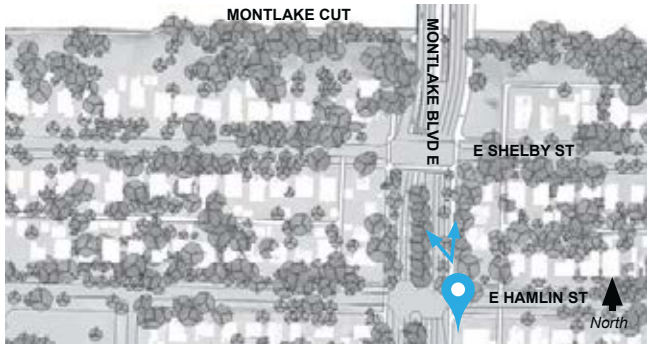
Design refinements

- Pedestrian crossing improvements on both sides of East Montlake Boulevard, such as raised crosswalks at East Shelby and East Hamlin Streets, improve safety and legibility.
- A counterflow bicycle lane on East Shelby Street will provide cyclists with an alternative to riding on Montlake Boulevard East.
- See diagram on p. 55 for additional pedestrian improvements further south on Montlake Boulevard East.

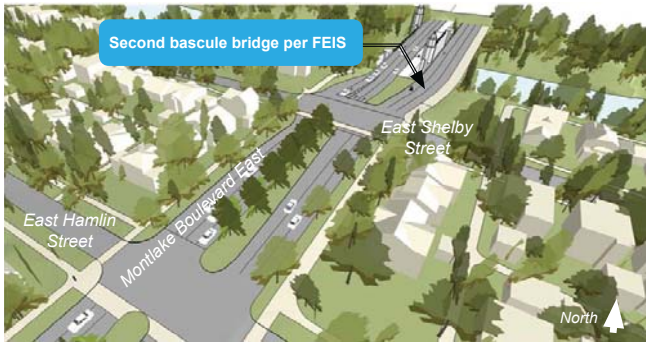
Design intent

- **Sidewalks and crosswalks**
  - Use consistent pavement material on north-south crosswalks.
- **Urban Trails**
  - Provide a facility along the east side of Montlake Boulevard East that will accommodate current and projected volumes of bicyclists and pedestrians at an acceptable level of service.

See Appendix A for more information on Design Intent.

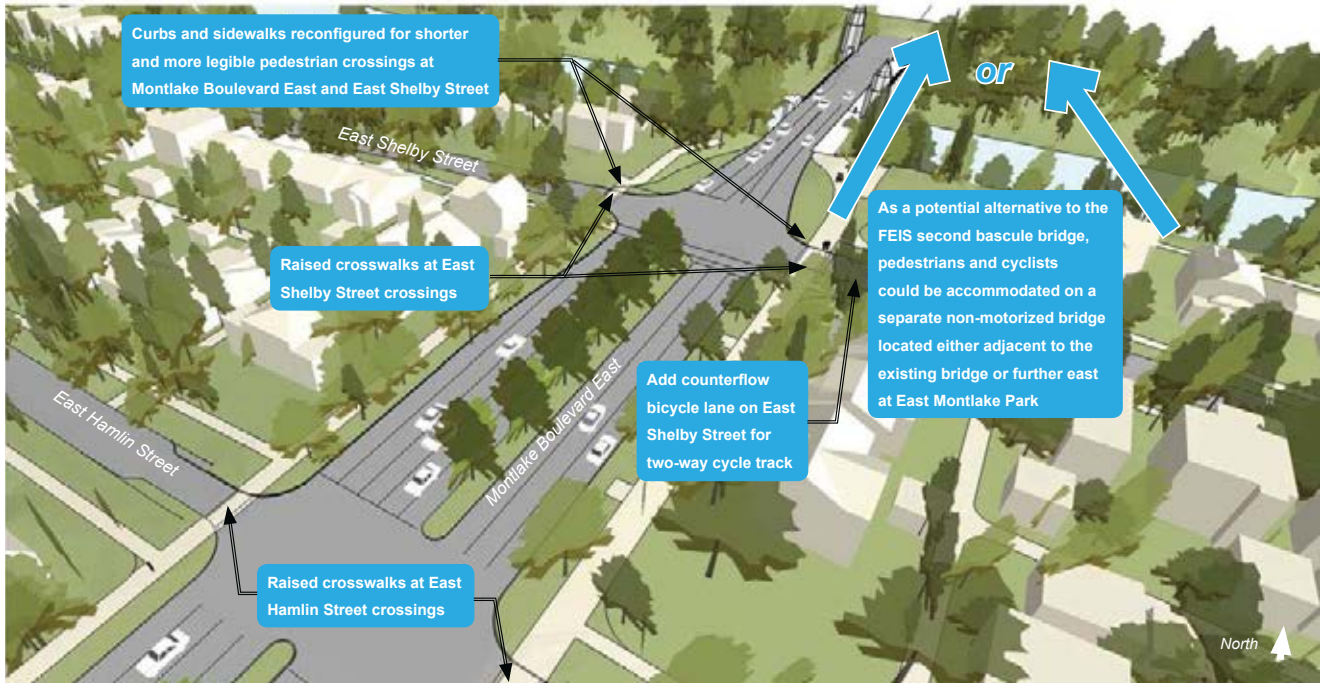


Location Key: *View northwest toward the Montlake Cut.*



Preliminary Concept Design

Final Concept Design



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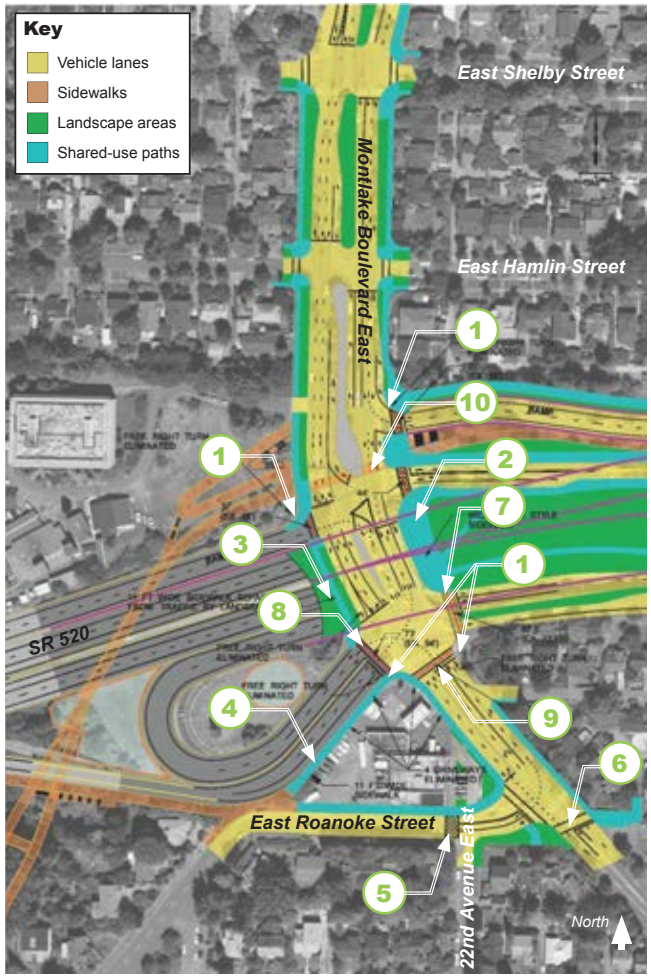
Existing Conditions: *Montlake Boulevard East at SR 520 interchange.*



Final Concept Design: *Montlake Boulevard East at SR 520 interchange.*

Pedestrian improvements on Montlake Boulevard East

In response to feedback received from community stakeholders, the project team worked to improve at-grade conditions for pedestrians moving across and along Montlake Boulevard East. Particular focus was given to the crosswalks and sidewalks at the SR 520 interchange. Specific improvements to the pedestrian realm include the following:

1. Free right turns eliminated at on- and off-ramps.
2. A wide, plaza-style sidewalk defines the urban trailhead and mobility hub on the lid.
3. A 14-foot-wide sidewalk on the west side of Montlake Boulevard East is separated from traffic by a landscaped buffer.
4. Addition of an 11-foot-wide sidewalk connecting the Portage Bay Bridge shared-use path to East Roanoke Street and Montlake Boulevard East.
5. Sidewalk on the north side of East Roanoke Street widened to 14 feet between Portage Bay Bridge shared-use path connection and East Montlake Place East; crosswalk improvements at 22nd Avenue East.
6. Intersection realignment and crossing improvements at the intersection of East Roanoke Street and East Montlake Place East provide safer, more direct connections along the greenways route.
7. North-south crossing distance at East Lake Washington Boulevard and Montlake Boulevard East reduced from 72.5 feet to 67.5 feet.
8. North-south crossing distance at eastbound on- and off-ramps and Montlake Boulevard East reduced from 94 feet to 73 feet.
9. East-west crossing distance at East Lake Washington Boulevard and Montlake Boulevard East reduced from 117 feet to 73 feet.
10. Pedestrian and bicycle undercrossing north of interchange allows continuation of regional shared-use path across Montlake Boulevard East.

VIEW 6:
Urban Trailhead

Background and context

The lid will create new open space along Montlake Boulevard East. Feedback on the Preliminary Concept Design expressed concern about lack of programming and the dominance of the four 20-foot-tall, 30-foot-wide emergency ventilation stacks in what could otherwise be a vibrant, activated gathering place.

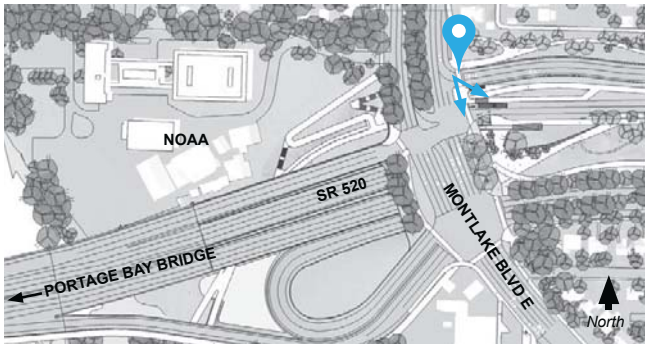
Design refinements

- The west edge of the lid area has been reenvisioned as an urban trailhead with a program focused on movement and discovery at the confluence of bus stops, a bike share station and the regional shared-use path network.
- Removal of ventilation stacks creates more useable open space and better visual and physical connections across SR 520.
- Continuous paving materials at crosswalks for safer crossings.
- Bicycle and pedestrian pathway on the lid connects Montlake Boulevard East to the Arboretum along the historic alignment of East Lake Washington Boulevard.
- Sidewalk and crossing distance improvements for safer, more direct routes between and among local and regional bus stops.

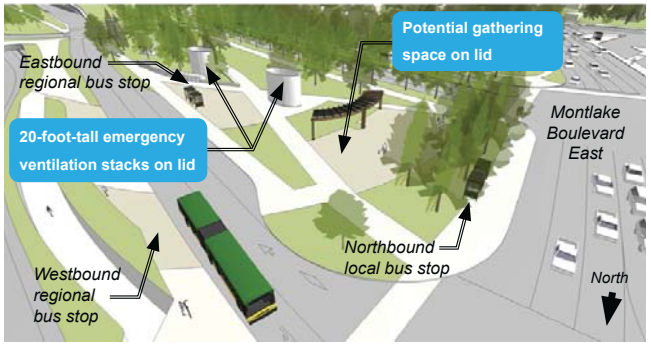
Design intent

- **Sidewalks and crosswalks**
  - Provide facilities along both sides of Montlake Boulevard East that will accommodate current and projected volumes of bicyclists and pedestrians at an acceptable level of service.
- **Gathering places**
  - Provide seating opportunities at gathering places; allow for people sitting alone or in groups.

See Appendix A for more information on Design Intent.



Location Key: *View facing southeast toward the west lid area.*



Preliminary Concept Design

Final Concept Design

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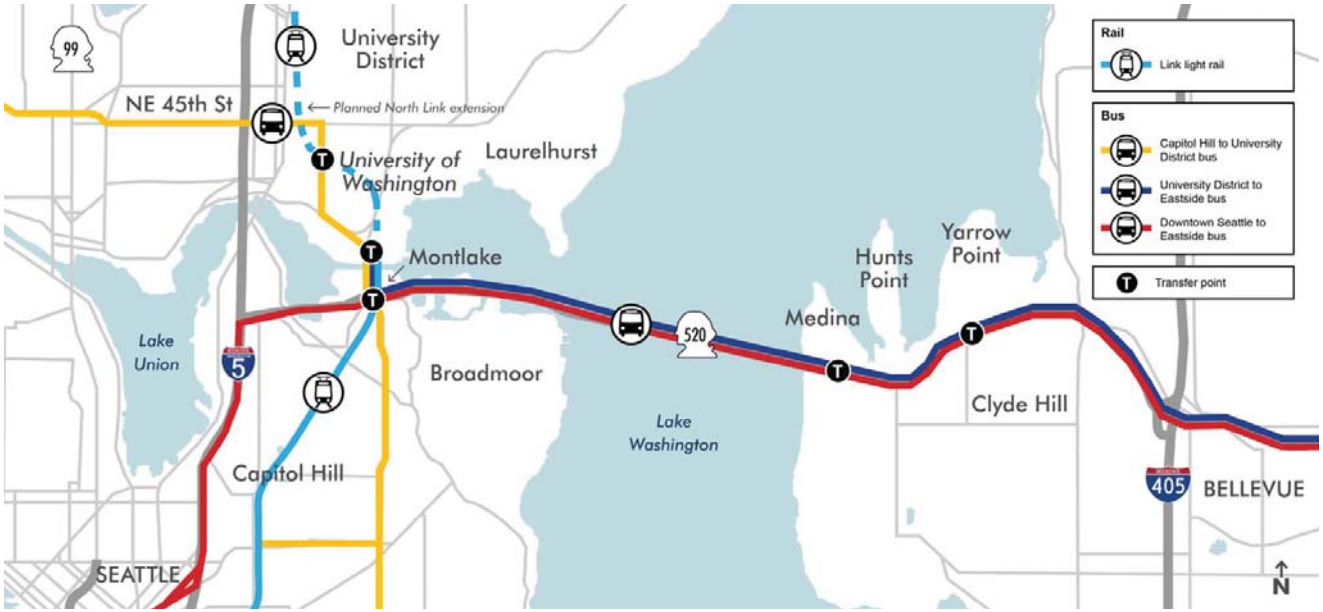
City of Seattle



Future transit operations in the SR 520 corridor.

SR 520 transit operations improvements

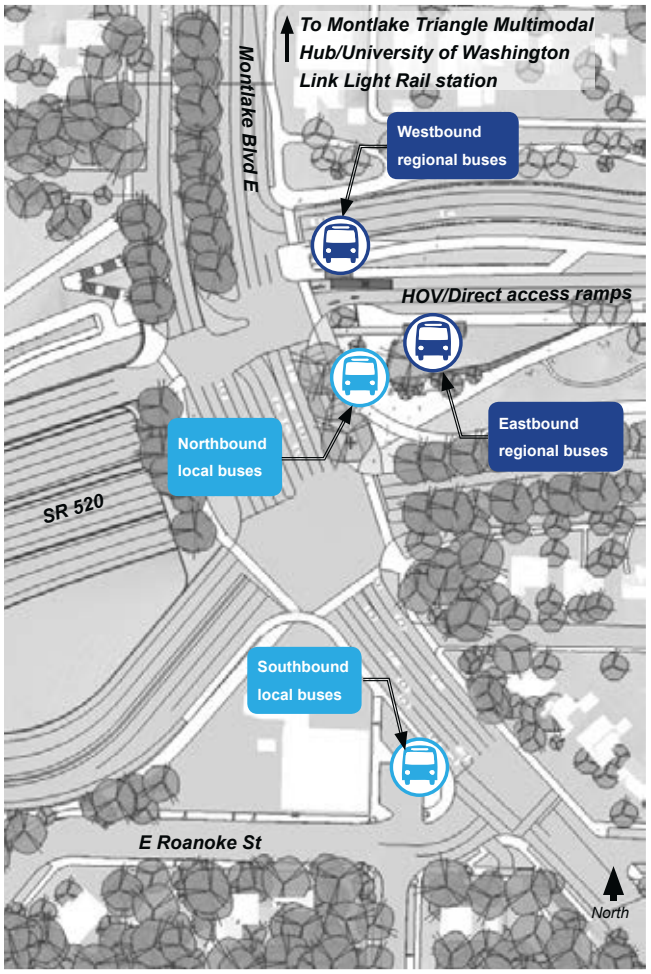
The SR 520 project includes infrastructure that will support regional transit plans developed by King County Metro and Sound Transit. The current highway design will help connect transit riders to destinations throughout the region, including downtown Seattle, the University of Washington, Capitol Hill and communities on the Eastside. The new SR 520 will improve transit operations in the following ways:

- More reliable trips for buses with direct-access ramps on and off the highway.
- Safer, easier connections for pedestrians and bicyclists on paths connecting bus stops, wider and better-signalized crosswalks, and local service bus stops near regional bus stops.
- Better operations in Montlake with transit/HOV lanes on Montlake Boulevard East, local and regional bus stops on a new Montlake lid, and opportunities for transit signal priority.

Future transit operations on the Montlake lid

The Montlake Freeway Transit Station has been relocated to the top of the new Montlake lid. This will change future transit operations in the following ways:

- ***Downtown Seattle to Eastside:*** During peak hours, buses will not stop at the Montlake lid, providing more direct service. During off-peak hours, transit agencies could operate buses on top of the Montlake lid, providing service similar to today.
- ***Capitol Hill to the Eastside:*** Riders will have a short walk from a new local bus stop to regional bus stops on the Montlake lid at all hours.
- ***Capitol Hill to downtown Seattle:*** Riders can ride Link light rail or local buses.



Final Concept Design: *Transit stops at the SR 520 interchange on Montlake Boulevard East.*

VIEW 7:
Montlake Lid

Background and context

The new open space created by the Montlake lid has the potential to provide new community connections. In the Preliminary Concept Design, the west lid was dominated by four 20-foot-tall, 30-foot-wide emergency ventilation stacks that affected the character of the space and blocked views across the corridor.

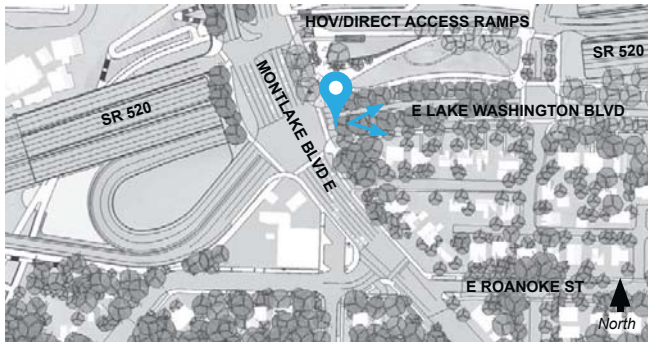
Design refinements

- Ventilation stacks have been removed, improving both views and security on the lid.
- The west lid area has been reenvisioned as an urban trailhead, providing an activated entry point to the Washington Park Arboretum and serving connections to East Montlake Park and the Lake Washington shoreline.

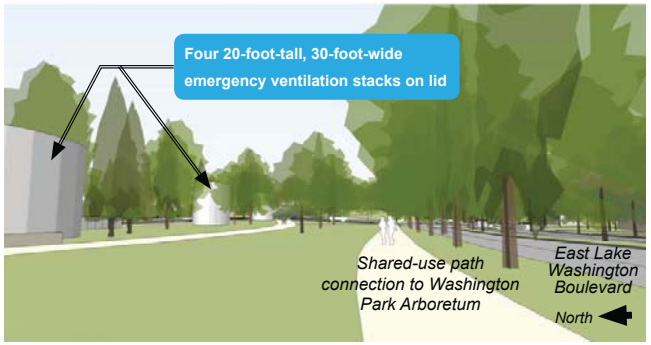
Design intent

- **Urban trails**
  - Provide vegetated buffers from adjacent roadways with barriers as necessary.
- **Community character**
  - Ensure that the design of the Montlake Boulevard East planted areas across the lid reflect the historical connection between Montlake Boulevard East and East Lake Washington Boulevard. These planted areas should reflect the original design principles of East Lake Washington Boulevard and other Olmsted-designed boulevards in Seattle to the degree possible. The design of this area should respect the history of the boulevard while reconnecting ecological systems and responding to current community needs.

See Appendix A for more information on Design Intent.



Location Key: *View facing east of the west lid area.*



Preliminary Concept Design

Final Concept Design

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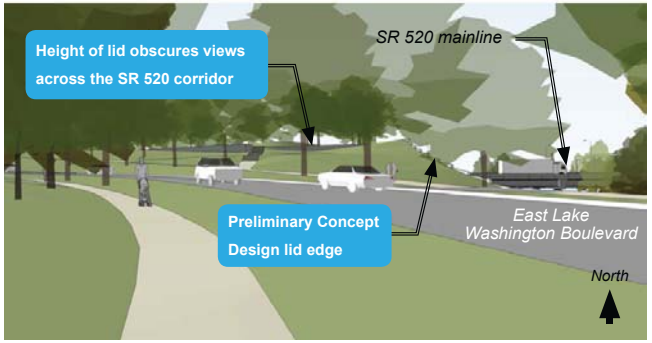
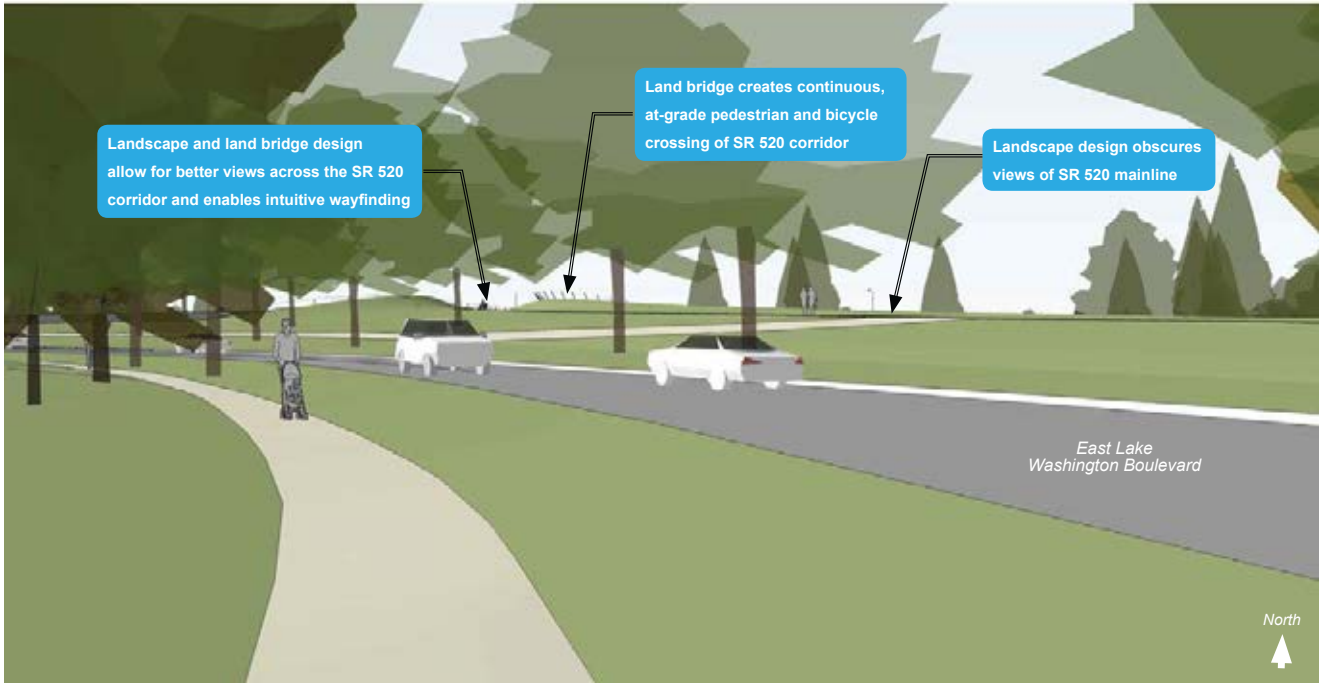


Preliminary Concept Design

Location Key: *View facing north along East Lake Washington Boulevard.*

Final Concept Design



VIEW 8: Arboretum North Entry

Background and context

The tall, box-like form of the Preliminary Concept Design lid did not provide a continuous north-south connection across the entire lid and introduced an imposing concrete structure at the shoreline. Public response to this design expressed concern about the visual character of the lid walls and the visibility of the SR 520 facility from adjacent areas. Stakeholders also expressed a desire for a complete and accessible pedestrian and bicycle connection across the lid.

Design refinements

- Landscape forms screen views of the SR 520 roadway and extend this visual buffer further south along East Lake Washington Boulevard.
- A lower land bridge profile allows for views across SR 520, completing visual and physical connections across the lid.
- Landscape forms provide continuous Arboretum character along East Lake Washington Boulevard.

Design intent

- **Community character**
  - Create a landscape design plan for the Montlake lid that is compatible with the character of the Montlake Historic District. This plan will include plantings and urban design elements, possibly including median and planter strip design, interpretive signage, and bus shelter design.

See Appendix A for more information on Design Intent.

VIEW 9:

East Lake Washington Boulevard

Background and context

The interface between the SR 520 project and the historic boulevard at the Washington Park Arboretum presents an opportunity to express the Olmsted legacy as an urban system of green connections that supports a healthy community. The Preliminary Concept Design proposed a built-up lid structure at this location that did not express a continuous landscape connection along this important project edge.

Design refinements

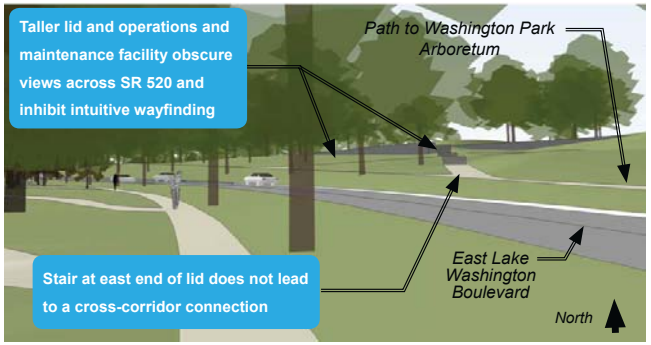
- The landscape expression extends the visual and physical buffers of the highway from adjacent areas while increasing the visibility of the sky and landscape beyond SR 520.
- Landscape forms provide continuity between the Washington Park Arboretum and adjacent parks and open spaces.

Design intent

- **Sidewalks and crosswalks**
  - Provide vegetated buffers from adjacent roadways.
- **Land bridge**
  - Shape the bridge form to defer to and directly integrate with the curved, non-orthogonal lines of the surrounding natural environment.
- **Community character**
  - Create a landscape design plan for the Montlake lid that is compatible with the character of the Montlake Historic District. This plan will include plantings and urban design elements, possibly including median and planter strip design, interpretive signage, and bus shelter design.

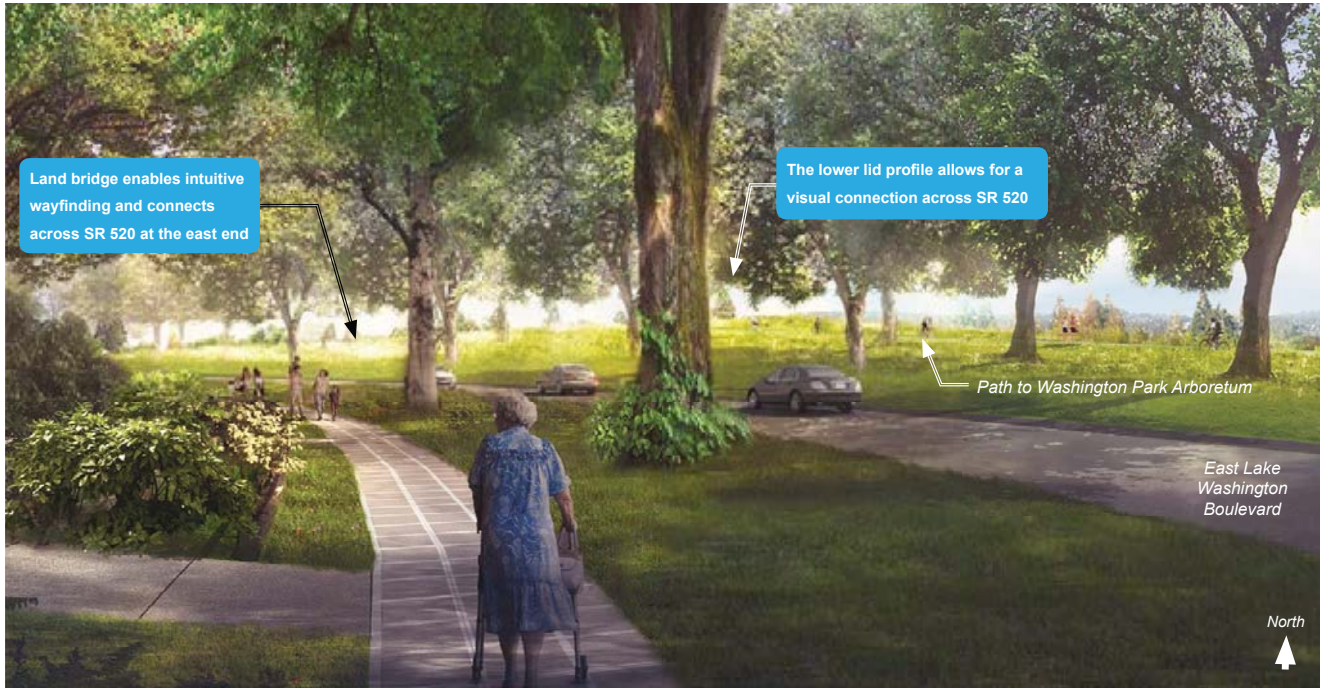
See Appendix A for more information on Design Intent.

Location Key: *View facing north along East Lake Washington Boulevard.*



Preliminary Concept Design

Final Concept Design



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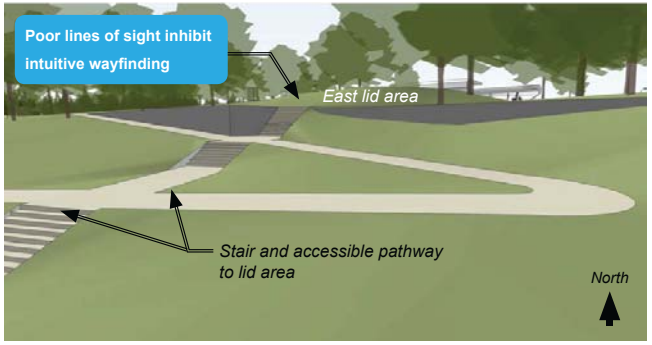
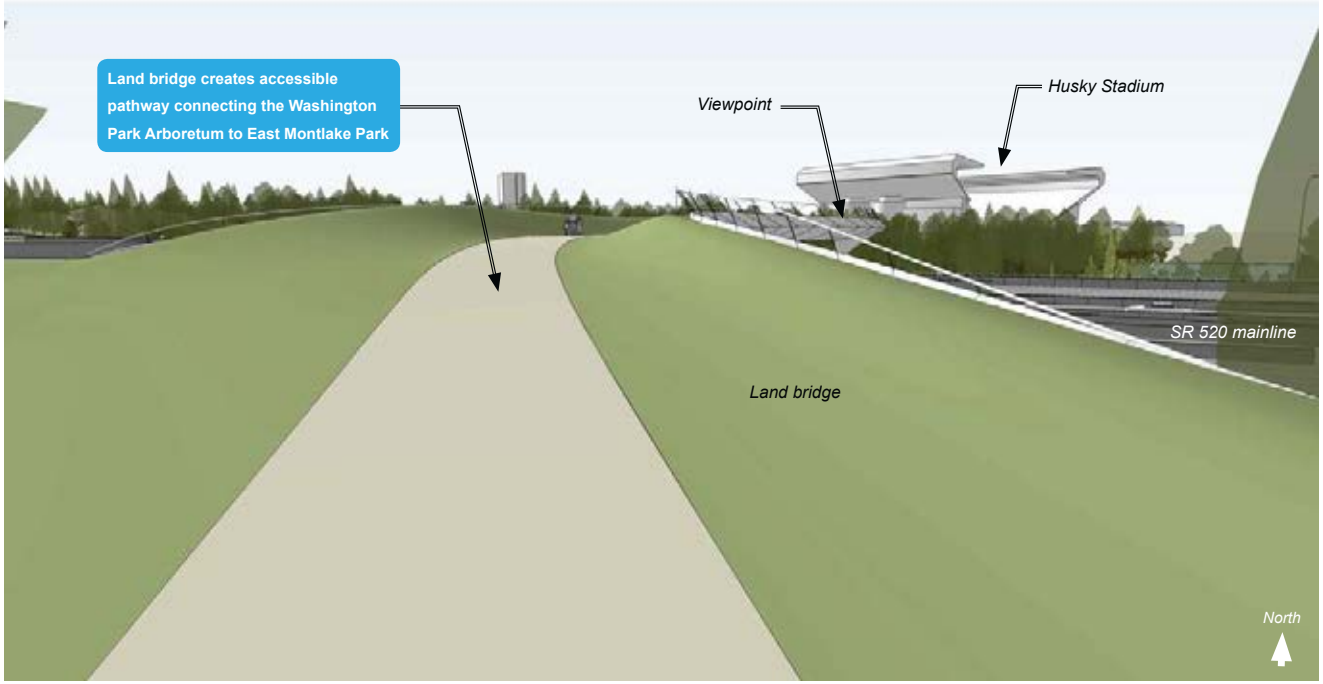


Preliminary Concept Design

Location Key: *View facing north at the southern approach to the land bridge.*

Final Concept Design



VIEW 10: Land Bridge Approach

Background and context

The Preliminary Concept Design did not provide direct pedestrian or bicycle access over and across the lid. A circuitous path composed of stairs and switchbacks led to open space and a viewpoint at the highest point of the lid. Approaching the lid from the Washington Park Arboretum to the south, it was not possible to see across the corridor or to understand where the pathway onto the lid would ultimately lead.

Design refinements

- The land bridge provides a continuous regional connection across (and over) the SR 520 corridor.
- The visibility of the land bridge allows for intuitive wayfinding and provides an enhanced sense of security for pedestrians and cyclists in accordance with CPTED principles of natural surveillance.
- The land bridge trail is less than five percent grade, encouraging users of all ages and abilities to make the north-south crossing between the Arboretum and East Montlake Park.

Design intent

- **Land bridge**
  - Provide an approximately 30-foot-wide landscaping area, shaped and planted adequately to visually buffer the path user from awareness of the large expanse of highway below.
  - Ensure the landscape cross-section provides a comforting sense of enclosure against the noise and view of the roadway while maintaining clear lines of sight along the path.
- **Vegetation**
  - Consider ease of maintenance when selecting plant species and designing plantings.

See Appendix A for more information on Design Intent.

VIEW 11:
Land Bridge

Background and context

In the Preliminary Concept Design, the only north-south connection across the SR 520 corridor consisted of a shared-use path that crossed under 280 feet of roadway at the shoreline. The height and configuration of the lid structure did not allow for an accessible pedestrian and bicycle connection over the freeway. Significant feedback was received regarding the desire for a better north-south travel option for cyclists and pedestrians.

Design refinements

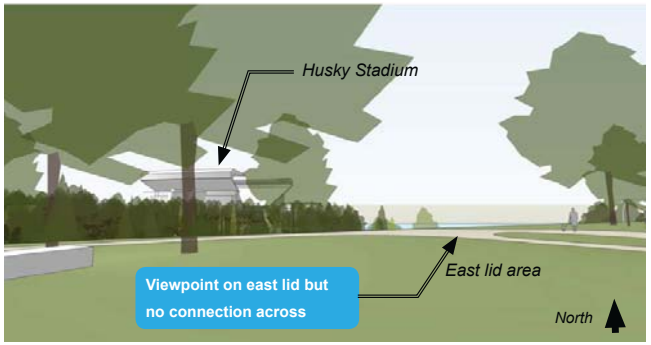
- The gently-sloped land bridge creates a better regional connection, extending multifunctional open space across SR 520.
- The visibility of the land bridge increases the potential for intuitive wayfinding, enhances user security, and includes viewpoints and pause places in visible locations.
- The land bridge vegetation complements the University of Washington Botanic Gardens (UWBG) collections and helps to reconnect the UWBG facility.

Design intent

- **Land bridge**
  - Create a special viewpoint at the north trail bend directly above the shared-use path on the West Approach Bridge. This will provide views of Union Bay, Husky Stadium, Lake Washington and northeast Seattle.
  - The viewpoint may also offer interpretive opportunities about the sustainable stormwater treatment facility directly below.
  - The viewpoint should be designed as an extension of the pedestrian and bicycle pathway and consider best practices for "mixing zones" on shared-use paths.

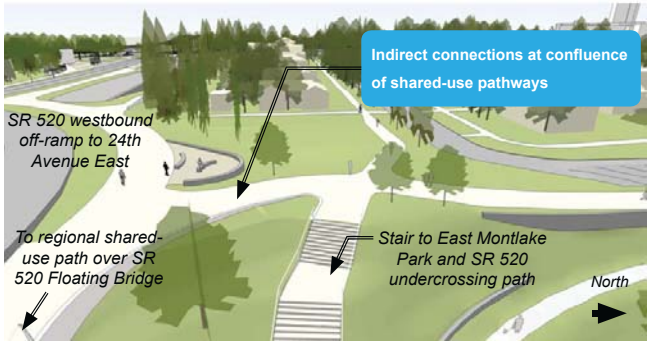
See Appendix A for more information on Design Intent.

Location Key: *View along the land bridge facing north.*



Preliminary Concept Design

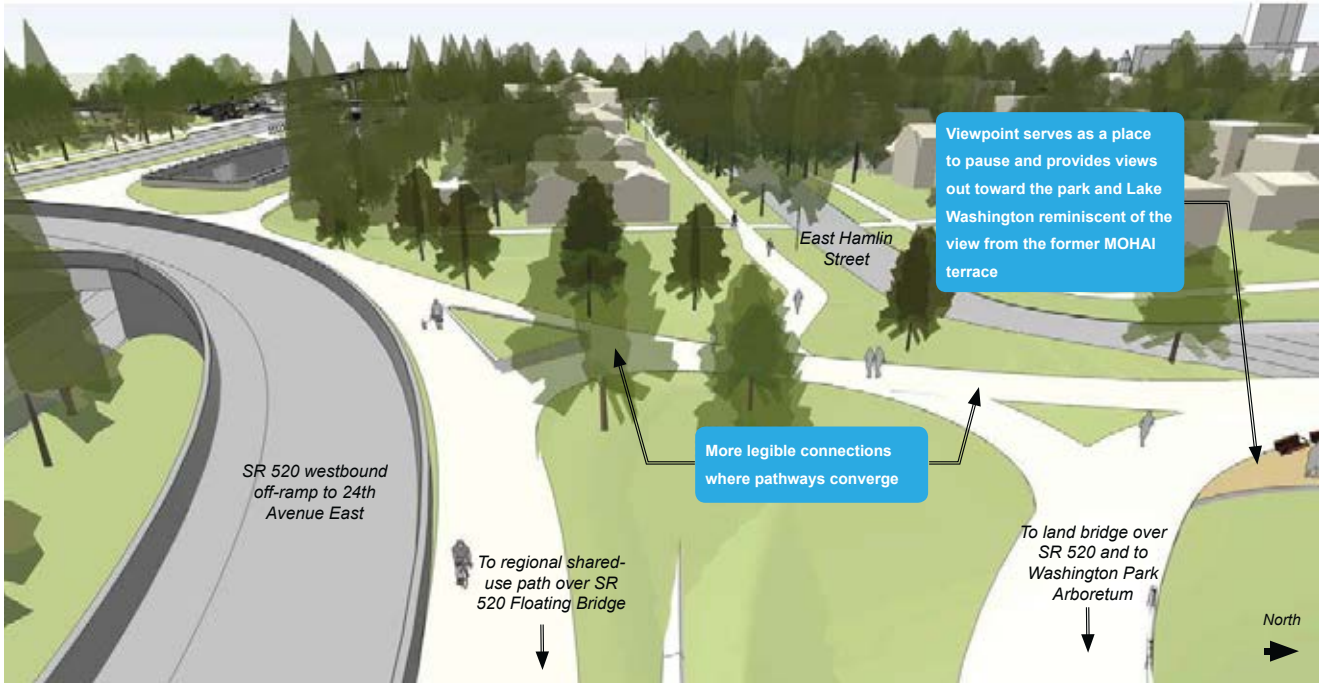
Final Concept Design



Preliminary Concept Design

Location Key: *View facing west toward the Shelby/Hamlin neighborhood.*

Final Concept Design



VIEW 12:
Shelby/Hamlin Area

Background and context

The area where the east-west regional shared-use path connects north to East Montlake Park is an important point of convergence. A viewpoint at this location that references the previous location of the Museum of History and Industry (MOHAI) on the site provides an overview of East Montlake Park.

Design refinements

- The land bridge provides additional regional connections.
- The meeting of the north-south and east-west regional pathways activates the area and marks it as a place to pause and enjoy views over East Montlake Park.
- Pathway connections are reconfigured to provide more legible routes for users travelling to and through the area.

Design intent

- **Urban trails**
  - Keep site furnishings, vegetation, or other obstructions clear of sidewalks and paths.
  - Provide vegetated buffers from adjacent roadways with barriers as necessary.
- **Gathering places**
  - Provide sidewalk and trail users with spaces of adequate size to pull off or step out of circulation areas to avoid impeding the passage of other users.
  - Provide seating opportunities at gathering places; allow for people sitting alone or in groups.
  - At viewpoints, coordinate with vegetation design to avoid planting vegetation that will grow in to block key views.

See Appendix A for more information on Design Intent.

VIEW 13:
Shelby/Hamlin Area

Background and context

The project area meets East Montlake Park where the east-west regional shared-use path meets the north-south regional connection of the land bridge. A viewpoint provides an overview of the park and Lake Washington. Feedback on the Preliminary Concept Design in this area was focused on the effect of the lid walls on the user experience of the park.

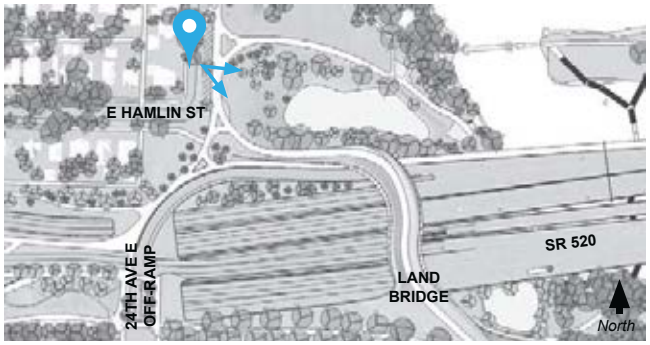
Design refinements

- The lid has been reconfigured to be less massive near the shoreline.
- The land bridge connection introduces a connective, human-scaled element at the project edge near East Montlake Park.
- Views of the freeway remain buffered and views of the lid wall are reduced, resulting in more useable open space.
- The land bridge improves regional connectivity, encouraging positive activity in all seasons.

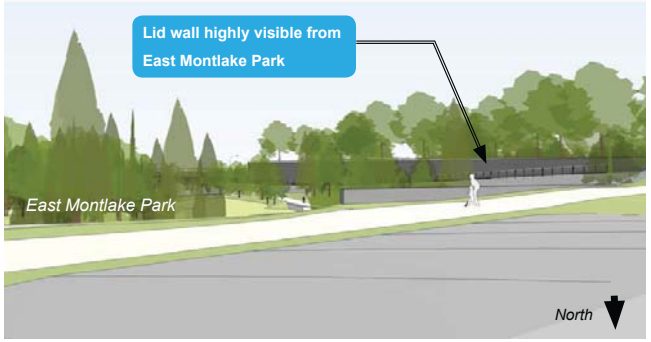
Design intent

- **Urban trails**
  - Keep site furnishings, vegetation, or other obstructions clear of sidewalks and paths.
- **Stormwater**
  - Distribute treatment areas for the West Approach Bridge North, West Approach Bridge South, and Montlake lid to utilize areas available to both the north and south of SR 520.

See Appendix A for more information on Design Intent.

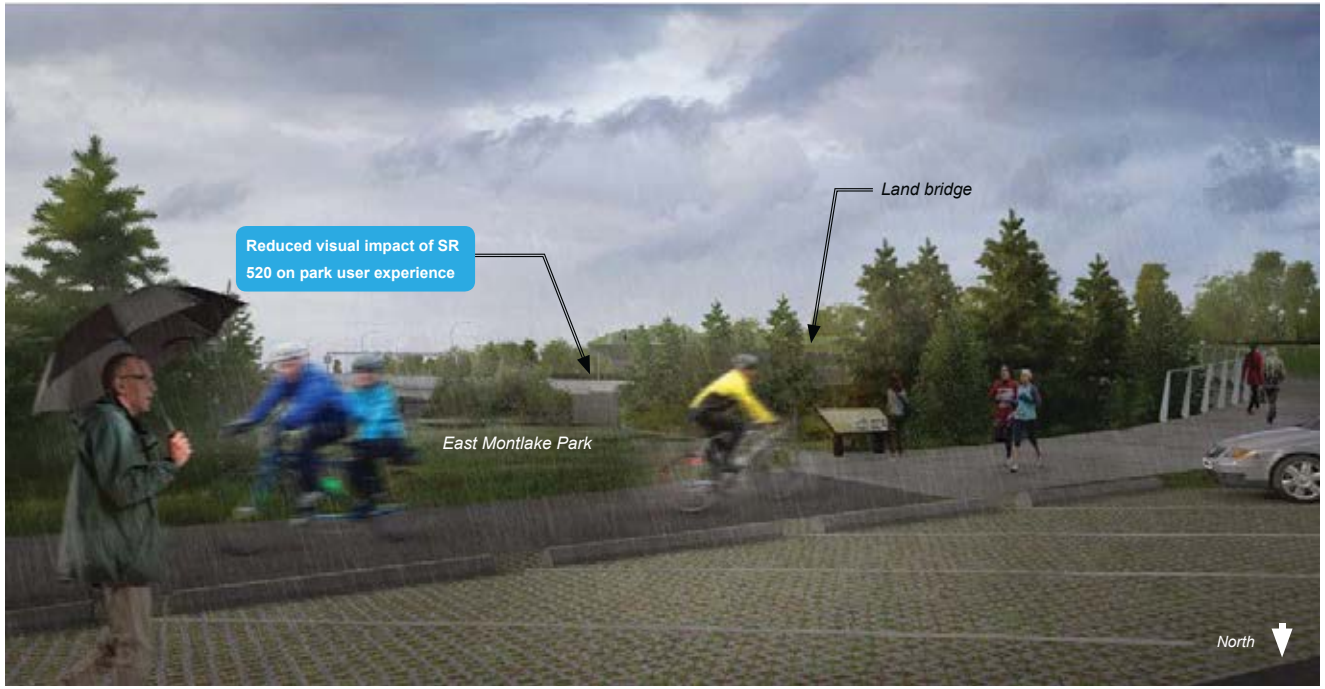


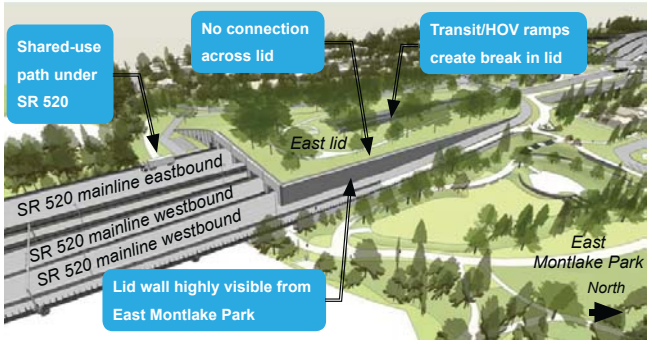
Location Key: *View facing west along West Approach Bridge regional shared-use path.*



Preliminary Concept Design

Final Concept Design





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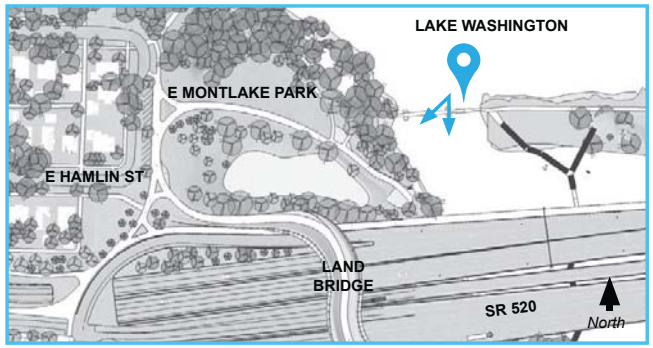
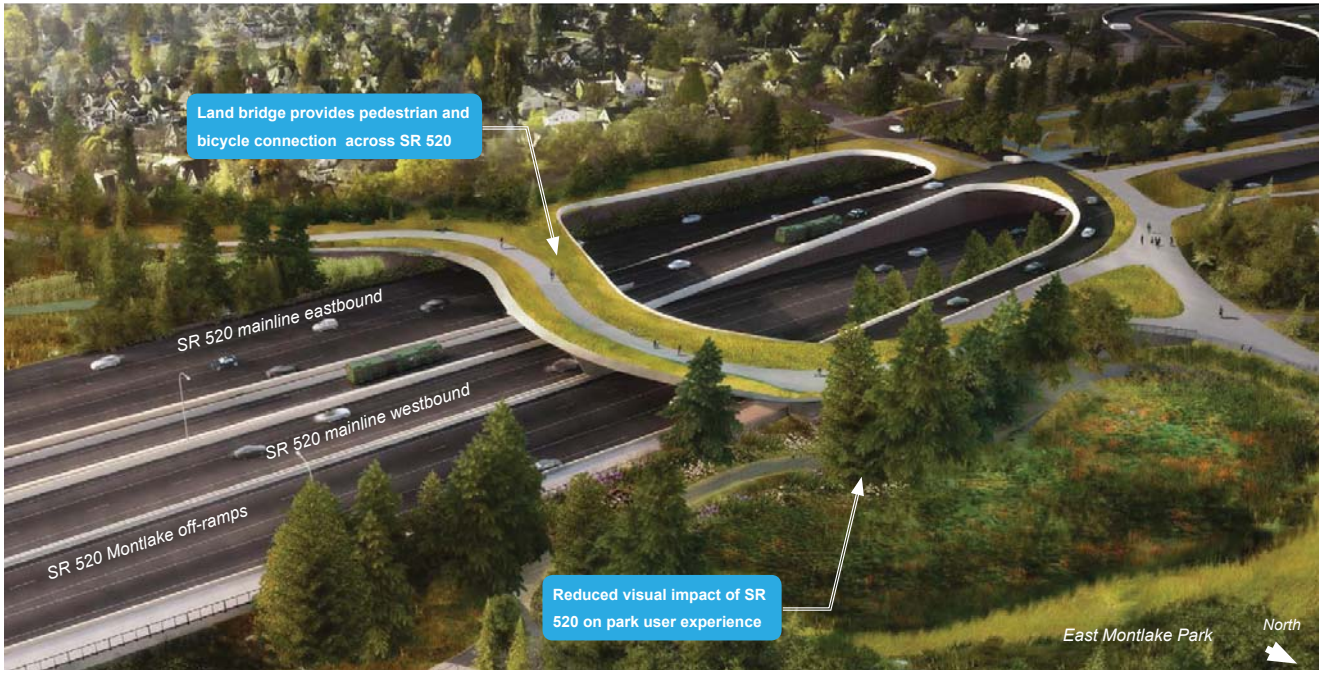


Location Key: *Bird's-eye view facing southwest toward land bridge and east lid area.*

Final Concept Design



VIEW 14: Land Bridge

Background and context

In the Preliminary Concept Design, the principal north-south regional connection across the SR 520 corridor was located beneath 280 feet of roadway along the Lake Washington shoreline. The public expressed concern about the safety, experience, and utility of this configuration.

Design refinements

- The land bridge creates a better regional connection from the Arboretum to East Montlake Park and beyond.
- Replacing the east end of the lid with the more functional land bridge results in a 30 percent reduction in concrete, steel and other construction materials needed for the lid.
- The elevation of the land bridge is approximately 15 feet lower than the Preliminary Concept Design, making a five percent grade connection across SR 520 possible.

Design intent

- **Land bridge**
  - Shape the bridge form to defer to and directly integrate with the curved, non-orthogonal lines of the surrounding natural environment.
  - Provide a north-south non-motorized connection with buffered views of the highway.
- **Stormwater**
  - Maintain a saturated wetland condition in treatment wetlands for the majority of the year to support wetland habitat.
- **Community character**
  - Ensure that the landscape design plan for the land bridge continues the character of the Arboretum across SR 520.

See Appendix A for more information on Design Intent.

VIEW 15:
North Stormwater Area

Background and context

Where SR 520 meets land, the northern edge of the project borders East Montlake Park, a local park adjacent to the Shelby/Hamlin neighborhood. In the Preliminary Concept Design, the wall of the east lid area was highly visible from the park and the public expressed concern about the scale and expression of this part of the project.

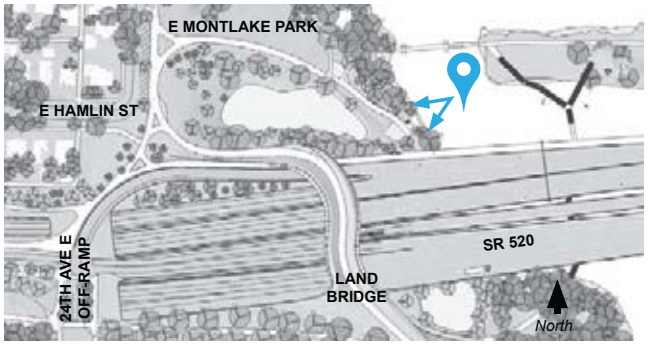
Design refinements

- Views of the freeway from the park remain buffered and the lid wall is reduced in scale, lessening its visual impact on adjacent areas.
- The new land bridge provides an overlook toward Lake Washington and over East Montlake Park.
- The refined lid design and new land bridge introduce human-scaled elements that have a better relationship to the park.

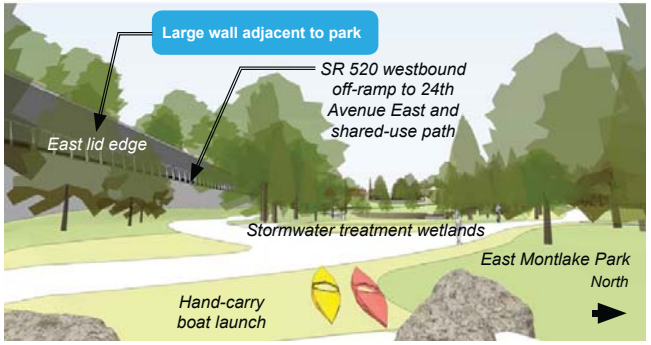
Design intent

- **Stormwater**
  - Separate stormwater runoff from non-pollution-generating areas to limit facility size.
  - Cover the pre-settling cell in East Montlake Park (north of SR 520) in a vault to increase the area available for other landscape elements to ease the grade transition and better integrate the treatment facility into the landscape.
- **Vegetation**
  - Select plants that integrate into the context of the park and provide enhanced treatment to provide increased ecological benefit and integrate into the shoreline ecology.
- **Community character**
  - Minimize the visual impact of SR 520 on East Montlake Park.

See Appendix A for more information on Design Intent.

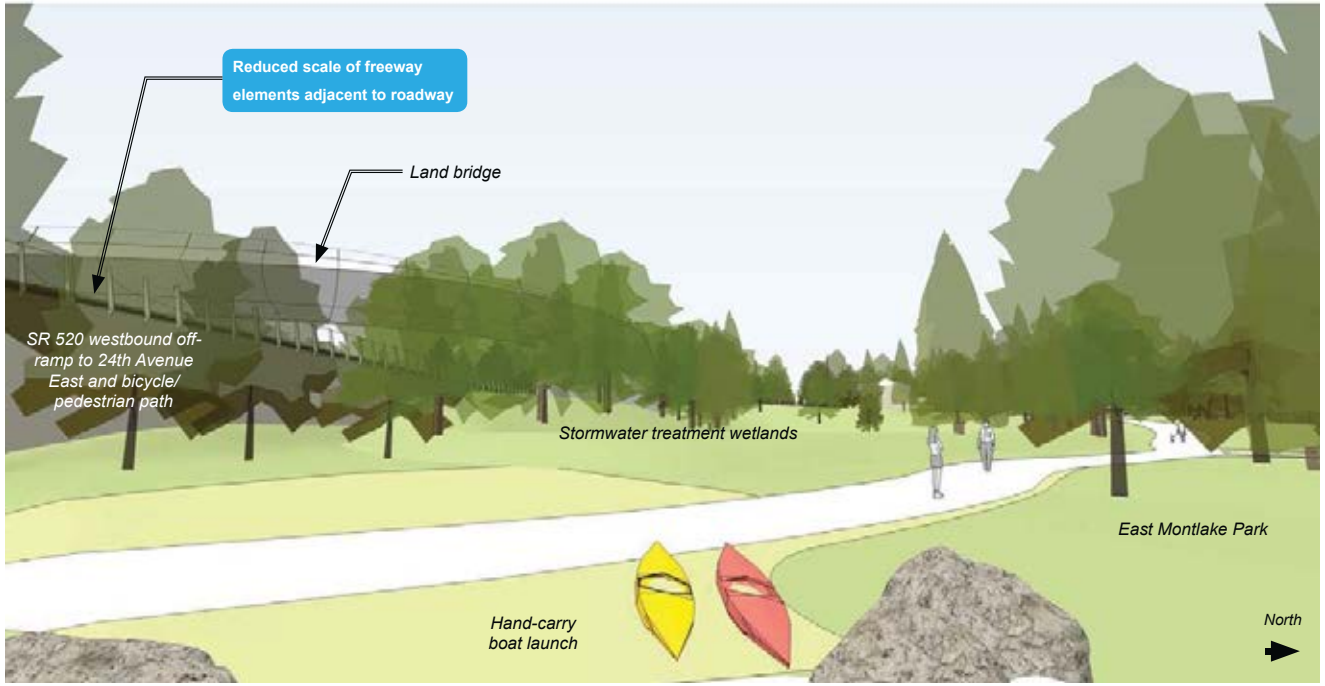


Location Key: *View facing west toward hand-carry boat launch and East Montlake Park.*



Preliminary Concept Design

Final Concept Design



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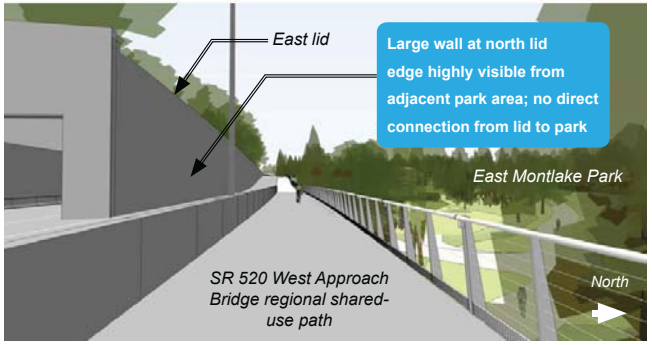
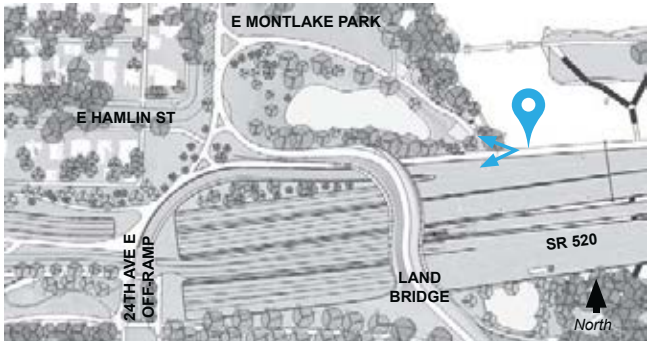


Preliminary Concept Design



Location Key: *View facing west along the West Approach Bridge shared-use path.*

Final Concept Design

VIEW 16: West Approach Bridge Path

Background and context

SR 520 transitions from bridge to highway where the West Approach Bridge meets the Lake Washington shoreline. This threshold between land and water marks an entry point into the natural area defined by the Washington Park Arboretum and East Montlake Park. Feedback regarding this threshold reinforced the importance of the expression of the layered gateway and highlighted the need to ensure that project elements adjacent to park areas are scaled for the human experience.

Design refinements

- The layered sequence of the land bridge and the lid achieve a better expression of land/water thresholds where "Nature meets City."
- The roadway experience has better visual connections to the surrounding shoreline landscape.
- Walls next to East Montlake Park have been reduced in scale.

Design intent

- **Urban trails**
  - Provide appropriate trail widths based on projected use and guidance from appropriate current standards.
  - Provide vegetated buffers from adjacent roadways with barriers as necessary.

See Appendix A for more information on Design Intent.

Note: Forms of land bridge piers as illustrated may evolve to meet site-specific engineering requirements.

VIEW 17:
East Lid Gateway

Background and context

The threshold of the Montlake lid at the Lake Washington shoreline marks the place where drivers transition between the natural area of the lake and the Washington Park Arboretum to the urban environment of Seattle, a gateway between Nature and City. The tunnel-like expression of the east lid portal in the Preliminary Concept Design did not embody the layered experience of these overlapping environments.

Design refinements

- The layered gateway experience of sequential portals and vertical interaction creates a better expression of "Nature meets City."
- Drivers heading westbound experience nature/city thresholds at the land bridge and then at the lid portal further west.
- The roadway experience is better connected to the surrounding landscape with more room for trees adjacent to travel lanes.

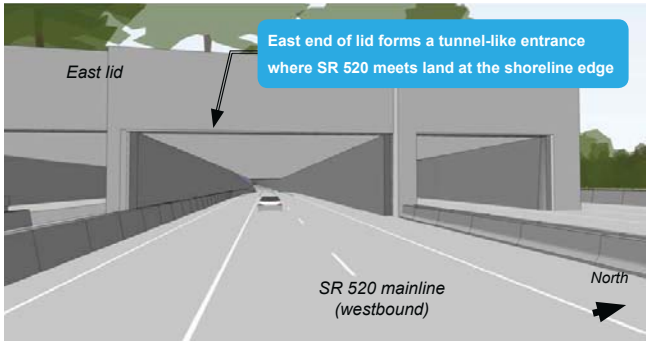
Design intent

- **Gateways**
  - Ensure that views of continuous vegetation appear to rise up and onto the land bridge from a driver's perspective by creating shoulders of native forest to the north and south.
  - The entry to the tunnel at the east lid portal should be preceded with plantings at the roadway level where space allows.
  - The form and material of vertical surfaces should enhance the expression of the layered gateway sequence.
- **Land bridge**
  - To support the bridge's function as a primary gateway element, create a tapered, lofted edge profile allowing views of the land bridge vegetation from afar and below.

See Appendix A for more information on Design Intent.

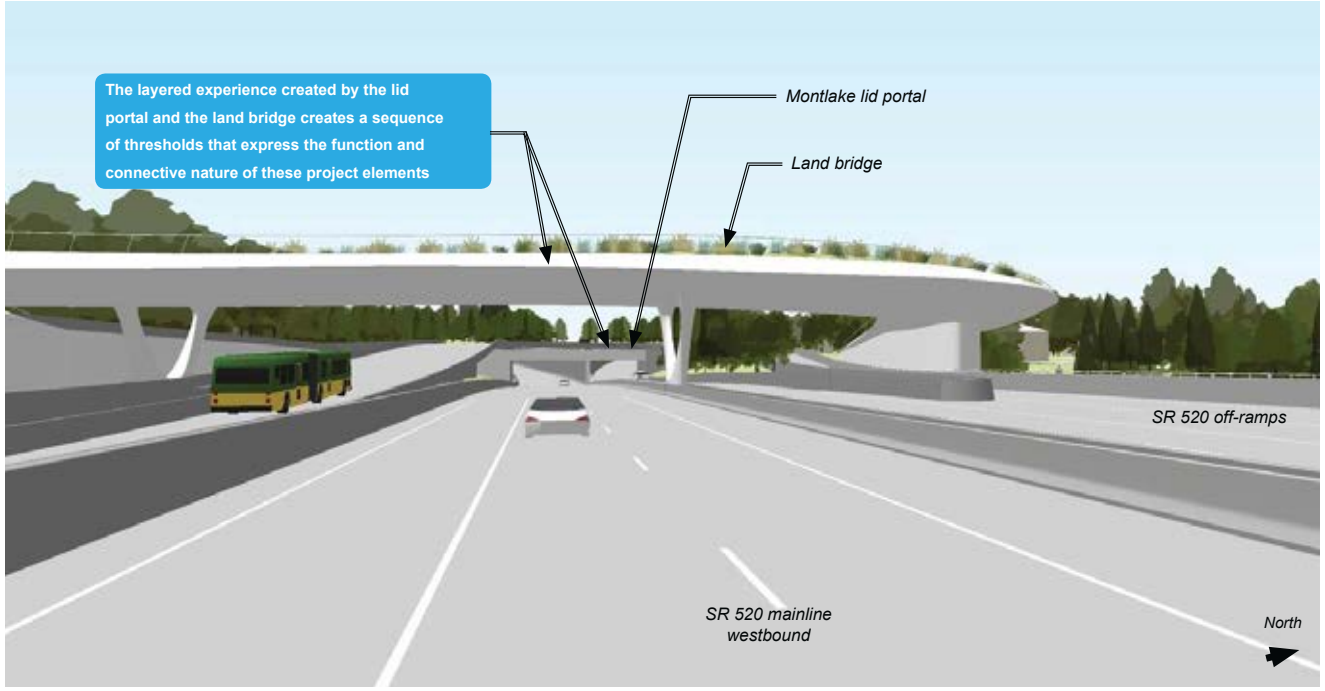
Note: Forms of land bridge piers as illustrated may evolve to meet site-specific engineering requirements.

Location Key: *View facing west along SR 520 mainline approaching the land bridge.*



Preliminary Concept Design

Final Concept Design



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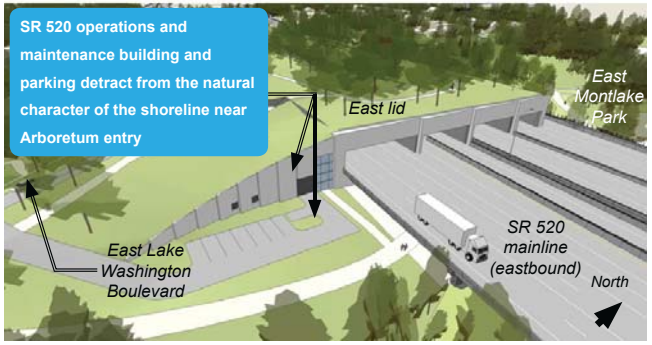
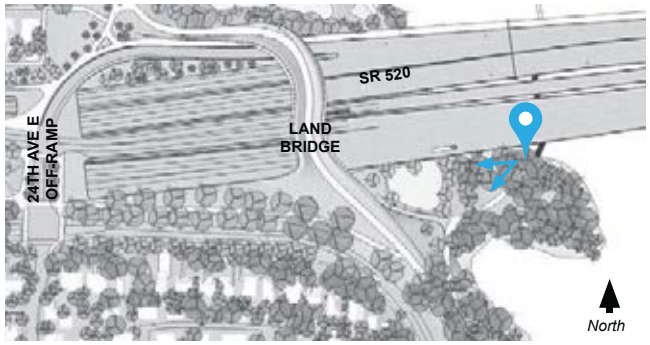
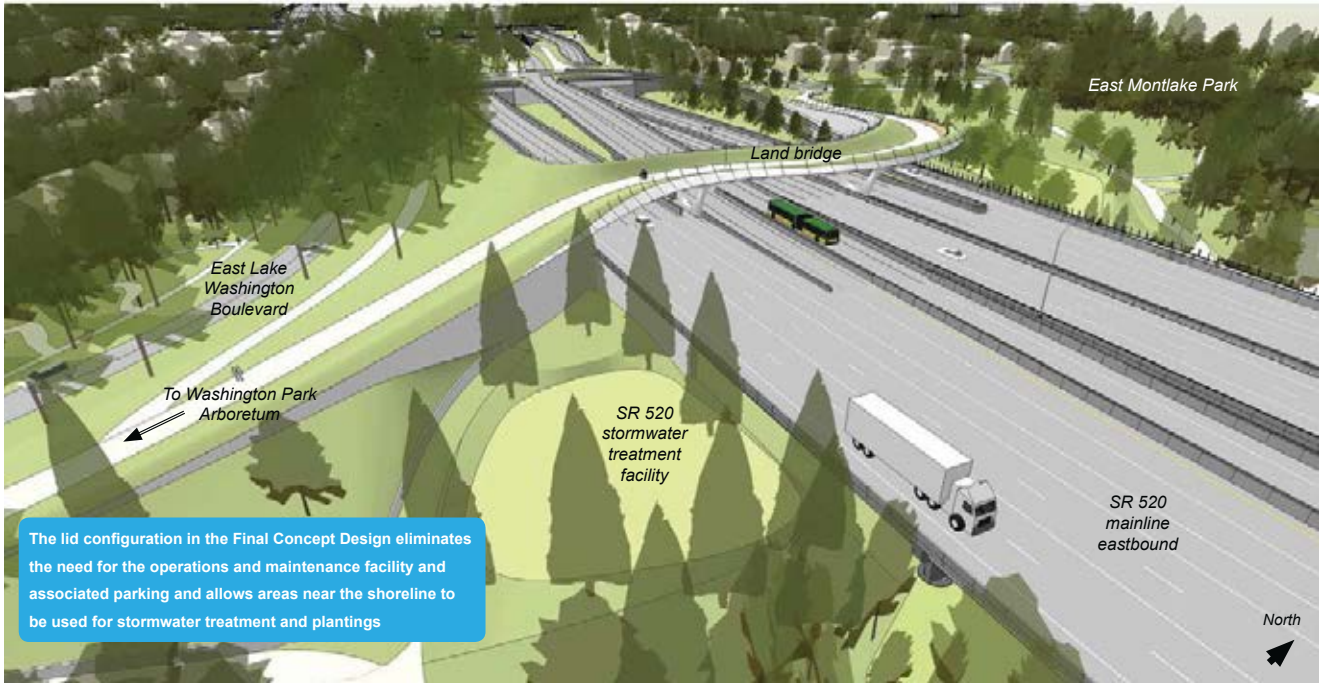


Preliminary Concept Design



Location Key: *View facing west toward south stormwater facility.*

Final Concept Design



VIEW 18: South Stormwater Facility

Background and context

The length of the lid in the Preliminary Concept Design required an 11,500-square-foot operations and maintenance building and parking area to provide support for emergency systems for the lid tunnel. This building was located beneath the east lid at the Lake Washington shoreline, near the entry to the Washington Park Arboretum.

Design refinements

- The reconfigured lid allows for the removal of the operations and maintenance building and parking lot, resulting in more useable open space near the Lake Washington shoreline.
- Additional space for stormwater treatment in the form of wetlands and trees near the shoreline has been provided.
- More space is available for trees adjacent to the roadway.

Design intent

- **Stormwater**
  - Distribute treatment areas for the West Approach Bridge and Montlake lid to utilize areas available on both sides of SR 520.
  - Provide pumping if required to route stormwater to the south treatment facility.
- **Gateways**
  - Maintain space adjacent to the SR 520 mainline for large trees to be visible from the roadway.

See Appendix A for more information on Design Intent.

Note: Forms of land bridge piers as illustrated may evolve to meet site-specific engineering requirements.

VIEW 19:
Arboretum Pathway

Background and context

In the Preliminary Concept Design, the north-south regional path was located adjacent to the Lake Washington shoreline, passing under 280 feet of the SR 520 mainline. Stakeholders expressed concern that this pathway would feel unsafe and would not be pleasant to use.

Design refinements

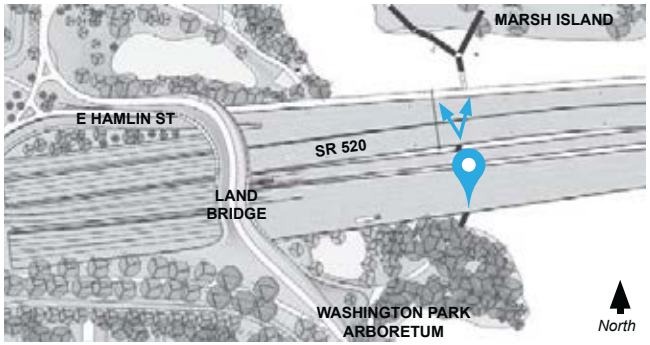
- The north-south regional path has moved to the land bridge, which provides a continuous, at-grade connection over SR 520.
- The shoreline trail has moved out over water to become part of the Washington Park Arboretum trail system and its slower immersive experience of wetlands, islands and boardwalks.*
- The boardwalk trail increases user visibility and discourages potential nuisance behavior under SR 520 near the bridge abutment.

Design intent

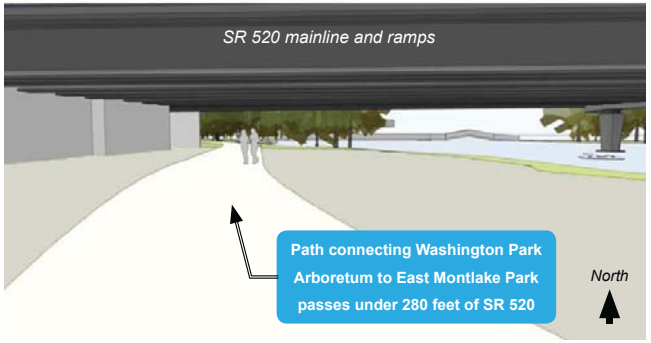
- **Urban trails**
  - Provide appropriate trail widths based on projected use and guidance from appropriate current standards.
- **Community character**
  - Design the new trail connection to be compatible with the function and character of the existing network of Arboretum paths and trails.

See Appendix A for more information on Design Intent.

**The pathway alignment as illustrated in this report is one potential solution for this important non-motorized connection; specific landing points and layout are subject to further study by WSDOT and the city of Seattle.*



Location Key: *View facing north along boardwalk under SR 520 mainline.*



Preliminary Concept Design

Final Concept Design

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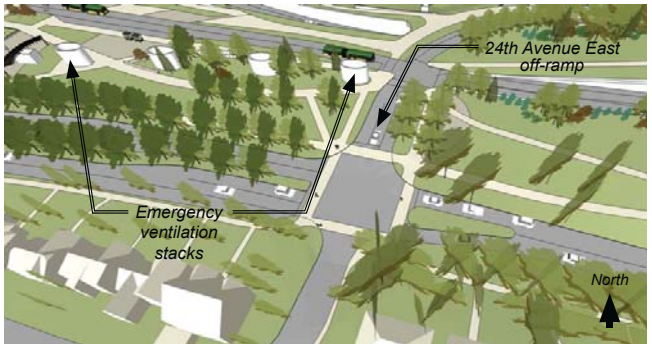


Preliminary Concept Design

Location Key: *Bird's-eye view toward 24th Avenue East at the lid, facing northwest.*

Final Concept Design

VIEW 20:
24th Avenue East Off-ramp

Background and context

The highway project meets the city street grid at the intersection of the 24th Avenue East off-ramp and East Lake Washington Boulevard. The regional shared-use path, located adjacent to the SR 520 off-ramps, travels through this area to continue toward the path facility on the West Approach Bridge, completing the east-west connection across the lid.

Design refinements

- The intersections of the 24th Avenue East off-ramp with East Lake Washington Boulevard and the HOV on- and off-ramps will be designed for reduced vehicle speeds with four-way stops to improve pedestrian safety on the lid and where the highway meets the city street grid.
- Curbs have been designed to reduce vehicle speed around turns.
- Crosswalks have been located so that they will provide shorter, more direct pedestrian crossings.
- The emergency ventilation stacks have been removed and no longer dominate the 24th Avenue East off-ramp area.

Design intent

- **Sidewalks and crosswalks**
  - Consider distinct pavement color and durable materials at crosswalks that heighten driver and pedestrian awareness of crossings.
  - Consider providing button-activated flashing warning beacons for vehicular traffic at non-signalized pedestrian crossings.
  - Provide vegetated buffers between sidewalks and roadways wherever possible.
  - Provide sidewalk widths and materials consistent with city of Seattle standards.

See Appendix A for more information on Design Intent.

Seattle Design Commission recommendations for future design development

The Seattle Design Commission (SDC) was supportive of the "smarter lid" Final Concept Design. However, they also recognized that this new design approach introduces challenges that will need to be addressed in Final Design. The SDC provided key recommendations to guide WSDOT and the city of Seattle in future phases of design. This feedback is summarized below; see Appendix E for the full text of the memo.

- **Environment**
  - Strengthen overall project sustainability strategies.
- **Enhance the sequential gateway experience**
  - Consider SR 520 as a succession of elements that together create a larger gateway experience.
  - Consider the experience for thresholds moving north-south as well as east-west.
- **Strengthen connectivity and wayfinding**
  - Develop a clear pathway hierarchy to reflect travel patterns and destinations.
  - Continue to study non-motorized pathways with particular attention to areas where trails converge and may create potential "pinch points."
- **Land bridge**
  - Continue to study the land bridge as a unique and expressive typology that enhances user experience.
  - Continue to resolve land bridge connections to the north and south.
- **Montlake lid**
  - Ensure the success of the "urban trailhead" concept by proactively programming spaces for desired civic outcomes.
  - Improve the experience of non-motorized users crossing the lid along the 24th Avenue East off-ramp.

The new land bridge will provide an accessible connection between the Washington Park Arboretum and East Montlake Park, as well as points beyond. Husky Stadium will be visible from the land bridge and will serve as a recognizeable wayfinding element (view facing north).

- **Montlake Boulevard East**
  - Develop design articulation on the west side of Montlake Boulevard East.
  - Continue to look for opportunities to win space for transit users, cyclists, and pedestrians near the intersection of Montlake Boulevard East and East Lake Washington Boulevard.
  - Continue to explore the idea of providing a bicycle and pedestrian bridge over the Montlake Cut to the east of the existing bascule bridge, in alignment with 24th Avenue East.

Appendix A addresses some of these issues and concerns by documenting the design intent of specific project elements and systems. The information contained in the design intent appendix will serve as a "jumping-off" point for Final Design.

Final next steps

The design development presented in this chapter constitutes the Final Concept Design for the Portage Bay Bridge, the Montlake lid area, and the network of non-motorized connections. With the exception of the Montlake corridor, on which WSDOT and the city will continue to work together (see Chapter 4), the Final Concept Design is ready to move forward to Final Design and construction. WSDOT will continue to work with the State Legislature to seek funding for the remaining unfunded corridor elements.

04 NEXT STEPS

"It is clear from research that public projects impact health. With the SR 520 Bridge Replacement and HOV Project, the region has an opportunity it won't see again for at least a half-century to build communities that are healthy places to live, work, and play."

SR 520 Health Impact Assessment, Puget Sound Clean Air Agency & Public Health - Seattle and King County September 2008

NEXT STEPS

As project construction funding is pending, WSDOT has continued to develop the design preferences identified during the 2012 Seattle Community Design Process (SCDP) into the Final Concept Design, completed in 2014. WSDOT is now ready for funding and will complete Final Design and begin construction of Seattle project elements as funding becomes available.

Continued study of the Montlake corridor

Although significant progress has been accomplished on the major elements of the west side, some areas remain that continue to be refined. Collaboration between WSDOT and the city of Seattle on the 2014 design work highlighted the need for further targeted studies along the Montlake corridor, particularly at the interchange between SR 520 and Montlake Boulevard East.

Existing conditions:

- Montlake Boulevard East functions as a high-volume principal arterial, a transit street, a regional connector, a major freight corridor, and a segment of a designated State Highway (SR 513).
- Montlake Boulevard East provides one of only three locations to cross Portage Bay and the Montlake Cut east of Lake Union; Montlake is the third-busiest crossing of the Lake Washington Ship Canal behind I-5 and SR 99. In 2012, the PM peak hour traffic volume on the bridge exceeded 2,100 vehicles in each direction.
- The Montlake neighborhood is in the process of being nominated as a Historic District on the National Register of Historic Places (2014).

Ongoing projects that will affect the function of this area include:

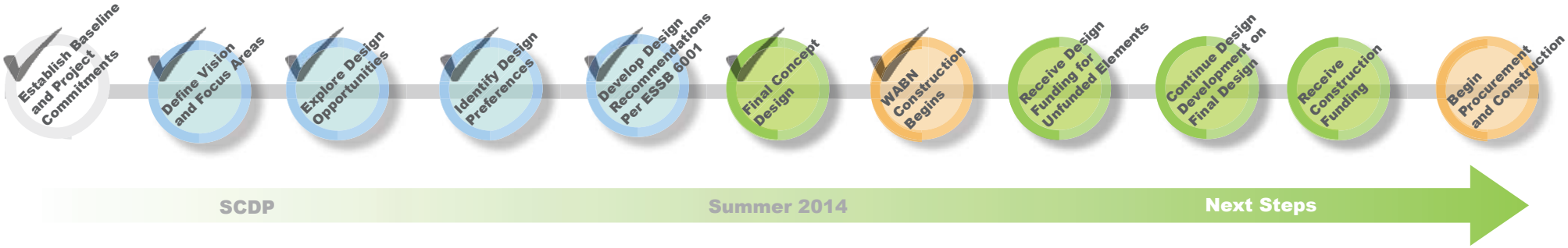
- Sound Transit's University Link Light Rail station is likely to have a substantial impact on travel patterns and volumes for all modes. Service at the University of Washington Station is expected to begin in 2016.
- SDOT's 23rd Avenue Corridor Improvements Project, which will improve the roadway for transit, pedestrians, and cyclists in accordance with Complete Streets guidelines, will begin Phase I construction in early 2015. Phase 3 of the project, which is not currently funded for construction, will extend corridor improvements from East John Street to East Roanoke Street. WSDOT and the city of Seattle will continue to coordinate on planned mobility improvements between Roanoke Avenue East and the Montlake Triangle.
- The 2014 *Seattle Bicycle Master Plan* (BMP) calls for a cycle track (protected bicycle lanes) along Montlake Boulevard East between the Montlake Cut and 22nd Avenue East. The BMP also lists increased non-motorized capacity at the Montlake Cut crossing (either via a new bridge or by renovating the existing bridge) as a catalyst project.
- Interim improvements will be made on Montlake Boulevard East with SR 520 West Approach Bridge North construction, including:
  - Intersection improvements, such as improved exits and merges, transit stops, pedestrian crossings and sidewalks, and improved connectivity for bicyclists.
  - Connections to local and regional bicycle and pedestrian routes from the new regional shared-use path across Lake Washington.

Montlake Cut crossing study

- A 2012 city of Seattle study, *Establishment of Triggers: Second Montlake Bridge Workshop*, which assessed whether and when to construct a second bascule bridge across the Montlake Cut, determined that the second bascule bridge as proposed in the SR 520, I-5 to Medina Project FEIS may not be the best long-term solution for improving multimodal mobility across the Montlake Cut.
- The city is currently studying a range of alternative Montlake Cut crossing options. The crossing option that is selected will have implications for the design of pedestrian and bicycle facilities on Montlake Boulevard East between the Montlake Cut and the SR 520 interchange. See the *Non-motorized Connectivity Technical White Paper* in Appendix B for a more detailed discussion of potential bridge options being studied.
- Additional project elements within the Montlake corridor may be addressed by the city as part of the Conceptual Design process or in Final Design.

The Montlake Bridge serves both local and regional transit networks.

For bicyclists, the Montlake Bridge serves as a key connection along the Lake Washington Loop, an important regional bicycle route.



Because a strategy for the second Montlake Cut crossing is still being determined, some project elements within the Montlake corridor remain unresolved. Some of these items will be addressed by the city of Seattle in the Conceptual Design process, while others will be addressed in Final Design.

Highlighted areas for next steps:

Conceptual design - to be resolved by the city of Seattle:

1. Montlake Cut crossing

- The 2012 *Establishment of Triggers* report suggests that the Second Bascule Bridge design as proposed in the SR 520, I-5 to Medina Project FEIS may not be the preferred long-term solution.
- The city of Seattle is exploring a range of crossing options for the Montlake Cut in conjunction with Montlake Boulevard East non-motorized improvements (see pp. 24-25 for a description of the options).

2. Montlake Boulevard East non-motorized improvements

- The 2014 design work that was completed on the Montlake corridor explored options for improving pedestrian and bicycle infrastructure and connectivity along Montlake Boulevard East between the Montlake Cut crossing and the SR 520 interchange (see *Non-motorized Connectivity Technical White Paper* in Appendix B). The crossing type and location selected for the Montlake Cut will contribute to the final decision regarding multimodal improvements along Montlake Boulevard East.

Continued stakeholder coordination during Final Design:

3. Non-motorized improvements south of the SR 520 interchange

- The city of Seattle to identify a process for incorporating proposed pedestrian and bicycle facilities into in the *Seattle Bicycle Master Plan* and the *Seattle Pedestrian Master Plan* (see *Non-motorized Connectivity Technical White Paper* in Appendix B for further information).
- South of the SR 520 interchange between East Lake Washington Boulevard and East Roanoke Street, continue to work toward the goal of creating safe and comfortable spaces and routes for transit users, cyclists and pedestrians while working to maintain the viability of the market and gas station as a community asset.

Implementation of the Final Concept Design

Upon receiving funding for additional project elements, WSDOT will move into implementation to finalize the design. This phase will include:

- Documenting compliance with existing National Environmental Policy Act (NEPA) analysis, permits, and the Section 106 Programmatic Agreement.
- Updating the Neighborhood Traffic Management Plan.
- Developing the next chapter of a community construction management plan.
- Implementing all relevant EIS commitments.
- Documenting compliance with WSDOT best practices.
- Addressing Seattle City Council recommendations pertaining to the Final Concept Design presented in this report.

As needed, WSDOT will seek policy guidance, issue resolution, and executive level implementation to achieve these commitments. Upon completing these commitments, WSDOT will move forward with project construction.

How can I learn more?

Join the project e-mail update list. WSDOT will continue to keep the public informed about opportunities for input as the project moves forward with Final Design and construction. If you provide your name and email address, we will add you to the project email list, which allows you to receive regular email updates. You may join the email list by logging onto the WSDOT website at www.wsdot.wa.gov/projects/SR520Bridge, by calling the project office at **206-770-3500**, or by emailing the project at **SR520Bridge@wsdot.wa.gov**.

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05 GLOSSARY OF TERMS

"Both the natural and built environment impact walking opportunities and can create barriers that are especially challenging for children, people with disabilities, and older residents."

Seattle Pedestrian Master Plan, Seattle Department of Transportation

September 2009

GLOSSARY OF TERMS

AASHTO
American Association of State Highway and Transportation Officials

Activate
To make active through programming that provides opportunities for people-watching and engagement in activities or other interesting experiences.

ADA
Americans with Disabilities Act

BMP
(Seattle) Bicycle Master Plan

CPTED
Crime Prevention Through Environmental Design

Cycle track
A cycle track is a protected bike lane that combines the user experience of a multi-use trail with a conventional bike lane. Cycle tracks have different forms, but all share common elements — they provide space that is used for bicycles and that is separated from motor vehicle travel lanes, parking lanes and sidewalks.

EIS
Environmental Impact Statement (appears in this report in the context of the "SR 520, I-5 to Medina Project EIS")

Elements of continuity
A design approach used to ensure that elements reoccurring throughout the project corridor, such as retaining walls, roadside plantings or the regional shared-use path, are consistent in their aesthetic treatments to provide positive user guidance and experience.

Elements of distinction
A design approach that ensures that the look and feel of singular project elements, such as the Portage Bay Bridge or the Montlake and 10th and Delmar lid portal entries, receive unique aesthetic treatments that are sensitive to the surrounding context.

ESSB 6001
Engrossed Substitute Senate Bill 6001 (passed 2014) directed WSDOT to continue working with the Seattle Department of Transportation in their joint planning, design, outreach, and operation of the remaining SR 520 west side elements.

ESSB 6392
Engrossed Substitute Senate Bill 6392 (passed 2010) outlined specific areas and elements of the SR 520 project Preferred Alternative to refine through a multi-agency process.

FEIS
Final Environmental Impact Statement

FHWA
Federal Highway Administration

Gateway
Gateways are natural features, such as trees or waterways, or built elements, such as a bridge, buildings, signage or art work, that define a city or area entrance or boundaries and provide a sense of identity and arrival. A gateway can be large or small in scale, and linear or singular, depending on context.

HOV
High-occupancy vehicle

LRT
Light Rail Transit

MOHAI
Museum of History & Industry

MOU
Memorandum of Understanding

MUTCD
Manual on Uniform Traffic Control Devices

NACTO
National Association of City Transportation Officials

NOAA
National Oceanic and Atmospheric Administration

Preferred Alternative
The project design selected through the environmental review (EIS) process.

RFP
Request for proposals

ROD
Record of Decision

RSUP
Regional shared-use path

SCDP
Seattle Community Design Process

SDC
Seattle Design Commission

SDOT
Seattle Department of Transportation

Section 106
Projects with federal funding, federal permits, licenses, or approvals, or located on federal land must comply with Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended. Section 106 calls for meaningful coordination with interested parties to develop projects in a manner that avoids or minimizes impacts to cultural resources, which might include buildings, structures, artifacts, sites, or locations of prehistoric or historical interest.

Sharrow
Pavement markings comprising the image of a cyclist with directional arrows used when bicycle lane striping is not feasible. Sharrows are intended to help drivers and bicyclists share the roadway by clarifying where bicyclists should ride and by alerting vehicles to the presence of bicyclists.

SR
State Route

SR 520 Bridge Replacement and HOV Program
The program enhances safety by replacing the aging floating bridge and keeps the region moving with vital transit and roadway improvements throughout the corridor.

SR 520 I-5 to Medina: Bridge Replacement and HOV Project
The project replaces the interchanges and roadway between I-5 in Seattle and the eastern end of the SR 520 floating bridge.

TIFIA
The Transportation Infrastructure Finance and Innovation Act provides federal funding for transportation projects.

UW
University of Washington

UWBG
University of Washington Botanic Gardens

VMT
Vehicle miles traveled

WABN
West Approach Bridge North

WABS
West Approach Bridge South

WSDOT
Washington State Department of Transportation

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APPENDIX A
DESIGN INTENT

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APPENDIX A

DESIGN INTENT

Introduction

The following appendix summarizes the guiding principles used to refine the project design in 2014. These principles communicate the design intent for continued design development as the project progresses into the Final Design phase. In order to realize many of the project elements and desired qualities identified and described in this section, ongoing collaboration between WSDOT and partner stakeholders, such as the city of Seattle, and further study will be required.

Proposed improvements were driven by practical considerations and informed by best practices. Although the project is currently in the early stages of the design process, these recommendations address not only large-scale urban design requirements but also look toward the implications of those ideas at a more detailed level. Recommendations that appear to be "aesthetic" in nature are tied directly to improving the human experience of the facility while supporting corridor capacity and safety goals. The design principles outlined in this section are intended to apply to the entire Seattle portion of the project, from the I-5/Roanoke area across Portage Bay to the Montlake area, and to the West Approach Bridge.

Project principles of "sustainability, utility, and expression" are embedded in each of the sections detailed here. These principles should continue to inform the evolution of the project as it moves forward into Final Design. While the particular details and resolution of each element will evolve, this appendix should be used as a reference to direct that evolution.

The proposed design refinements described in this appendix will be evaluated for consistency with the Section 106 programmatic agreement, in which WSDOT made specific commitments to help protect historic communities and cultural resources. These key commitments include the following:

- Implement measures to help ensure design consistency with the Olmsted plan for Seattle's parks.
- Implement measures to help enhance and ensure compatibility with the historic character of the Roanoke Park and Montlake Historic Districts.
- Develop a Community Construction Management Plan to support best practices and good communication and to minimize construction impacts on historic properties and members of the public.

Elements of continuity and distinction

The refined vision and design principles that provide the foundation for continued design development build upon historic precedents, extensive public input and professional design experience. During the conceptual design process, the WSDOT design team explored opportunities for creating a consistent visual and aesthetic relationship among elements that appear throughout the corridor, or elements of continuity, to improve user guidance and experience. At the same time, creating a design that responds to the combination of requirements unique to each condition results in distinctive moments and places. The ultimate goal is that users moving through the project area should have a memorable and enjoyable experience unique to this part of Seattle.

Design intent elements

The following sections of this appendix present the design intent for the following project elements:

- Sidewalks and crosswalks
- Urban trails
- Undercrossings
- Land bridge
- Gateways
- Gathering places
- Stormwater
- Olmsted legacy and Section 106 commitments
- Vegetation

The Final Concept Design includes many improved connections for non-motorized users, including a more generous and mode-separated Montlake Boulevard East undercrossing.

City of Seattle Washington State Department of Transportation

SIDEWALKS & CROSSWALKS

Description

Sidewalks and crosswalks exist throughout the project area, adjacent to and over SR 520. They provide a means for people to travel through the area without an automobile, and they allow access to various destinations such as homes, parks, and businesses. They also provide important connections to the University of Washington, the Washington Park Arboretum, and surrounding neighborhoods. Shared-use paths and other urban trails that are designed to include bicyclists are addressed in the *Urban Trails* design intent section (see pp. 86-87).

Location

- Sidewalks along Montlake Boulevard East from East Roanoke Street to the Montlake Bridge
- Sidewalks along East Lake Washington Boulevard
- Sidewalks and crossings on the 24th Avenue East off-ramp at East Lake Washington Boulevard and at the SR 520 HOV on- and off-ramps
- Crosswalks at East Roanoke Street, East Shelby Street, East Hamlin Street, and East Lake Washington Boulevard

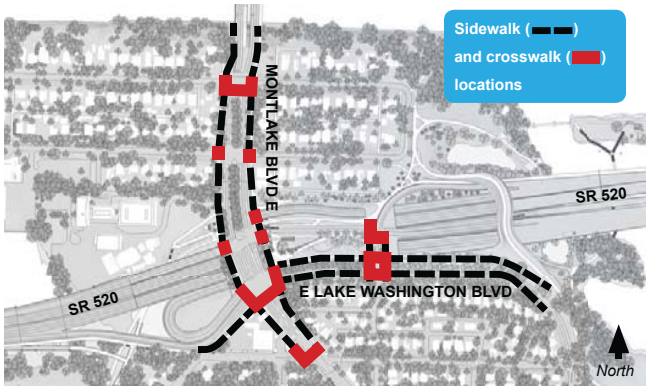
Performance outcomes

- Enhance mobility for users of all ages and abilities.
- Create intuitive, safe, and direct non-motorized connections.
- Improve neighborhood connectivity.
- Provide access to area parks and open space.
- Meet pedestrian volume needs.
- Reduce crossing distances for pedestrian safety.
- Enhance driver awareness of crossing zones.
- Provide sidewalk and trail connections that are easy for pedestrians and other non-motorized users to understand so they can easily wayfind and navigate to their destination.

Design recommendations

- Provide raised crosswalks in the north-south direction along Montlake Boulevard East (specifically at East Shelby Street and East Hamlin Street; consider other locations as appropriate).
- Minimize crossing distances, especially at crossings with more than two lanes, by reducing lane widths and narrowing the curb-to-curb distance at crosswalks.
- Design signal timing to allow adequate crossing time for users of all ages and abilities, including those using mobility assistance devices. Provide adequate signal timing to allow for crossing times based on a minimum crossing speed of 3.5 feet per second or less per the *Manual on Uniform Traffic Control Devices*.
- Consider distinct pavement color, materials, and/or durable markings at crosswalks that heighten driver and pedestrian awareness of crossings. Use this treatment consistently for crosswalks in the project area, particularly for all crosswalks along Montlake Boulevard East.
- Consider current and projected pedestrian volumes when sizing sidewalk and crosswalk elements. A minimum sidewalk width of ten feet is recommended on both sides of Montlake Boulevard East at the SR 520 Montlake lid and to the north, based on current pedestrian volumes. Provision of additional width, based on current design standards, should be considered in areas anticipated to experience significant bicycle traffic and/or higher future pedestrian volumes. See also the *Urban Trails* design intent section (pp. 86-87) for more information on shared-use paths and cycle tracks.
- Provide a sidewalk that could be used by greenway cyclists (e.g. users of all ages and abilities, including children, elderly, etc.) along the west side of Montlake Boulevard East from East Roanoke Street to the Montlake Cut.
- Consider providing button-activated flashing warning beacons for vehicular traffic at non-signalized pedestrian crossings.

Location key



A conceptual rendering showing a bird's-eye view of the "Urban Trailhead" area of the future Montlake lid over SR 520. A continuous paving pattern extends the character of the sidewalk across the SR 520 HOV/Direct access lanes (view facing southeast).

Washington State Department of Transportation
City of Seattle

Precedents

This crossing on Lonsdale Street in Victoria, British Columbia provides additional pedestrian safety by heightening driver awareness of the pedestrian zone by using specialty paving. (Source: BKK Architects)

A raised crosswalk with specialty paving to alert motorists to crossing in Port Townsend, WA. (Source: SvR Design Company)

This raised crossing in Seattle provides additional pedestrian safety by heightening driver awareness of the pedestrian zone across the roadway. (Source: City of Seattle)

A raised crossing (speed table) in Forest Park, IL. (Source: Steve Vance, Flickr)

- Provide vegetated buffers between sidewalks and roadways wherever possible.
- Material selection should reinforce the use of city sidewalks, shared-use pathways and pause points (e.g. concrete for sidewalks).

Life cycle considerations

- Maintain pavement markings.
- Maintain sidewalks on lid, along arterials and adjacent to city-managed trees.
- Maintain sidewalks along residential streets lacking city-managed trees.

Design resources

- Public Right of Way Accessibility Guidelines (PROWAG)
  - » Chapter R3 – Technical Requirements, http://www.access-board.gov/guidelines-and-standards/streets-sidewalks/public-rights-of-way/proposed-rights-of-way-guidelines/chapter-r3-technical-requirements
- Seattle Right-of-Way Improvements Manual (ROWIM)
  - » Chapter 4 – Design Criteria: Sidewalks (4.11), http://www.seattle.gov/transportation/rowmanual/manual/4_11.asp
  - » Chapter 4 – Design Criteria: Crosswalks (4.12), http://www.seattle.gov/transportation/rowmanual/manual/4_12.asp
- WSDOT Design Manual
  - » Chapter 1510 – Pedestrian Facilities, http://www.wsdot.wa.gov/publications/manuals/fulltext/M22-01/1510.pdf
- National Association of City Transportation Officials (NACTO) Urban Street Design Guide
  - » Sidewalks – http://nacto.org/usdg/street-design-elements/sidewalks/
  - » Intersections – http://nacto.org/usdg/intersections/
  - » Raised Intersections – http://nacto.org/usdg/intersections/minor-intersections/raised-intersections/
- Manual for Uniform Traffic Control Devices (MUTCD)
  - » Section 4E.06 Pedestrian Intervals and Signal Phases

URBAN TRAILS

Description

Urban trails include shared-use paths, cycle tracks and other paths and walkways that are intended to serve mixed modes of non-motorized users. Urban trails are located throughout the project area. The regional shared-use paths are the most prominent urban trails. Others include the bicycle and pedestrian route along the east side of Montlake Boulevard East from the SR 520 lid north to the Montlake Cut and the pathway through the Canal Reserve area.

Location

- Montlake lid area
- East side of Montlake Boulevard East from the SR 520 lid north to the Montlake Cut
- Pathway through the Canal Reserve

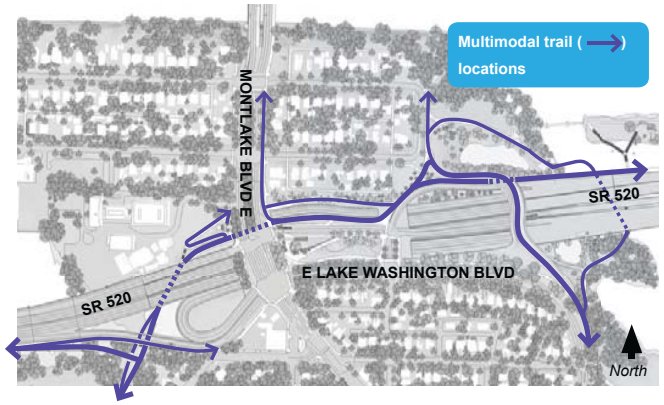
Performance outcomes

- Improve regional and neighborhood non-motorized connections for users of all ages and abilities.
- Provide more options for direct, convenient, intuitive and safe access to existing and future networks and destinations.
- Ensure that the “Urban Trailhead” at the Montlake lid on the east side of Montlake Boulevard East is easily accessible to all potential users.
- Create a north-south neighborhood greenway connection across SR 520.

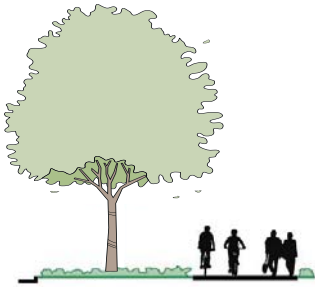
Design recommendations

- Keep site furnishings, vegetation, or other obstructions clear of sidewalks, paths, cycle tracks, etc.
- Provide a facility along the east side of Montlake Boulevard East that will accommodate current and projected volumes of bicyclists and pedestrians at an acceptable level of service.
- Provide sidewalks of appropriate widths to accommodate greenway cyclists (e.g. cyclists of all ages and abilities, including children, elderly, etc.) in combination with pedestrians at key connection points where roadway travel is not acceptable for all ages and abilities, such as along the west side of Montlake Boulevard East from East Roanoke Street north across SR 520.
- Provide appropriate trail widths based on projected use and guidance from appropriate current standards (e.g. AASHTO, NACTO).
- Provide vegetated buffers from adjacent roadways with barriers as necessary.

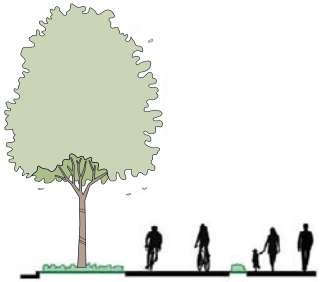
Location key



Urban trail options



Shared-use path section



Two-way cycle track with separate sidewalk section

Precedents

Elmer's Two Mile Park in Boulder, CO. (Source: Loris and Assoc.)

The Burke-Gilman Trail, near Golden Gardens in Seattle. (Source: SvR Design Company)

The Chief Sealth Trail in Seattle. (Source: SvR Design Company)

Lady Bird Lake Trail, a shared-use path above water and land in Austin, TX. (Source: Austin American-Statesman)

Life cycle considerations

- Plan for and allocate appropriate resources to keep trails operating at a high level of service.
- Ensure that adjacent vegetation is managed to provide a safe and inviting experience for trail users.

Design resources

- American Association of State Highway and Transportation Officials (AASHTO) Guide for the Development of Bicycle Facilities, 2012 4th Edition
  - Chapter 5 – Design of Shared Use Paths (not available electronically)
- National Association of City Transportation Officials (NACTO) Urban Bikeway Design Guide (see sections on Bike Lanes, Cycle Tracks)
  - Cycle Tracks – http://nacto.org/cities-for-cycling/design-guide/cycle-tracks/

UNDERCROSSINGS

Description

Undercrossings occur where regional shared-use pedestrian and bicycle paths cross under roadways or bridges to provide safe passage for pedestrians and cyclists.

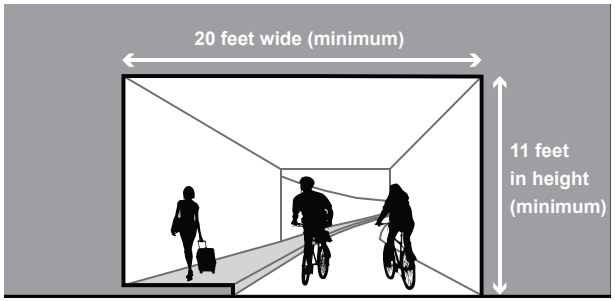
Location

- At the SR 520 interchange below Montlake Boulevard East (SR 513)
- Below the SR 520 mainline along the Bill Dawson Trail

Performance outcomes

Safety

- Minimize the potential for collisions by designing the width of the passageway to allow for simultaneous comfortable passing by both pedestrian users and cyclists.
- Clearly define and/or separate the pedestrian zone from the bicycle zone. Strategies may include a distinctive surface treatment and/or a minor grade differential (e.g. a rolled curb). The pedestrian portion of the path should be a minimum of eight feet wide and the bicycle path should be a minimum of 12 feet wide.
- Ensure a minimum clear height of 11 feet within the passageway.
- Design walls to be without recesses or other corners or signs that a bicyclist might hit.
- Avoid or minimize the curvature of the pathway within and outside the undercrossing to maintain sight lines and to facilitate predictable user behavior.
- Avoid dangerous hairpin turns.
- Design passageway and approach lighting to mitigate dramatic contrasts between outside and inside lighting levels, during both day and night.

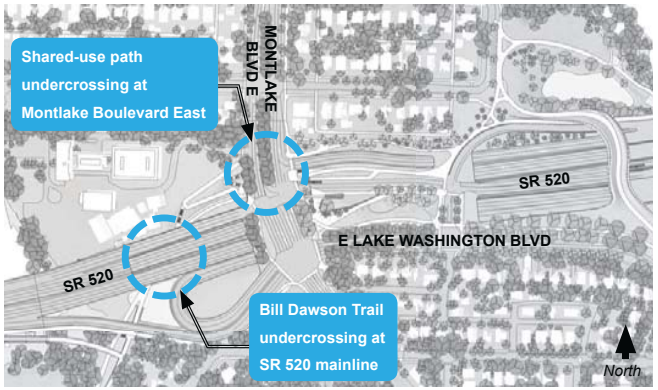


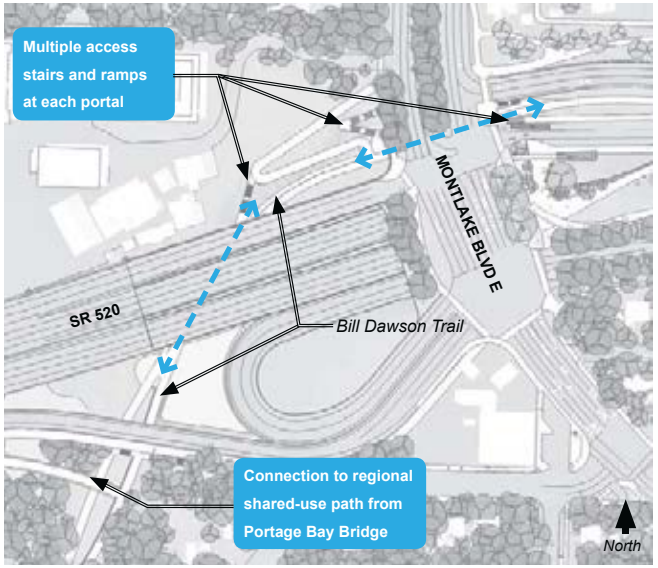
3D schematic diagram of a typical undercrossing with mode separation.

Security/visibility

- Provide adequate sight lines from the approach through the undercrossing to the opposite approach. Approach areas should allow views through the undercrossing at a minimum of approximately 150 feet from either undercrossing entry to allow for full surveillance.
- Provide users with alternate route options via stairs and ramps within or as close to this 150-foot approach area as possible. These options should be clearly visible from the opposite side of the undercrossing.
- Provide lighting that illuminates the face of other users of the space at the approaches and within the undercrossings.
- Design walls, ceiling and landscaping to have a continuous treatment that provides a comfortable transition between undercrossing and approach areas and to facilitate orientation and wayfinding when approaching and passing through those spaces.
- Slope back walls and any associated landscape in the passageway approach area wherever possible to maximize views to and from surrounding areas and to generally maximize natural light.
- Design passageway walls to be smooth and without recessed areas that could potentially restrict full surveillance of the space.
- Provide high-quality materials and thoughtful pedestrian-scale design details to convey the appropriate importance of the space.
- Further evaluate the potential inclusion of emergency call boxes.

Location key



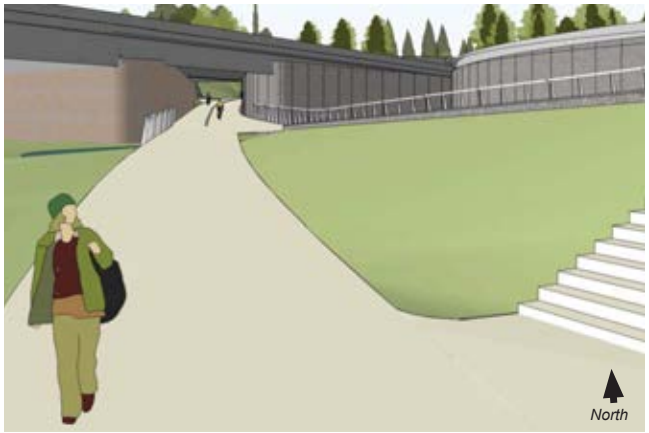


Washington State Department of Transportation
City of Seattle

Precedents

This undercrossing in Vancouver, British Columbia has clear sight lines and separates user modes. (Source: Denver Igarta/Portland Bicycle Plan for 2030)

A bicycle undercrossing in the Netherlands: generous height, smooth reflective walls, and separated paths for pedestrians and cyclists. (Source: Flickr user Stewie1980)



View of the passage below the SR 520 mainline, demonstrating clear views of exit beyond, other occupants, and multiple access points before and after the tunnel.

View of passageway below Montlake Boulevard East with clear views of the exit beyond, tunnel users and activity at street level. The access stair landing is set back from the path of travel to provide adequate space for users to comfortably enter and leave the pathway.

Convenience

- Keep all approaches and areas within the passageways below a five percent maximum grade, consistent with the regional shared-use path, to accommodate and encourage users of all ages and abilities.
- Maintain the smallest possible total elevation change across the pathway alignment to minimize effort required to navigate the pathway.

Design requirements/challenges

To accommodate adequate volumes of vehicular traffic on Montlake Boulevard East, restrictions and/or long distances between at-grade signalized pedestrian crossings are necessary. As a result, alternative grade-separated crossing opportunities that are safe, secure and convenient will be essential to discourage dangerous and illegal crossings and will require exceptional design attention to ensure that they are an attractive choice for pedestrians and bicyclists, particularly when passing underneath a roadway structure.

Life cycle considerations

- Lighting should be regularly checked and maintained for safety.
- Landscaping near the undercrossing and along the approaches should be maintained to ensure clear sight lines through the passage.
- Passage walls should be designed and treated to discourage graffiti.

Design resources

- FHWA's Designing Sidewalks and Trails for Access Best Practices Design Guide, Grade-separated Crossings
  - » http://www.fhwa.dot.gov/environment/bicycle_pedestrian/publications/sidewalk2/sidewalks216.cfm#gra
- Safe Routes to School, Pedestrian and Bicycle Bridges and Tunnels
  - » http://guide.saferoutesinfo.org/engineering/pedestrian_and_bicycle_bridges_and_tunnels.cfm
- Portland Bicycle Plan for 2030, Appendix D p.21
- WSDOT Design Manual 1510.14 (2) Pedestrian Facilities
- Crime Prevention Through Environmental Design (CPTED) Principles
  - » Natural Surveillance, Natural Access Control, Territorial Reinforcement, Maintenance http://cptedsecurity.com/cpted_design_guidelines.htm

LAND BRIDGE

Description

The land bridge provides a north-south pedestrian and bicycle connection along the Lake Washington shoreline. The structure is also the SR 520 corridor's primary gateway element for entering the city of Seattle.

Location

Approximately 450 feet east of 24th Avenue East.

Performance outcomes

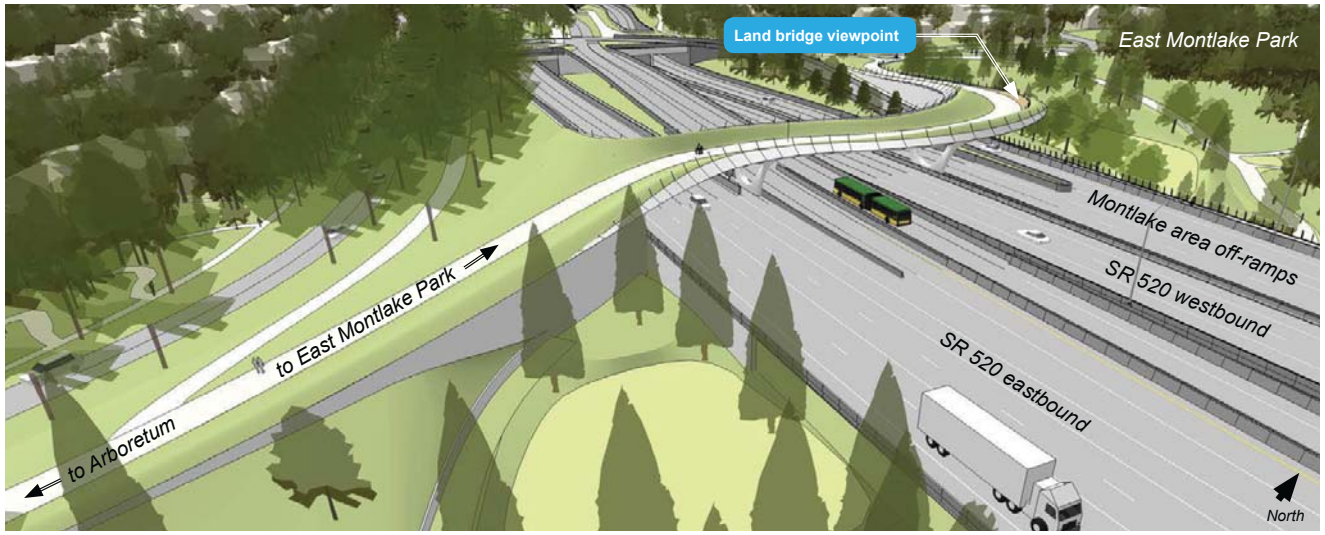
The project requires providing a convenient and attractive grade-separated pedestrian and bicycle connection between the regional shared-use path and the Lake Washington Loop and Arboretum pedestrian and bicycle connections to the south. To minimize traffic impacts upon the surrounding community, this connection should be designed to attract use as the preferred non-motorized route instead of the at-grade option further west, which requires crossing several vehicular lanes of the 24th Avenue East off-ramp.

The sinuous "double curve" bridge configuration being considered carefully balances a set of competing geometric and urban design requirements:

- Align the pathway in relation to the Lake Washington shoreline.
- Provide a perpendicular structural span across the roadway with an approximately 30-foot-wide landscaped area, shaped and planted adequately to visually buffer the path user from awareness of the large expanse of highway below.
- Provide a minimum highway clearance of 17 feet, six inches.
- Maintain an accessible (maximum five percent) grade.

Efficient and convenient

The land bridge concept as shown was shaped primarily by the design goals and requirements listed above. Initial explorations by the urban design team also considered examples of structures that could achieve these competing requirements. In order to maintain a grade of less than five percent, a through girder bridge system was evaluated. This concept allowed the pathway to maintain a relatively low profile while minimizing structural depth of the bridge.



The land bridge alignment provides a perpendicular highway crossing and uses gentle curvature to create a connection along southeast-to-northwest desire lines.

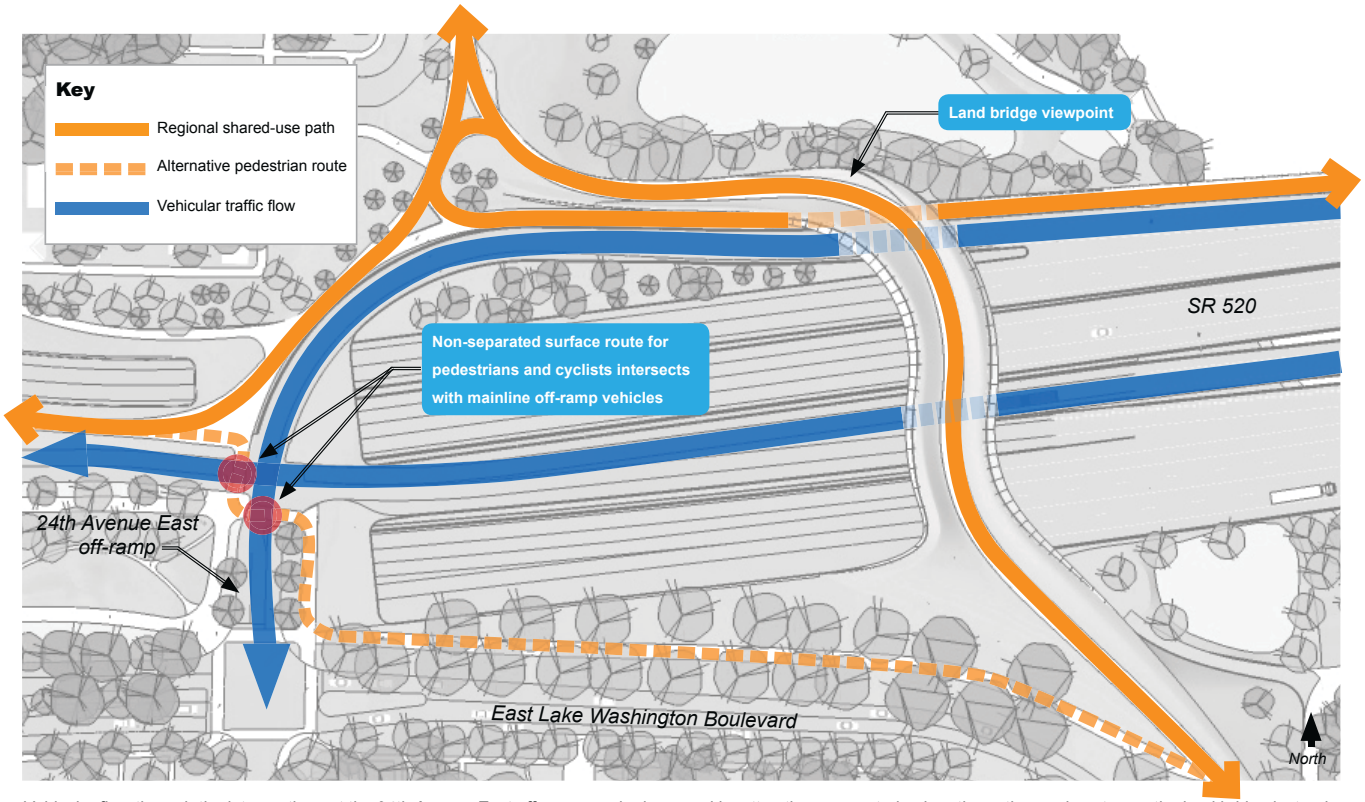
While these early design explorations guided the current Final Concept Design for the land bridge, further structural design by the engineering team will determine the type and geometry that best meets all design requirements.

Pleasant and attractive

- Provide a zone of landscape approximately 30 feet wide on each side of the path to visually buffer views and noise of the highway below.
- Limit soil depth to two feet in order to minimize structural requirements.
- Develop this shallow soil environment as an opportunity to expand Arboretum collections. Refer to the *Vegetation* design intent section (pp. 104-108) for guidance on "Northwest meadow" landscaping.
- Ensure that the landscape cross-section of the land bridge provides a comforting sense of enclosure that counteracts the noise and view of the roadway while maintaining clear lines of sight along the path of travel.
- Create a special viewpoint at the north trail bend directly above the shared-use path on the West Approach Bridge to highlight views of Union Bay, Husky Stadium, Lake Washington and northeast Seattle.
  - The viewpoint also may offer interpretive opportunities regarding the adjacent stormwater treatment facility to the north.
  - The viewpoint area should be adjacent and connected to the shared-use path, taking into consideration best practices for the design of "mixing zones" on multimodal pathways.
- Continue to study opportunities for additional views and/or viewpoints along the bridge pathway.

Note: The forms of the land bridge piers as illustrated may evolve to meet site-specific engineering requirements.

A bird's-eye view of the land bridge, a safe non-motorized crossing that reconnects recreational assets and defines a Seattle gateway where "Nature meets City."



Vehicular flow through the intersections at the 24th Avenue East off-ramp can be improved by attracting non-motorized north-south crossings to use the land bridge instead.

Design requirements/challenges

Convenient

Provide a five percent maximum grade to serve users of all ages and abilities. Minimizing pathway grades and distances may require atypical structural solutions beyond standard precast overpass construction.

Pleasant and attractive

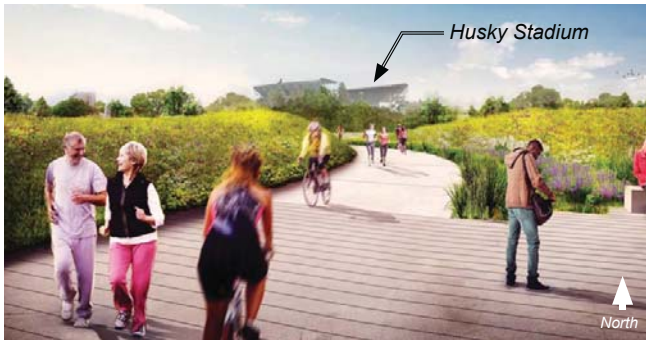
Inviting pedestrians and cyclists to cross the 300-foot span of the land bridge above the noise of fast-moving highway traffic will require a unique and innovative solution beyond typical and simple pedestrian bridge designs over highways. Opportunities for unique views north toward Union Bay and the mountains in the distance suggest provision of a viewpoint amenity.

Complements the natural landscape

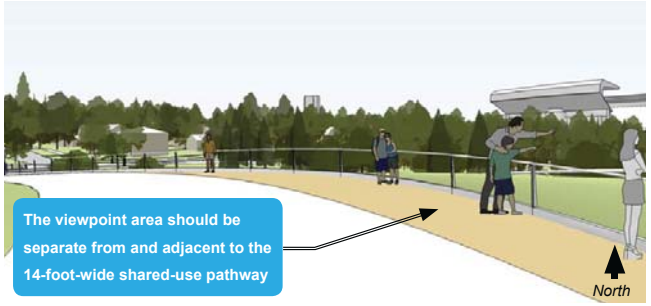
Inserting a significant structure within the sensitive natural environment suggests a bridge design and configuration that incorporate and complement the natural features in the surrounding context.

Appropriate gateway to Seattle

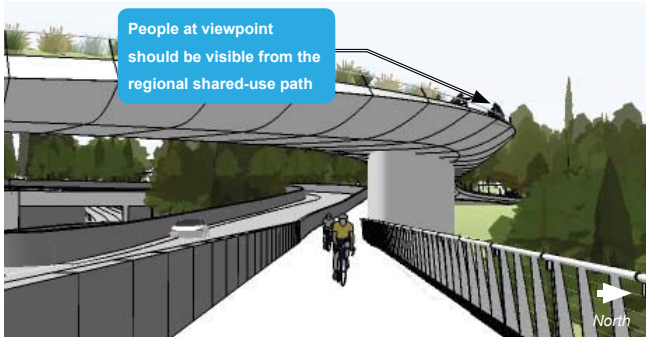
The land bridge is the first "gateway'" into the city of Seattle, and as such provides an important opportunity to create a positive aesthetic impression. Further decisions regarding the design of the land bridge should be guided by the project vision of "Nature meets City."



The experience of crossing the land bridge should provide a continuous encounter with the natural environment as well as visual connections to the city. Views and noise of the highway are buffered by landscape.



The north bend viewpoint offers long-distance views and provides clear lines of sight in both directions of travel along the shared-use path.



The land bridge also serves as a visual goal for users of the shared-use path located on the north side of the West Approach Bridge.

Westbound perspective from the SR 520 mainline. The relatively thin profile of the land bridge and visible plantings on top reduce the visual impact of the structure and enhance its ability to tie together the surrounding landscape.

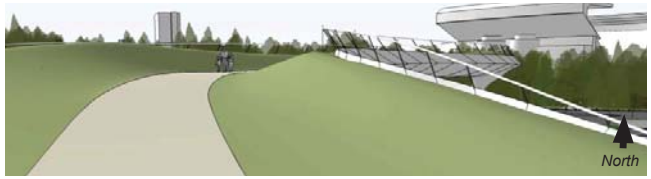
Complements the natural landscape

- The form of the land bridge should echo the curved, non-orthogonal lines of the surrounding natural environment.
- Consider, but do not be limited to, bridge abutment design options that were explored in 2014, such as mechanically stabilized earth (MSE) walls that are shaped to fluidly meet and complement the structural members of the land bridge.

Appropriate gateway to Seattle

Support the function of the land bridge as a primary gateway element by creating a tapered, lofted-edge profile that allows for views of the bridge vegetation from adjacent areas as well as from the roadway below.

Note: The forms of the land bridge piers as illustrated may evolve to meet site-specific engineering requirements.



Views from the south end of the land bridge path may reveal glimpses of its unique structural geometry.

"The [land] bridge profile should be unique and expressive without resembling typical highway infrastructure. Topography and vegetation should provide a unique experience from all angles."

- Memorandum: Recommendations for the Portage Bay Bridge and Montlake Lid components of the SR 520 Replacement Project

Seattle Design Commission, September 17, 2014

Design resources

- WSDOT Design Manual 1510.14 (2) Pedestrian Facilities
- CPTED Principles of Natural Surveillance, Territorial Reinforcement, Maintenance http://cptedsecurity.com/cpted_design_guidelines.htm

Washington State Department of Transportation City of Seattle

Precedents

The "Confluence Project" land bridge in Vancouver, WA. (Source: www.fertile--grounds.blogspot.com)

A rendering of the design for WSDOT's I-90 Rock Knob Wildlife Crossing project.

The Cross-Florida Greenway I-75 Land Bridge. (Source: activeeggplant.com)

Ecoduct deGrimberg in the Netherlands. (Source: Flickr user Chriszwolle)

Ecoduct Borkeld in the Netherlands. (Source: Zwarts & Jansma Architects)

GATEWAYS

Description

In the 2012 Seattle Community Design Process (SCDP) report, gateways were defined as *"natural features, such as trees or waterways, or built elements, such as bridges, buildings, signage or art work, that define a city or area entrance or boundaries and provide a sense of identity and arrival. A gateway can be large or small in scale, and linear or singular, depending on context."*

Location

The east shoreline area where the West Approach Bridge meets land is the first and primary gateway into Seattle. Elements of the gateway include the land bridge and its abutments, adjacent landscape plantings and trees in the stormwater treatment areas, the eastern portals under the Montlake lid and the walls of the "room" defined by the land bridge and the eastern portals. Secondary gateways include the western portal of the Montlake lid, Portage Bay Bridge, and the portals of the 10th and Delmar lid.

Performance outcomes

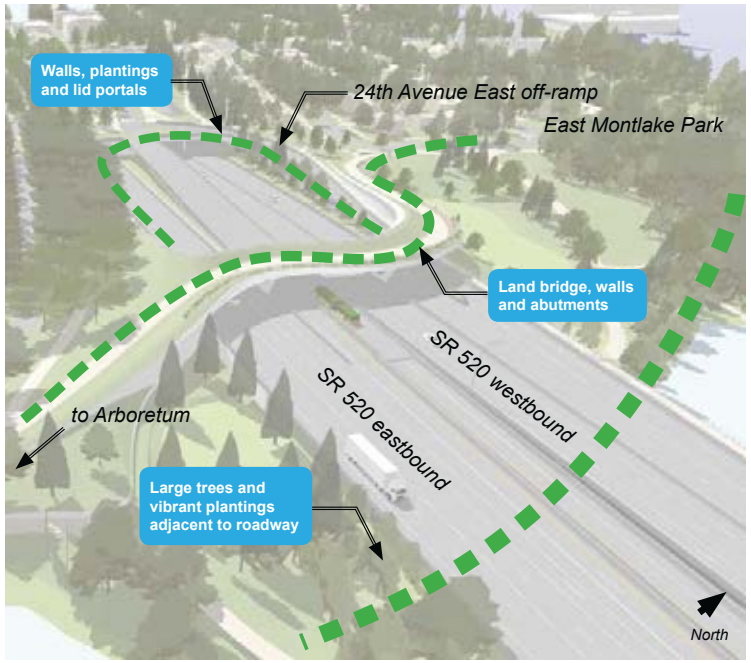
For those arriving from the east, the perception of entering Seattle begins with views from the West Approach Bridge of adjacent landscape at the Arboretum and East Montlake Park. Moving closer, these features merge into landscape walls, which become the land bridge abutments. The abutments then meld into highway walls, which join together at the tunnel portals.

- Design gateway elements as an integrated, continuous sequence of physical elements that together create a memorable gateway experience that clearly express the project vision of "Nature meets City."

Design requirements and challenges

Although the concept of a gateway into a city has evolved over time to become more symbolic than functional, it is still an actual physical experience. Rather than a single threshold, such as a traditional city gate or a tunnel portal into a steep hillside, the SR 520 gateway sequence consists of passing by and through a series of spaces and structures. Design of the sequence should incorporate "elements of continuity and elements of distinction" as articulated in the 2012 SCDP report. Although the SR 520 gateway sequence is primarily focused on vehicular traffic, consideration should also be given to users of the adjacent regional shared-use path.

Large trees and a vibrant natural landscape are visible on both sides of the SR 520 mainline, creating a "green gateway."



The east "gateway" into Seattle consists of passing through a sequence of spaces and structures.

Design recommendations

Land bridge

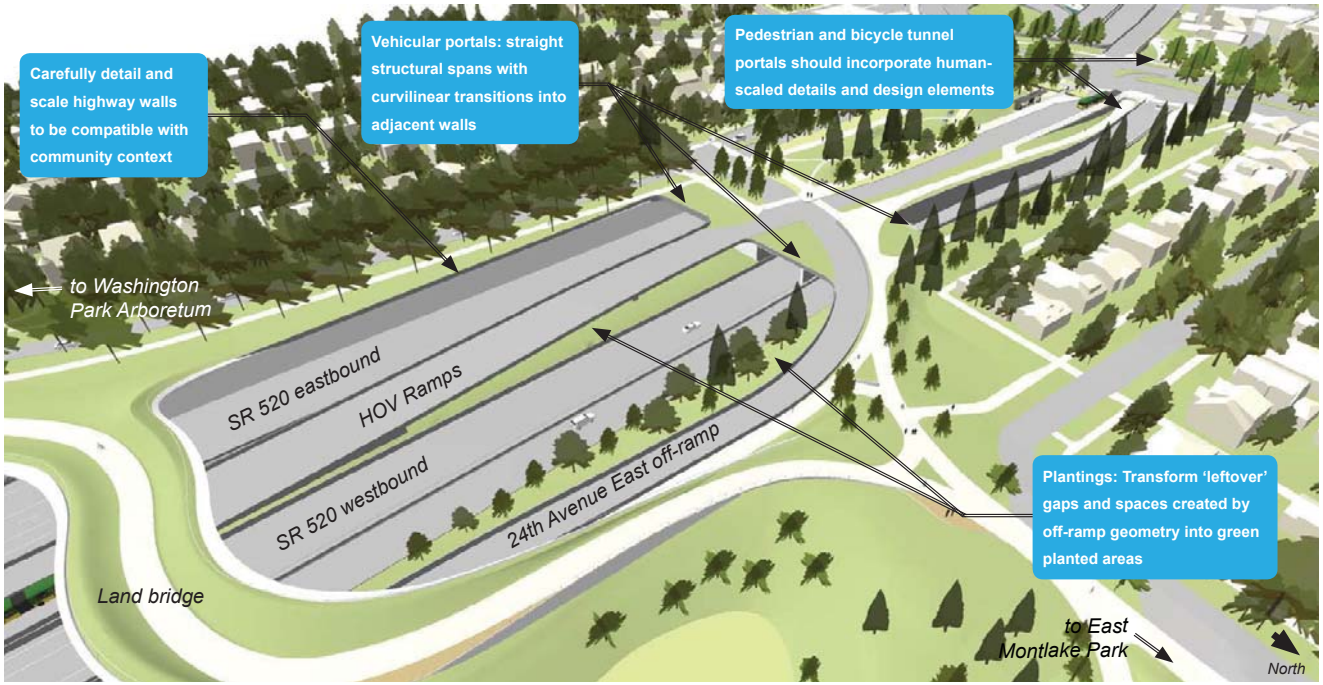
- The land bridge should unify all other east gateway elements. See the land bridge section (pp. 90-93) for design intent.

Adjacent landscape

- The most prominent elements of the "green" gateway are large trees. Maintain space adjacent to the SR 520 mainline so that trees and other vegetation in the stormwater treatment areas are visible from the roadway.
- Ensure that vegetation appears to be continuous, rising up and onto the land bridge from a driver's perspective.

Portals for vehicles

- The shapes of the vehicle portals should balance constructability with the overall design goals.
- Structural spans can be straight yet echo the land bridge geometry with curvilinear transitions into adjacent walls.
- At the east portal, entry into the tunnel should be preceded by landscape plantings at the roadway level in spaces created by the off-ramps. The project should look to similar strategies used successfully throughout the I-90 Mercer lid area.



View of the east portal area looking southwest.

Portals for pedestrians and cyclists

See the Undercrossings section (pp. 88-89) for related design intent items.

- Portals for the pedestrian and bicycle tunnels should not be identical to those designed for vehicles but should instead be human-scaled and use criteria specific to creating a comfortable pedestrian experience when passing below street level. As noted in the 2011 *SR 520 Bridge Architectural Design Principles*, "*Pedestrians and cyclists will also be much closer to the bridge features; this proximity presents opportunities for smaller-scale features with an increased level of detail along the regional path, compared to the features most notable by transit and vehicular users.*"
- These portals will also integrate railings and traffic barriers at the sidewalk level. Railing systems should work systematically with the portal architecture and support requirements for safety and visibility.

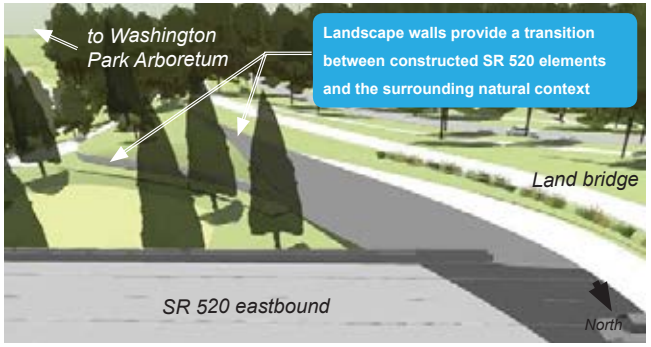
Walls

- Account for the dual nature of highway walls in developing aesthetic treatment and construction concepts. The walls are an important gateway element for drivers entering Seattle, and they also transition into a safety barrier at street level, therefore affecting the experience on the lid and East Lake Washington Boulevard.
- Between the abutment and the tunnel, portal surfaces should be consistent and of systematic construction with minimal distraction to drivers. At the same time, contrasts of light and dark, shade and shadow, and the use of pattern, line and texture can be considered at the appropriate scale to, "*add elegance to features that will give the corridor consistency, rhythm…and punctuate this rapid experience without being so frequent as to create a strobe-like effect*" and "*create a sense of rhythm, draws the eye forward along the road, and avoids jarring, distracting patterns*," consistent with WSDOT's *SR 520 Bridge Architectural Design Principles*.

"Consider the Montlake lid as part of this series of thresholds and clarify how it fits within that context. The sequence of the land bridge and tunnel should work together to create this threshold experience. Consider materiality, movement through the tunnel, and the moment of emerging from under a structure to see Foster Island or Portage Bay. "

- Memorandum: Recommendations for the Portage Bay Bridge and Montlake Lid components of the SR 520 Replacement Project

Seattle Design Commission, September 17, 2014



Landscape walls transition seamlessly into retaining walls and bridge abutments where the land bridge meets the adjacent landscape (view at south landing where the land bridge transitions into the Arboretum North Entry area).

Design resources

- SR 520 Eastside Urban Design Criteria (2010)
- SR 520 West Side Corridor Design Principles (2011)
- SR 520 Bridge Architectural Design Principles (2011)

GATHERING PLACES

Description

Gathering places occur at various locations throughout the project area that are not primarily focused on providing non-motorized circulation. These places include viewpoints, “pause points” along Montlake Boulevard East, transit stop areas, and a small plaza around the Montlake lid mobility hub that serves as an “Urban Trailhead.”

Location

- Montlake lid area
- Viewpoints along the land bridge pathway
- Transit stops along Montlake Boulevard East and at the SR 520 HOV on- and off-ramps
- Pause points along Montlake Boulevard East

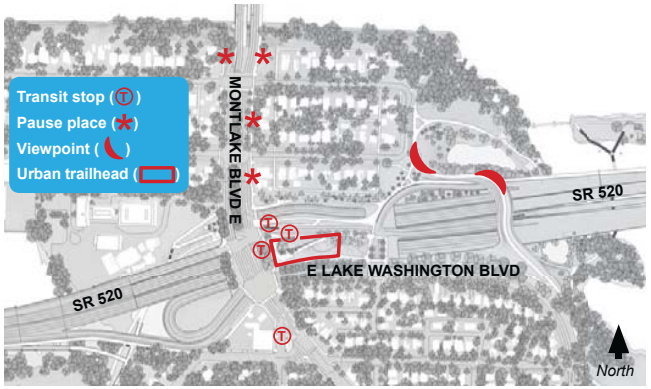
Performance outcomes

- Design safe and functional spaces that attract users and encourage positive activity.
- Design and program the lid just east of Montlake Boulevard East to serve as an “Urban Trailhead” mobility hub, helping visitors to discover, connect, and find places to explore in the surrounding parks and neighborhoods.
- Provide multiple opportunities for visitors to pause and rest, converse, or enjoy views throughout project area without impeding those who are moving along adjacent trails or sidewalks.
- Ensure that public places feel safe and active, with visitors and neighbors providing “eyes on the street.”

Design recommendations

- Provide sidewalk and trail users with spaces of adequate size to pull off or step out of circulation areas to avoid impeding passage of other users.
- Keep site furnishings, vegetation, or other obstructions clear of circulation areas (sidewalks, paths, cycle tracks, etc.).
- Provide seating opportunities at gathering places that allow for people sitting alone or in groups.
- Design gathering spaces that are sensitive to the neighborhood context, providing appropriate distance or screening from nearby residences.
- Coordinate with vegetation design at viewpoints to avoid planting vegetation that will grow in to block key views.

Location key



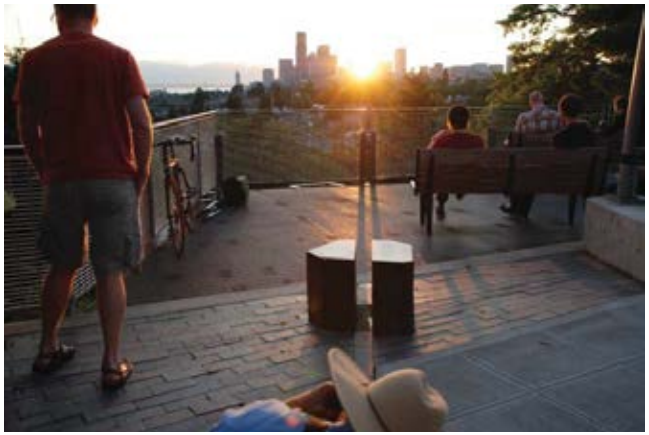
A conceptual rendering of a streetside “pause point” that provides a space for non-motorized users to step or pull out of the sidewalk or pathway to rest, wait, or meet. Locations and responsibility for the design and maintenance of such pause points remain to be determined through future planning and design.

Precedents

A gathering space with pedestrian amenities at the sidewalk near a crosswalk area along Winslow Way on Bainbridge Island. (Source: SvR Design Company)

A transit area and gathering space along the street on Northeast Campus Parkway near the University of Washington in Seattle. (Source: SvR Design Company)

A small plaza serving transit users near King Street Station in Seattle. (Source: Google Maps)



The Mt. Baker Ridge Viewpoint in Seattle provides a resting spot and opportunity to enjoy views and socialize. (Source: SvR Design Company)

Life cycle considerations

- Select furnishings and materials such as specialty paving that align with anticipated levels of maintenance.
- Develop a Memorandum of Understanding with other agencies, institutions, or private businesses for the operation and maintenance of potential facilities on the site (such as a bicycle share station, coffee stand, informational or wayfinding kiosk, etc).

Design resources

- Seattle Right-of-Way Improvements Manual (ROWIM)
  - » Chapter 4 – Design Criteria: Street Trees and Landscape Architectural Standards (4.14), http://www.seattle.gov/transportation/rowmanual/manual/4_14.asp
  - » Chapter 4 – Design Criteria: Transit Zones (4.25), http://www.seattle.gov/transportation/rowmanual/manual/4_25.asp
  - » Chapter 4 – Design Criteria: Street Furniture, Public Art and Unique Objects in the Public Right-of-Way (4.26), http://www.seattle.gov/transportation/rowmanual/manual/4_26.asp
- Crime Prevention Through Environmental Design (CPTED) guidance:
  - » Seattle Police Dept.: http://www.seattle.gov/police/prevention/neighborhood/cpted.htm
  - » Portland, OR: http://www.portlandoregon.gov/oni/article/320548
- General principles of Olmsted design: http://www.olmsted.org/the-olmsted-legacy/olmsted-theory-and-design-principles/seven-s-of-olmsteds-design
- Seattle Pedestrian Master Plan
  - » http://www.seattle.gov/transportation/pedestrian_masterplan/

STORMWATER

Description

Stormwater runoff from urban areas contains pollutants that are harmful to natural ecosystems and aquatic life. Treatment wetlands provide an enhanced level of treatment for runoff by removing a higher volume of dissolved metals. Treatment wetlands (including a concrete-lined presettling pool or vault, if required due to groundwater or space constraints) will be used to treat highway runoff from SR 520.

Bioretention cells are shallow depressions that contain engineered soil with plantings, which remove pollutants as water infiltrates downward. Plants in the bioretention cell help to maintain the soil media and enhance the visual experience of the facility. Biofiltration swales remove pollutants by slowing water with vegetation and allowing the pollutants to settle or be filtered out. Bioretention cells and biofiltration swales provide various levels of treatment that are appropriate for low- and moderate-volume roads. Bioretention or biofiltration could be used along roadways in the project area to help treat non-highway stormwater runoff where technically feasible.

Location

Planned treatment wetland locations include:

- East Montlake Park, just north of SR 520
- South of SR 520, just east of the land bridge landing
- South of SR 520, west of Montlake Boulevard East and adjacent to the SR 520 eastbound general purpose on-ramps

Bioretention locations to be considered further include:

- Along Montlake Boulevard East north of SR 520, as space, design advancement, and geotechnical factors permit
- Other roadways or surfaces, such as lid surfaces, as appropriate for bioretention

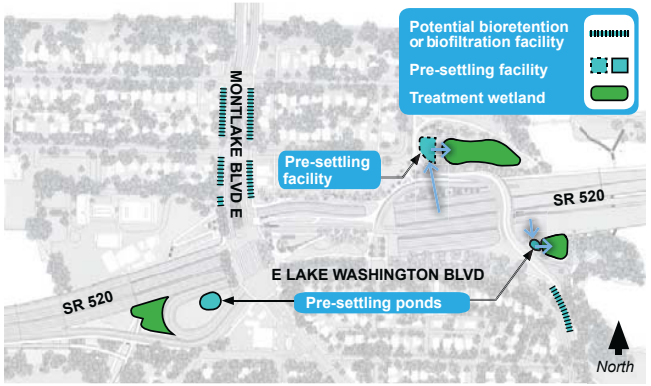
Performance outcomes

- Stormwater from highway and other lower-traffic roadways is effectively treated per applicable standards.
- Natural assets of the adjacent open spaces are reflected and accented by treatment wetland and bioretention features.
- Park and open space areas and views adjacent to the highway are unobstructed by stormwater infrastructure.
- Stormwater facilities blend aesthetically with their surroundings.
- Groundwater recharge occurs through infiltrating green stormwater infrastructure, where technically feasible.
- Stormwater runoff collection and conveyance meets applicable standards.

Design recommendations

- Distribute treatment areas for the West Approach Bridge North, the West Approach Bridge South, and the Montlake lid to utilize areas available on both the north and south sides of SR 520.
- Reflect and accent the natural assets of the adjacent open spaces with constructed wetland and bioretention or biofiltration features.
- Separate stormwater runoff from non-pollution-generating areas where feasible to limit facility size.
- Evaluate opportunities to distribute bioretention cells and/or biofiltration swales along low- and moderate-volume roads.
- Cover the pre-settling cell in East Montlake Park (north of SR 520) in a vault to increase the area available for other landscape elements and to better integrate the treatment facility into the park's landscape.
- Maintain a saturated wetland condition in treatment wetlands for the majority of the year to support wetland habitat.
- Achieve gravity conveyance of stormwater where feasible. Where gravity conveyance of stormwater is not feasible, pumping will be required.

Location key



Precedents

Stormwater wetlands though which users can walk, jog and bike in Seattle's Magnuson Park. (Source: Berger Partnership)

Rain gardens at High Point in Seattle. (Source: SvR Design Company)

The Alewife Wetlands in Cambridge, MA. (Source: Kleinfelder)

A roadside bioretention area in Seattle's Eastlake neighborhood. (Source: SvR Design Company)

Life cycle considerations

- Pre-settling cells, wetland cell outlet controls, and pump stations require access for routine maintenance.
- Pre-settling cells require periodic cleaning to remove accumulated sediment and debris.
- Wetland cells should be monitored for noxious weeds and Crime Prevention Through Environmental Design (CPTED) considerations, which may necessitate additional maintenance.

Design resources

- Seattle Right-of-Way Improvement Manual (ROWIM) http://www.seattle.gov/transportation/rowmanual/manual/
- City of Seattle, Stormwater Manual, Volume 3, 2009
- Washington State Department of Transportation, Final Environmental Impact Statement, SR 520 Bridge Replacement and HOV Program, 2011
- Washington State Department of Transportation, Highway Runoff Manual, 2014

OLMSTED LEGACY AND SECTION 106 COMMITMENTS

Description

The SR 520 corridor west side project has, through the National Environmental Policy Act (NEPA) process and Final Environmental Impact Statement (FEIS), developed a series of project commitments, including those developed under the U.S. Department of the Interior's National Historic Preservation Act, Section 106. Section 106 commitments have informed the urban design approach for the SR 520 corridor west side project. Awareness of and sensitivity to the legacy of the Olmsted brothers' work in Seattle in the early part of the 20th century, and summarized in the 1909 *Seattle Parks and Boulevards Plan* (see p. 19), has guided the project's vision, design explorations, and recommendations.

The 2006 Seattle Parks Foundation's *Bands of Green* plan provided an update to the Olmsted concept of connecting Seattle's "emerald necklace" of green space by identifying opportunities to eliminate gaps in the network of parks and boulevards. The SR 520 project seeks to continue this legacy by reestablishing pedestrian, bicycle and ecological connections that strengthen the overall green network.

Several elements within the west side SR 520 project area constitute key pieces of this "parks and parkways" network identified in the 1909 plan, including East Lake Washington Boulevard, Montlake Boulevard East, the Washington Park Arboretum, and Delmar Drive East.

Locations

- Montlake lid area
- Montlake Boulevard East
- East Lake Washington Boulevard
- Canal Reserve area
- Land bridge
- 10th and Delmar lid area
- Delmar Drive East

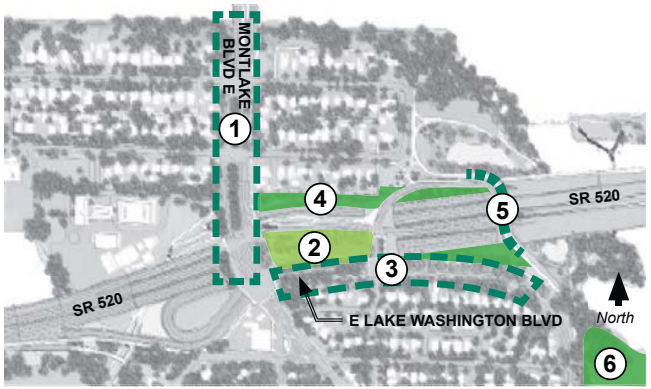
Project commitments

Project commitments address a series of urban design and landscape architecture elements. They are summarized in Appendix F and fully detailed in the *SR 520 Record of Decision - Attachment 1 Section 106 Programmatic Agreement*.

Montlake interchange

- To the maximum extent practicable, ensure that changes to East Lake Washington Boulevard are consistent with the city of Seattle's Olmsted park furniture standards and follow the Secretary of the Interior's Standards for the Treatment of Historic Properties.
- Ensure that the portion of the Montlake Boulevard East median to be partially removed is reestablished such that it retains the Olmsted plan to the maximum extent practicable.
- Within the area of Montlake Boulevard East for which median modifications are planned, consult on design, wording, and placement of a sign about the Alaska-Yukon-Pacific Exposition and the Olmsted design for this portion of Montlake Boulevard East.
- Consult to determine whether Seattle's Department of Parks and Recreation would be willing to have a sign or some other indicator of the significance of East Lake Washington Boulevard as an Olmsted property placed on the small piece of Seattle Parks and Recreation property at the southeast corner of Montlake Boulevard East and East Lake Washington Boulevard. If the Seattle Department of Parks and Recreation is willing to accept this proposal, consult to design the sign or other marker and have it fabricated and installed on the Seattle Parks and Recreation property.

Location key

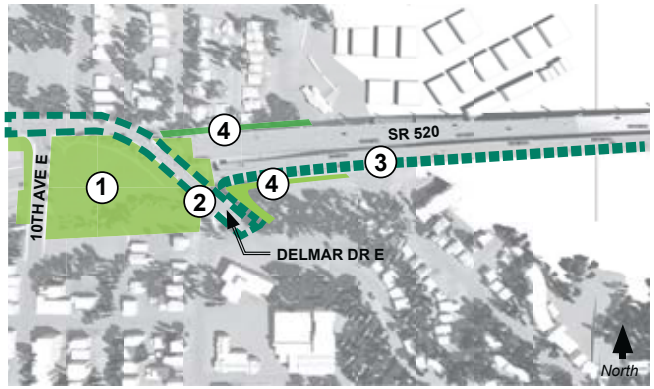


Montlake area *with 1 - Montlake Boulevard East, 2 - Montlake lid, 3 - East Lake Washington Boulevard, 4 - Canal Reserve, 5 - Land bridge, 6 - Washington Park Arboretum*

Montlake lid

- Consult to create a landscape design plan for the Montlake lid that is compatible with the historic character of the Montlake Historic District. This plan will include plantings and urban design elements, possibly including median and planter strip design, interpretive signage, and bus shelter design.
- Include interpretive exhibits and markers in the lid design if the design process identifies such exhibits or markers as being desirable. If markers or exhibits are placed on the lid, they may include information about the evolution of the Olmsted landscape and the effects of SR 520 on that landscape.
- Ensure that the design of the Montlake Boulevard East planted areas across the lid reflect the historical connection between Montlake Boulevard East and East Lake Washington Boulevard; these planted areas should reflect the original design principles of East Lake Washington Boulevard and other Olmsted-designed boulevards in Seattle to the highest degree possible.

Location key



***Roanoke area** with 1 - 10th and Delmar lid, 2 - Delmar Drive East, 3 - Portage Bay Bridge shared-use path, 4 - Pedestrian stair and path connections*

- Consult on a design to reestablish a visual buffer on or adjacent to the remaining Canal Reserve lands south of the historic properties on East Hamlin Street.
- Consult on the development of a signage plan for historic markers or signs for the Montlake Historic District. Once the signage plan is approved, fund fabrication and installation of up to five historic markers or signs within the district.

Bascule bridge

- Determine feasible ways to provide a buffer between Montlake Boulevard East and a new bascule bridge, and those historic properties that are adjacent to the boulevard and bridge.
- Ensure that the design for a new bascule bridge is compatible with the existing bridge and neither competes with nor replicates that bridge.

Portage Bay Bridge

- WSDOT is committed to a *Context-Sensitive Solutions* approach for the replacement of the Portage Bay Bridge.
- Consult on a design to include improved open space as part of the bridge design, making the space under the bridge usable while incorporating Crime Prevention Through Environmental Design (CPTED) principles to the maximum extent practicable.
- Connect the Bill Dawson Trail and the Ship Canal Waterside Trail via the Arboretum Waterfront Trail.
- Form a partnership to install appropriate retaining wall treatments and lighting along the Bill Dawson Trail that enhance the user experience and promote safety in areas directly affected by project construction.

Delmar Drive/10th Avenue lid and I-5 interchange

- This design will be compatible with the historic character of the Roanoke Park Historic District and other adjacent historic properties and consistent with the Secretary of the Interior's Standards for the Treatment of Historic Properties insofar as these are applicable.
- This plan may include provisions for some or all of the following:
  - Design, fabrication, and installation of interpretive markers describing the evolution of the Olmsted landscape and the effects of SR 520 on the landscape. If adopted as part of the design plan, exhibits may note that the lid reconnects communities and recovers the landscape connections that were historically significant within the landscape of Seattle.
  - Incorporate Olmsted characteristics, perhaps using the Seattle Olmsted Park Furniture Standards as guidelines for items such as benches or lighting, into the design of the lid and the Bagley viewpoint.
  - A context-sensitive design should allow the lid to blend gracefully into the hill slope to the south.
- Maintain as much mature vegetation as possible on all sides of the lid and consult with the Portage Bay/Roanoke Park and North Capitol Hill communities to identify and select plantings compatible with the historic character of the area to the maximum extent practicable.

Performance outcomes

Olmsted scholar Charles Beveridge outlines several key Olmsted goals for successful design. They comprise considerations of and design for: Scenery, Suitability, Style, Subordination, Separation, Sanitation and Service. These goals are reflected in the performance outcomes for the SR 520 project, including:

- Enhance or complement the user experience and appreciation of Olmsted legacy through project design.
- Connect and reinforce the system of boulevards and open spaces with consistent and memorable vegetation and materials.
- Encourage and increase multimodal use.
- Ensure that planting palettes are consistent with or complementary to Olmsted design.
- Reinforce Olmsted sustainability principles throughout the project.

Design recommendations

Design recommendations for ensuring adherence to Section 106 project commitments and respecting the legacy and goals of the Olmsted brothers' work in Seattle were developed in part from the Olmsted design principles identified by the National Association for Olmsted Parks (see *Seven principles of Olmsted design*, p. 102).

"Special efforts were made and heavy expenditures were required in carrying out our plan to have our north and south chain of boulevards along or overlooking Lake Washington from the Mount Baker district, north to the Exposition grounds, open for traffic, so that our Eastern visitors might enjoy the beauties of our lake and mountain scenery."

- from City of Seattle, Board of Park Commissioners, *Sixth Annual Report 67*, 1909, cited in *HistoryLink Essay* 8985

- Reflect and complement the historical footprint of the University Extension of Washington Park Boulevard in the connection between Montlake Boulevard East and East Lake Washington Boulevard, including the application of the Olmsted design principles in Montlake lid plantings.
- Use native plants where possible or ornamental vegetation that preserves, reflects or complements the Olmsted legacy and design principles.
- Develop interpretive signage where required or appropriate that documents the Olmsted legacy and the effects of the SR 520 project on that legacy.
- Enhance existing park and boulevard spaces as well as proposed open spaces through the use of views to borrowed landscape, such as Lake Washington, Mount Rainier and Portage Bay.
- Support and create spaces that are memorable, unified and context-sensitive.
- Encourage safe, intuitive and comfortable movements along, and to and from, SR 520 facilities.

Seven principles of Olmsted design

All text from the *National Association for Olmsted Parks.*

A GENIUS OF PLACE

The design should take advantage of unique characteristics of the site, even its disadvantages. The design should be developed and refined with intimate knowledge of the site.

UNIFIED COMPOSITION

All elements of the landscape design should be made subordinate to an overarching design purpose. The design should avoid decorative treatment of plantings and structures so that the landscape experience will ring organic and true.

ORCHESTRATION OF MOVEMENT

The composition should subtly direct movement through the landscape. There should be separation of ways, as in parks and parkways, for efficiency and amenity of movement, and to avoid collision or the apprehension of collision, between different kinds of traffic.

ORCHESTRATION OF USE

The composition should artfully insert a variety of uses into logical precincts, ensuring the best possible site for each use and preventing competition between uses.

SUSTAINABLE DESIGN/ENVIRONMENTAL CONSERVATION

The design should allow for long-term maintenance and ensure the realization and perpetuation of the design intent. Plant materials should thrive, be non-invasive, and require little maintenance. The design should conserve the natural features of the site to the greatest extent possible and provide for the continued ecological health of the area.

A COMPREHENSIVE APPROACH

The composition should be comprehensive and seek to have a healthful influence beyond its boundaries. In the same way, the design must acknowledge and take into consideration what surrounds it. It should create complimentary effects. When possible, public grounds should be connected by greenways and boulevards so as to extend and maximize park spaces.

(Source: http://www.olmsted.org/the-olmsted-legacy/olmsted-theory-and-design-principles/design-principles)

Life cycle considerations

- Specify site furnishings and materials that are context-sensitive, energy-saving, durable and easily maintained.
- Develop MOUs or agreements between appropriate agencies (e.g. WSDOT, Seattle Department of Transportation, Seattle Department of Parks and Recreation, University of Washington) for the maintenance of vegetation.

"The drive is not the primary purpose of the park. The park is a piece of landscape or a series of landscapes and the drive is merely the means of making these landscapes accessible and enjoyable by people in carriages and on foot."

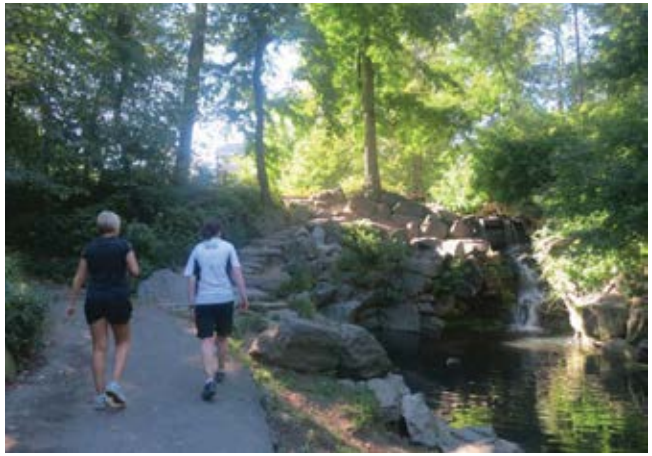
- from letter of John C. Olmsted to Board Commissioner Charles W. Saunders, 1904.
HistoryLink Essay 10243

Precedents

Connected green spaces and safe and comfortable pedestrian paths at Frederick Law Olmsted and Calvert Vaux's Prospect Park in New York City, NY.

Multimodal use, separation of users for safety, and access to water encourage healthy activities and access to nature at John Charles and Frederick Law Olmsted Jr.'s Green Lake Park in Seattle, WA. (Source: SvR Design Company)

Context-sensitive design that considers scale, unity, and materials at Frederick Law Olmsted and Calvert Vaux's Central Park in New York City, NY.



Ecological and recreational functions are enhanced at Frederick Law Olmsted and Calvert Vaux's Central Park in New York City, NY.

Design resources

- SR 520 Final Environmental Impact Statement (2011) http://www.wsdot.wa.gov/Projects/SR520Bridge/EIS.htm#FEIS
- SR 520 Record of Decision (2011) Section 106 Programmatic Agreement http://www.wsdot.wa.gov/NR/rdonlyres/82D6F3D8-FD6E-446F-B257-1923ABB658B7/0/520_ROD_Att1_ProgrammaticAgreement.pdf
- National Association for Olmsted Parks http://www.olmsted.org/
- Friends of Seattle's Olmsted Parks http://www.seattleolmsted.org/ See also "Seattle's Olmsted Landscape Heritage" Puget Soundings, April 1986 http://s3.amazonaws.com/olmsted/links/11/Puget_Soundings_April_1986.pdf?1405275762
- Seattle Parks Foundation Bands of Green https://www.seattleparksfoundation.org/file/2014/step-up/Bands-of-Green-Final-Plan-2007.pdf
- Lake Washington Boulevard Vegetation Management Plan http://www.seattle.gov/parks/horticulture/vmp/lakewashingtonblvd.htm
- WSDOT Context Sensitive Design http://www.wsdot.wa.gov/Design/Policy/CSDesign

VEGETATION

Description

The vegetation in the project area includes a number of different zones and planting types defined by varying physical, ecological and built conditions within the project area. These range from low, urban streetscape plantings with street trees to treeless dry meadow area to native Pacific Northwest coniferous forest. This section provides an overview of the major planting concept areas, indicating the locations in which they would be applied, general design intent, and a small sample of potential plant species for each.

Location

- Montlake Boulevard East planting areas
- Montlake lid area
- East Lake Washington Boulevard planting areas
- Highway buffer planting
- Stormwater treatment wetlands
- Land bridge
- Canal Reserve area

Performance outcomes

- Ecological connectivity between areas north and south of project area, such as the University of Washington Arboretum to the south and the Union Bay Natural Area to the north.
- Views into and out of non-motorized areas available throughout the project area to promote user safety and security.
- Well-established plantings maintained to provide the aesthetic and functional benefits expected by typical users.
- A user experience consistent with the Olmsted boulevard legacy along East Lake Washington Boulevard and Montlake Boulevard East.
- Appropriate transitions between connected vegetated areas of different types, such as between Olmsted boulevards and the land bridge or the Canal Reserve.

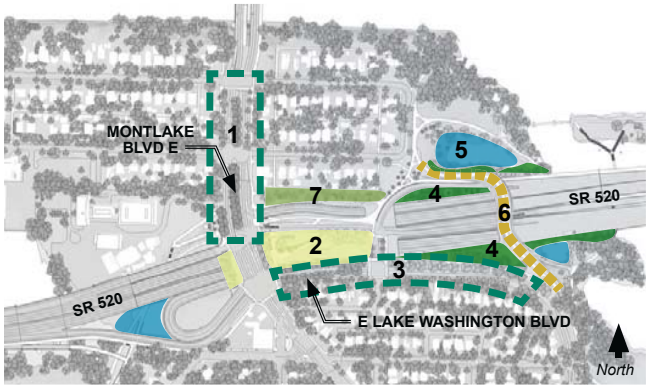
Design recommendations

- Select species and design layout of plantings to keep vegetation clear of circulation areas such as sidewalks, paths, and cycle tracks.
- Consider ease of maintenance when selecting plant species and designing plantings.
- Use native plants where possible; other plants should be well-adapted to our region's climate and any special planting conditions for their location, such as shallow soils or roadside conditions.
- Provide adequate soil volume for trees. Providing soil volume for trees on the lid may necessitate stormwater pumping for portions of the highway.
- Provide irrigation necessary for the establishment and continued health of vegetation.
- Locate the path through the Canal Reserve to allow for a grove of trees between the path and residential areas.
- Consider Crime Prevention Through Environmental Design (CPTED) principles in planting design.
- Provide screening where appropriate, but avoid creating large volumes of dense vegetation that could provide areas to hide or camp.
- Select and arrange plant species in ways that allow good visibility into and out of public spaces.

Life cycle considerations

- Consider maintenance needs for vegetated areas.
- Develop MOUs or agreements between appropriate agencies (e.g. WSDOT, Seattle Department of Transportation, Seattle Department of Parks and Recreation, University of Washington) for the maintenance of vegetation.

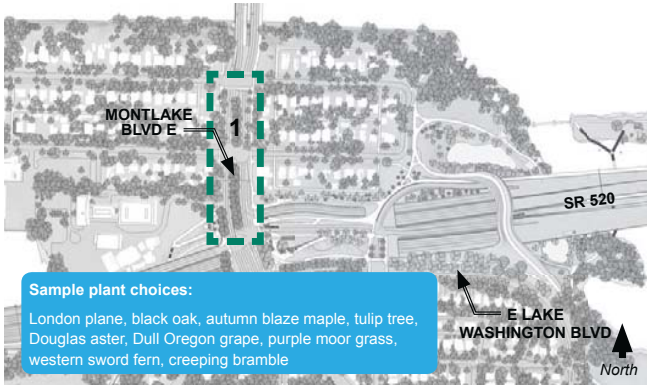
Location key



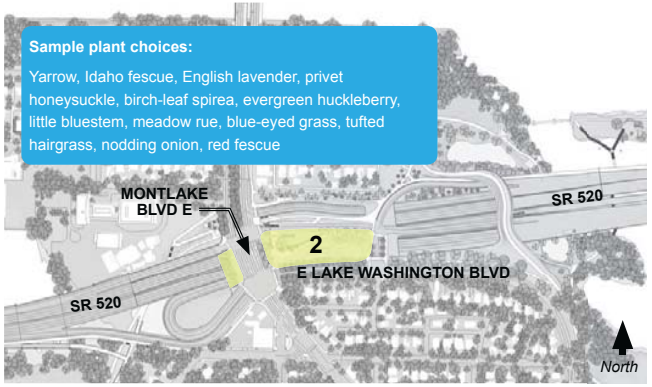
Design resources

- Seattle Right-of-Way Improvements Manual (ROWIM), Chapter 4 – Design Criteria: Street Trees and Landscape Architectural Standards (4.14) http://www.seattle.gov/transportation/rowmanual/manual/4_14.asp
- Seattle Department of Transportation's Street Tree List http://www.seattle.gov/transportation/docs/uf/2011-Street_Tree_List.pdf
- Lake Washington Boulevard Vegetation Management Plan (VMP) http://www.seattle.gov/parks/horticulture/vmp/lakewashingtonblvd.htm
- Washington, DC Department of Transportation – 2014 Green Infrastructure Standards guidance on minimum recommended soil volumes for trees http://ddot.dc.gov/sites/default/files/dc/sites/ddot/publication/attachments/2014-0421-DDOT%20Green%20Infrastructure%20Standards.pdf
- General principles of Olmsted design http://www.olmsted.org/the-olmsted-legacy/olmsted-theory-and-design-principles/seven-s-of-olmsteds-design
- WSDOT Roadside Manual Chapter 800: Vegetation, Chapter 810: Vegetation Restoration http://www.wsdot.wa.gov/Publications/Manuals/M25-30.htm
- CPTED guidance, Seattle Police Department http://www.seattle.gov/police/prevention/neighborhood/cpted.htm

Location key



1. Montlake Boulevard East: *Large street trees with low plantings (including native species) in character with an historic Olmsted boulevard.*



2. Plantings on lid: *Intensive green roof with deep soil base and trees.*

Precedents

Boulevard with mature tree canopy in Portland, OR. (Source: MAXfaqs blog)

Northwest meadow landscape in Seattle's Olympic Sculpture Park. (Source: Berger Partnership)

Location-specific design recommendations

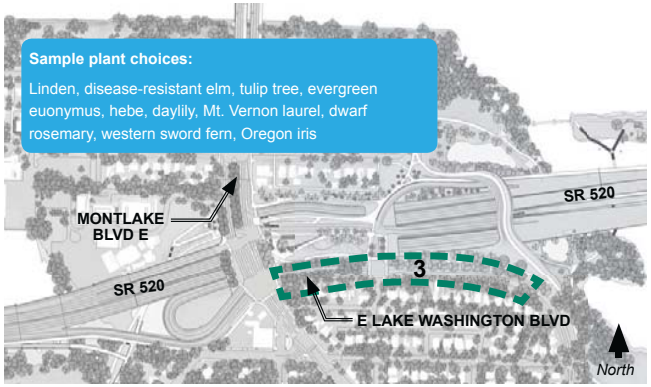
1. Montlake Boulevard East

- Reflect the historic character of Montlake Boulevard East as an Olmsted parks system boulevard.
- Select low shrubs and groundcover, combined with large trees appropriate to a boulevard.
- Maximize width of vegetated zones while providing adequate travel ways for motorized and non-motorized users.
- Include bioretention swales where possible; ensure bioretention plantings are compatible with historic character.
- Include evergreen plantings for year-round presence.
- Select plants with characteristics that provide year-round interest (such as flowers, fall color, seasonal scent, etc.).

2. Urban trailhead and Montlake lid

- Choose plantings at the urban trailhead (near the west end of the lid, on east side of Montlake Boulevard East) that are compatible with an area that serves as a vibrant, multi-modal urban hub joining two historic Olmsted boulevards.
- Include medium-to-large tree species on this area of the lid, which will include soils up to six feet in depth for robust plantings in some areas. Deeper soils will require a deeper lid structure, the potential lowering of the highway for adequate clearance and may necessitate the pumping of stormwater.
- Include evergreen plantings for year-round presence.
- Select plants with characteristics that provide year-round interest (such as flowers, fall color, seasonal scent, etc.).
- Incorporate a gradation in vegetation type, from native meadow at the land bridge end of the lid to a more cultivated expression around the urban trailhead area.

Location key



3. East Lake Washington Boulevard: *Grand trees and low, diverse vegetation along the historic Olmsted boulevard serve as a gateway to the Washington Park Arboretum.*

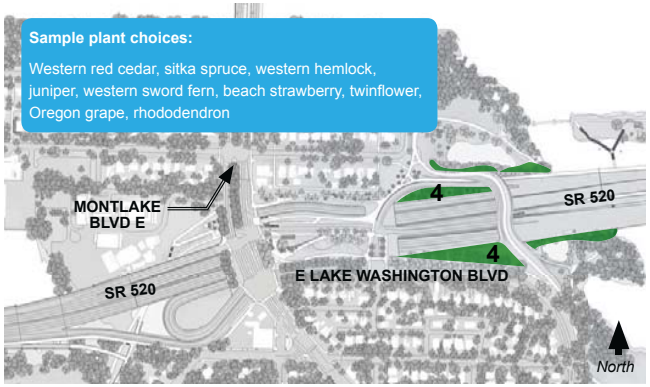
Precedents

Planted median and streetscape with mature trees in Odessa, Ukraine. (Source: OddessaApts.com)

Location-specific design recommendations

3. East Lake Washington Boulevard

- Reflect the historic character of East Lake Washington Boulevard as an Olmsted parks system boulevard.
- Select low shrubs and groundcover combined with large trees appropriate to a boulevard.
- Select trees that will provide a broad overhead canopy along the boulevard when they mature. Select species that complement existing mature trees along the boulevard.
- Include evergreen plantings for year-round presence.
- Preserve existing and healthy mature trees where possible.
- Coordinate design work with SDOT's landscape architect.
- Refer to Seattle's Department of Parks and Recreation's *Vegetation Management Plan* (VMP) for Lake Washington Boulevard.



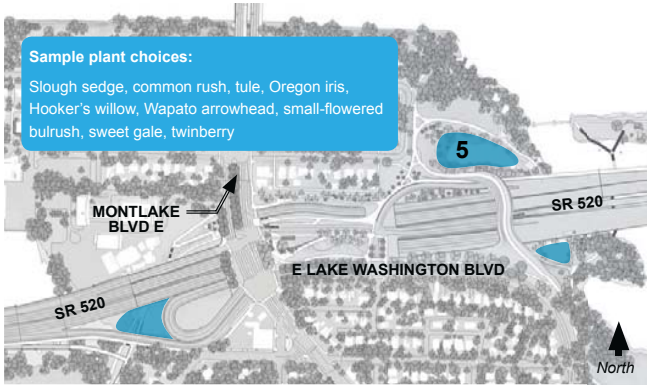
4. Highway buffer planting: *Dense, evergreen tree and shrub planting will screen traffic, reduce noise, and provide views of vegetation for drivers on the highway.*

Dense evergreen freeway buffer planting at the I-90 portal on Mercer Island. (Source: Google Maps)

4. Highway buffer and gateway

- Provide visual screening in select areas between the highway infrastructure and surrounding neighborhoods.
- Select plantings that highlight Seattle's urban nature in the "gateway experience" of those traveling into or out of the city, reinforcing the SR 520 west side vision of "Nature meets City."
- Include a variety of hardy and robust evergreen tree and shrub species.
- Include native plant species.

Location key



5. Stormwater wetlands: *Plantings should be able to withstand periods of drought and stormwater inundation.*

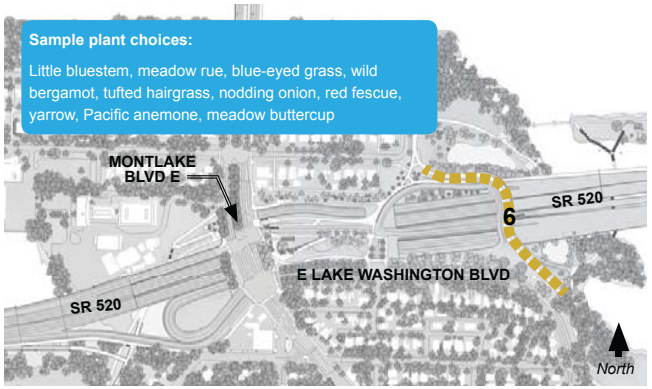
Precedents

The grounds at Stafford Hospital in Stafford, VA. (Source: Amy Umble)

Location-specific design recommendations

5. Stormwater wetlands

- Include plantings adapted to multiple wetland zones (from fully saturated to moist edges and above).
- Include evergreen species.
- Include native plant species.
- Select several key species to provide character and visual impact.
- Select plantings that blend the wetland area seamlessly into the surrounding park and/or highway buffer vegetation.



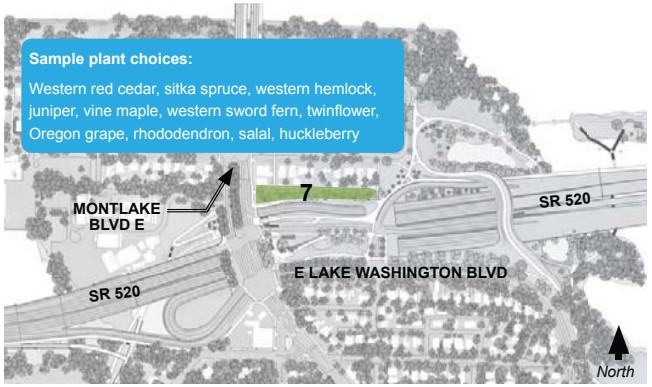
6. Land bridge meadow: *An extensive green roof system with a shallow soil base supports meadow and prairie plantings.*

The High Line in New York City. (Source: Friends of the High Line)

6. Land bridge meadow

- Select plant species compatible with the thin soil profile of the land bridge.
- Select plantings to create a "dry meadow" or prairie-type ecosystem, including grasses, low perennials and forbs.
- Select native or non-invasive, climate-adapted species.
- Select plants that are maintainable by periodic mowing/trimming.
- Consider plants to provide year-round interest (such as flowers, fall color, persistent seed heads, etc.).
- Select plants with characteristics that provide year-round interest (such as flowers, fall color, seasonal scent, etc.).

Location key



7. Canal Reserve: *Grand trees and screening understory vegetation are located between the SR 520 Montlake lid and the adjacent Shelby/Hamlin neighborhood.*

Precedents

A forest pathway in Seattle's Volunteer Park is lined with mature trees and some low vegetation for screening similar to that envisioned for the Canal Reserve. (Source: Ed Porras, Flickr)

Location-specific design recommendations

7. Canal Reserve

- Screen views of the highway from the Shelby/Hamlin area to the north.
- Consider Crime Prevention Through Environmental Design (CPTED) principles when designing plantings.
- Select shrubs, groundcover and large tree species appropriate to a forested urban public open space.
- Consider the city of Seattle's tree canopy goals.
- Use native plants where possible and non-natives or ornamentals where appropriate.
- Include evergreen trees and other plantings for year-round presence.
- Preserve existing and healthy mature trees where possible.
- Design plantings that relate to and help create a connected urban green space along SR 520, from the area around the stormwater facility at East Montlake Park into and through the Canal Reserve.

APPENDIX B

NON-MOTORIZED CONNECTIVITY TECHNICAL WHITE PAPER

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SR 520 and City of Seattle

Non-Motorized Connectivity Technical White Paper

November 2014

FINAL

Lead Author: Parametrix

Contributing Authors: VIA Architecture
SvR
City of Seattle

Washington State Department of Transportation

City of Seattle

Washington State Department of Transportation

City of Seattle

SR 520 and City of Seattle Non-motorized Connectivity Technical White Paper

Introduction

Per the direction of the legislature under the auspices of ESSB 6001 in April 2014, the Washington State Department of Transportation (WSDOT) teamed with the city of Seattle and other design professionals, including the Seattle Design Commission (SDC), in a series of workshops throughout the summer of 2014 to advance the design of the unfunded elements of the SR 520 corridor. The workshops were based on the design refinements resulting from the 2012 Seattle Community Design Process (SCDP) and sought to address the unresolved design areas as outlined in the City Council Resolution 31427. The team focused on three key elements for further study: the network of non-motorized and transit connectivity, the Portage Bay Bridge and the Montlake lid area. Together the group developed a series of recommendations, and where additional study is still required, they identified design considerations or future concepts.

During the 2012 SCDP, WSDOT and the city of Seattle heard significant stakeholder and public feedback to enhance the non-motorized connections to and through the SR 520 corridor and in response developed a series of design preferences that reflected this feedback. A work group made up of city of Seattle and WSDOT technical staff were directed to recommend compelling non-motorized connections that improve mobility, safety, comfort and traffic conditions in and around the SR 520 corridor. Their recommendations are summarized in this document, the *SR 520 and City of Seattle Non-motorized Connectivity Technical White Paper.*

Purpose

This technical white paper outlines specific recommendations for non-motorized connections within the WSDOT SR 520 project on the west side and where those facilities transition to the city of Seattle bicycle, pedestrian, and transit network. Where possible, the document identifies agency responsibility for feasibility, coordination, design or funding. It also includes recommendations for possible additions to the 2014 city of *Seattle Bicycle Master Plan*, where these proposed improvements interface with SR 520 facilities. This will require further coordination and analysis by the Seattle Department of Transportation (SDOT). Ultimately, this technical white paper will provide a blue print for future SR 520 non-motorized planning and design work when funding is received and serve as the basis for developing guiding design principles to ensure best practices for non-motorized connections.

What informed the work

The work group discussed the SR 520 regional shared-use path (RSUP), which extends across Lake Washington, and its role in not only providing new transportation and mobility choices, but of uniting the east side of Lake Washington to downtown Seattle, as well as providing access to transit and connections to other bicycle facilities, the neighborhoods north and south of the Montlake Cut, and major centers like the University of Washington and the new University Link Light Rail line. With this assumption, the group also considered the following as a basis for their recommendations:

The vision, design preferences, and unresolved design decisions from Seattle Community Design Process (SCDP) were the starting platform that informed the content and direction of the non-motorized connectivity workshops in 2014. The group also considered a number of other important documents, projects and public processes a basis for their recommendations (see sidebar *Relevant Resources and Projects*).

Goals

Based on ongoing public input, previous WSDOT and design team explorations, and city of Seattle non-motorized priorities, the following design goals were established to guide the development of the work group's recommendations for the SR 520 project corridor:

Access and mobility

- **Mobility between and through neighborhoods** with various travel modes and convenient routes.
- **Access for all levels, abilities and needs** through best practices and compliance with Americans with Disability Act (ADA) requirements.
- **Capacity for current and future non-motorized traffic volumes.**

Health and safety

- **Safe and interesting cycling and walking routes** to attract diverse users with varying skill and confidence levels for recreation and health.
- Promotion of **traffic-calming and reduction of potential conflicts** among cyclists, pedestrians and vehicles using path separation, route widening, and safe and distinctive surfacing, as well raised crosswalks, effective signalization and/or signage.
- Promotion of **commute-trip reduction, reduced congestion and reduction of greenhouse gas** emissions by providing connections to transit, and more and improved bicycle and pedestrian facilities.

Character and clarity

- Build connections to and through green and blue (waterways) open space networks that can support multiple uses.
- Use paths to **activate open spaces and lids** as well as to create **easy connections to activity centers**, such as schools, transit, parks and open spaces, and neighborhoods.
- Develop **clear and intuitive wayfinding** to promote cycling and walking as everyday means of travel.

RELEVANT RESOURCES AND PROJECTS

2012 Seattle Community Design Process
For more information about the SCDP see the 2012 SCDP Final Report online here *[Seattle Community Design Process Final Report]*. Pages 21 to 27 outline refinements to the non-motorized connections.

Other WSDOT Documents
Washington State Bicycle Facilities and Pedestrian Walkways Plan (2008), *SR 520 Final Environmental Impact Statement* (2011)

Existing city of Seattle Master Plans
Bicycle Master Plan (2014), *Bicycle Implementation Plan* (2014), *Pedestrian Master Plan* (2009), *Transit Master Plan* (2012), *Complete Streets Program*, *Bands of Green Plan* (2007), *Washington Park Arboretum Master Plan* (2002)

Other references
NAACTO Urban Bikeway Design Guide (2014), *University of Washington Campus Master Plan* (2003), *University of Washington Campus Landscape Framework* (2014)

Other projects underway
23rd Avenue Corridor Improvements Project, Burke Gilman Trail improvements, Sound Transit UW Light Rail Station , University of Washington Rainier Vista Project and *Washington Park Arboretum Multi-use Trail Project*

SR 520 and City of Seattle Non-motorized Connectivity Technical White Paper

Summary of Major Recommendations

The work group identified a series of recommendations for the major focus areas within the SR 520 project corridor, as well as additional considerations where design concepts remain unresolved. These recommendations include bicycle and pedestrian paths within the SR 520 project corridor that enhance the connections and transitions between the new SR 520 regional shared-use path (RSUP) and other regional centers, as well as existing and planned city of Seattle bicycle, pedestrian and transit networks. Ownership and/or oversight of specific non-motorized facilities are delineated by color. State facilities are indicated in orange, City facilities in yellow, mixed oversight in orange with yellow and University of Washington facilities in purple.

1 Provide an accessible non-motorized path on the south side of Portage Bay Bridge that completes the Regional Shared-Use Path (RSUP) from Eastside communities to I-5 in Seattle.

8 Create new, safe and comfortable undercrossing at 10th Avenue East connecting 10th and Delmar lid shared-use path to Broadway Avenue East and Harvard Avenue East neighborhood greenway to downtown Seattle.

12 Design architecturally-integrated at-grade and separated connections to and from the shared-use path on the Portage Bay Bridge to provide safe, intuitive and comfortable options for pedestrians and cyclists.

16 Straighten and widen Bill Dawson trail alignment for improved comfort, safety and sightlines with separation of cyclists and pedestrians using distinctive surfacing.

19 Create a new undercrossing at Montlake Boulevard East for safe pedestrian and bicycle crossing and connection of RSUP from urban trailhead/mobility hub to Bill Dawson Trail and Portage Bay Bridge with separation of cyclists and pedestrians using distinctive surfacing.

21 **21** Provide raised crosswalks or distinctive surface treatments at crossings to improve wayfinding, enhance bicycle and pedestrian safety, provide vehicle traffic calming and reinforce the Olmsted boulevard character.

22 Coordinate on a University of Washington-developed waterfront recreational trail to provide bicycle and pedestrian access along Portage Bay and Montlake Cut with connections under Montlake Boulevard to Walla Walla Lane.

25 Shorten pedestrian crossings by narrowing lanes and the eliminating free vehicle movements with signalized intersections to enhance safety, comfort and traffic-calming.

26 Improve pedestrian experience at interchange over SR 520 mainline by widening path on both sides of Montlake Boulevard and enhancing portal edge on west side with buffered plantings along path edges.

27 Continue ongoing refinement of proposed improvements to connections along the west side of Montlake Boulevard. If existing constraints change in the future, WSDOT and city of Seattle will pursue other opportunities to further improve conditions for pedestrians and cyclists.

31 Develop a safe, separated and direct multi-use connection from the Portage Bay Bridge along the north side of East Roanoke Street to Montlake Boulevard.

32 Reconfigure the intersection at East Roanoke Street and East Montlake Place for improved legibility and traffic-calming and a safer and more direct connection between Montlake neighborhood greenways.

35 Provide signed intersections at the 24th Avenue East off-ramp and at East Lake Washington Boulevard to enhance bicycle and pedestrian safety, provide vehicle traffic calming and reinforce the Olmsted boulevard character and neighborhood scale.

36 Create a new, non-motorized land bridge east of 24th Avenue East, which provides a quality, efficient and barrier-free north-south crossing over SR 520, safely connecting the Washington Park Arboretum, East Montlake Park and access to transit.

37 Develop a new undercrossing that extends the Arboretum Waterfront Trail under SR 520 at the Lake Washington shoreline and provides additional comfortable and safe pedestrian connections to the Arboretum.***

***NOTE:** The boardwalk alignment as illustrated in this report is one potential solution for this important pathway connection; specific landing points and layout are subject to further study by WSDOT and the city of Seattle.

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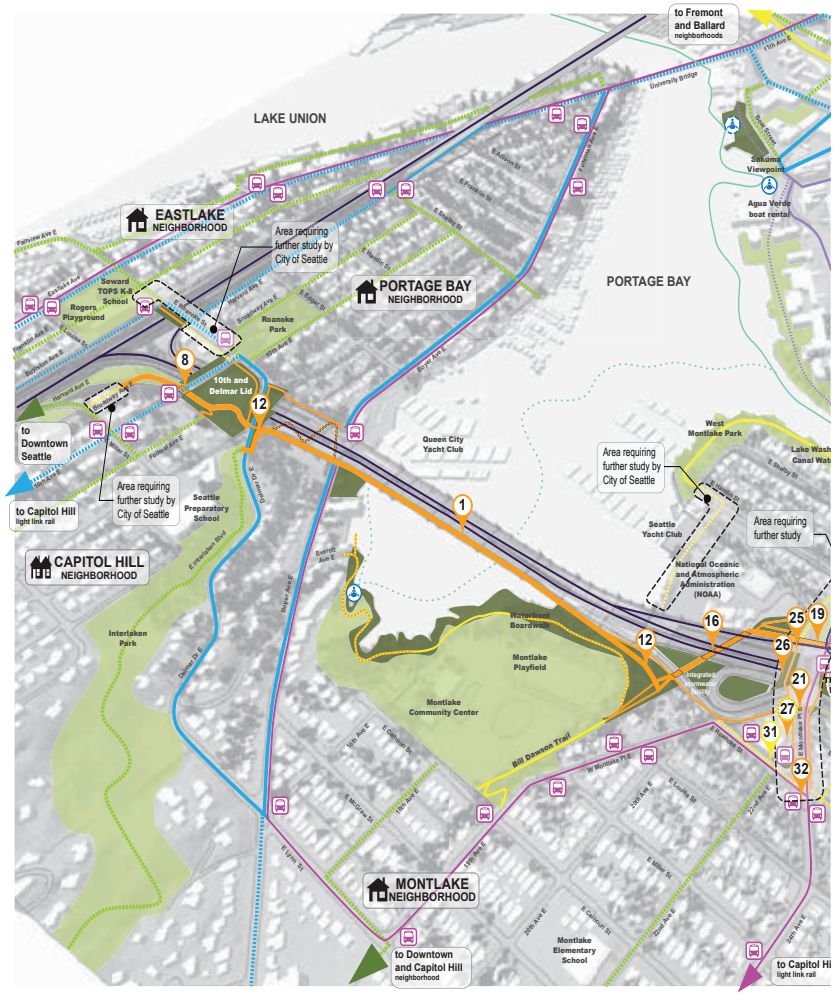
SR 520 and City of Seattle Non-motorized Connectivity Technical White Paper



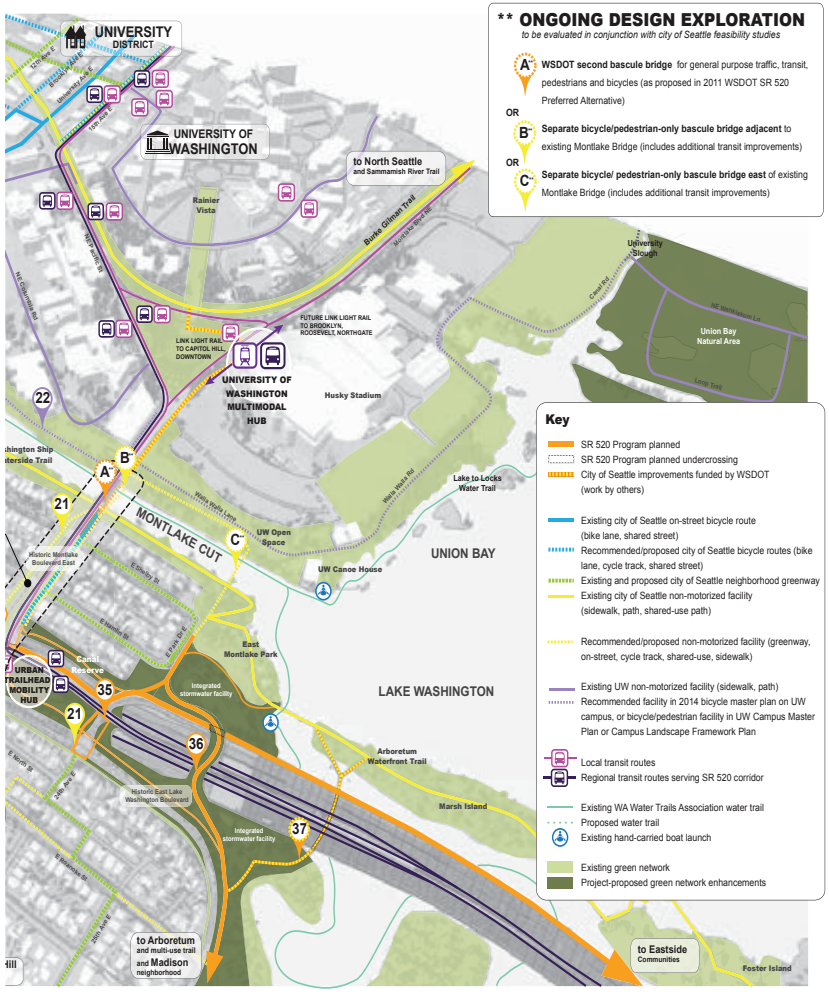


Figure 1 SR 520 and City of Seattle Non-motorized Connectivity Network

Recommendations and Additional Design Considerations by Geographic Area

The 2014 project recommendations and additional considerations are discussed by geographic area moving from the west portion of the SR 520 project to the east where the regional shared-use path (RSUP) meets the West Approach Bridge. Where consensus was not reached, and/or additional analysis is required, alternative design explorations are provided for future consideration.

The SR 520 and City of Seattle Non-motorized Connections Network: 2014 Design Refinements exhibit provides a visual, diagrammatic summary of the proposed recommendations and additional design considerations (See **Figure 1**). These recommendations are described in further detail below in narrative form and also summarized in an attached matrix. Recommendations are organized by four geographic areas--regional, Roanoke Area, Portage Bay Bridge, Montlake Area—and further broken down into subareas. For clarity, recommendations and additional design considerations are numbered in the narrative and exhibit details. Ownership and/or oversight of specific non-motorized facilities are delineated by color. State facilities are indicated in orange, City facilities in yellow, mixed oversight in orange with yellow and University of Washington facilities in purple.

REGIONAL

Recommendations for the unfunded portions of the regional non-motorized connections focus on completing the regional shared-use path for the full SR 520 corridor from the Eastside to I-5 in Seattle and include evaluation of supporting benefits (+), potential risks (-) and/or requirements (✓). The work does not include the Eastside constructed elements.

1 Provide an **accessible non-motorized path on the south side of Portage Bay Bridge** that completes the regional shared-use path (RSUP) from Eastside communities to I-5 in Seattle.

- + Provides "lake-to-lake" connections from Lake Washington, Portage Bay to Lake Union.
- + Creates a continuous, dedicated non-motorized connection from the Eastside communities to I-5 in Seattle.
- + Offers a more direct, shorter distance and more accessible and constant 2.6% grade than available on existing street routes.
- + Supports anticipated user demands and offers easy, intuitive commute, recreational and neighborhood connections.
- + Has significant public support and endorsement from Seattle Design Commission and city of Seattle.
- + 2014 City of Seattle Bicycle Master Plan supports non-motorized access on Portage Bay Bridge (designated "catalyst" project).
- - Adds additional 16-feet width of structure to Portage Bay Bridge (14-foot shared-use path standard plus 2 feet of barrier).
- ✓ This is part of the WSDOT SR 520 West Side project.

2 **Create belvederes on the regional shared-use path** at Portage Bay Bridge.

- + Provides resting, viewing and interpretation for users.
- + Offers continuity of facilities with funded floating bridge and West Approach Bridge.
- + Eliminates potential conflicts between slower and faster users.
- ✓ Requires additional structure on bridge.
- ✓ This is part of the WSDOT SR 520 West Side project.

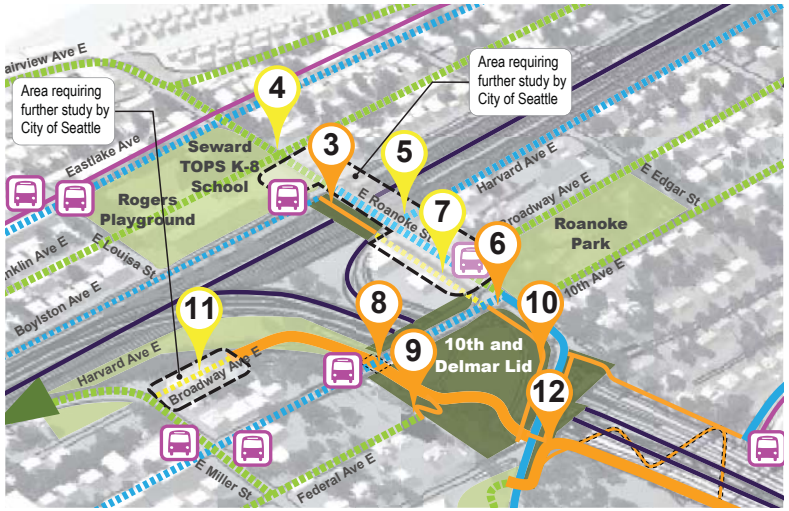


Figure 2 Roanoke Area recommendations and areas for additional study

ROANOKE AREA

Recommendations for improvements in the Roanoke Area focus on improving safety and mobility and providing separated non-motorized facilities where possible and include evaluations of supporting benefits (+), potential risks (-) and/or requirements (✓).

Washington State Department of Transportation

City of Seattle

I-5

Recommendations for the area of I-5 with supporting benefits (+), potential risks (-) and/or requirements (✓) include (See **Figure 2**):

3 Provide a **30-foot wide separated crossin**g with 14-foot wide shared-use path on south side of existing East Roanoke Street over I-5 with landscape pockets and retain existing sidewalk.

- + Increases pedestrian and bicycle safety on East Roanoke Street.
- + Reduces user conflicts with separation of bicycles and pedestrians.
- + Provides visual relief with vegetation.
- + Creates pedestrian refuges for viewing or resting at highway edge.
- ✓ Requires design coordination with SDOT for crosswalk and sidewalk improvements along East Roanoke Street (see Additional Design Considerations).
- ✓ This is part of the WSDOT SR 520 West Side project.

Addition Design Considerations and concepts for future study

The city of Seattle will lead future improvements in the I-5 and East Roanoke Street area. The work group explored several key considerations:

4 Develop **additional bicycle route options west from I-5** to Eastlake via East Roanoke Street (designated future neighborhood greenway) and/or via neighborhood greenways along Broadway Avenue East to Harvard Avenue East and under I-5 at East Allison.

- + Enhances city of Seattle bicycle network.
- + Improves safety and comfort for users.
- ✓ Requires further SDOT analysis and design coordination with updated city of Seattle Bicycle Master Plan.
- ✓ Area of further exploration led by the City of Seattle.

5a **Change right-turn vehicle movements** from East Roanoke Street to Harvard Avenue East from two lanes to one lane.

- + Increases pedestrian and bicycle safety on Roanoke and reduces vehicular conflicts.
- ✓ Requires SDOT traffic operations analysis to determine potential impacts, feasibility and design.
- ✓ Area of further exploration led by the City of Seattle.

5b **Provide bicycle signalization** and lanes on both sides of East Roanoke Street at intersection with Harvard Avenue East.

- + Increases pedestrian and bicycle safety on Roanoke and reduces vehicular conflicts.
- ✓ Requires SDOT traffic operations analysis to determine feasibility and design coordination with the city of Seattle Bicycle Master Plan.
- ✓ Area of further exploration led by the City of Seattle.

5c **Add crosswalks on East Roanoke Street** at Harvard Avenue East and Boylston Avenue East where they are not currently in place.

- + Increases pedestrian and bicycle safety on Roanoke and reduces vehicular conflicts.
- ✓ Requires SDOT traffic operations analysis to determine feasibility and design.
- ✓ Area of further exploration led by the City of Seattle.

East Roanoke Street

Recommendations for the area of the East Roanoke Street with supporting benefits (+), potential risks (-) and/or requirements (✓) include (See **Figure 2**):

6 **Retain T-intersection configuration at East Roanoke Street** and 10th Avenue East.

- + Conforms to feedback from community and other stakeholders.
- + Provides safe pedestrian crossings and reduces vehicle conflicts.
- ✓ Requires SDOT traffic operations final design and approval.
- ✓ This is part of the WSDOT SR 520 West Side project.

7 Widen sidewalk on south side of East Roanoke Street in front of fire station.

- + Provides consistent path width from lid to I-5 crossing.
- + Reduces potential user conflicts.
- - Creates potential conflict with function of fire station.
- ✓ Requires further SDOT traffic operations analysis and design coordination.
- ✓ Owned by City of Seattle.

10th and Delmar Lid

Recommendations for the area of the 10th and Delmar lid with supporting benefits (+), potential risks (-) and/or requirements (✓) include (See **Figure 2**):

8 Create **new, safe and comfortable undercrossing** at 10th Avenue East connecting 10th and Delmar lid shared-use path to Broadway Avenue East and **Harvard Avenue East neighborhood greenway to downtown Seattle.**

- + Provides continuous, grade-separated connection from 10th and Delmar lid to Broadway Avenue East and city of Seattle neighborhood greenway on Harvard Avenue to downtown.
- + Provides accessible grade and route option that avoids steeper grades on 10th Avenue East.
- - Path on west side of 10th Avenue to Broadway street end will require removal of trees and potentially additional elevated structure in WSDOT right-of-way.
- ✓ Bicycle facility on Broadway Avenue East south of SR 520 requires SDOT analysis and design coordination with updated city of Seattle Bicycle Master Plan.
- ✓ This is part of the WSDOT SR 520 West Side project.

9 Connect the 10th and Delmar lid to a recommended city of Seattle **neighborhood greenway on Federal Avenue East** with an accessible path and stairs.

- + Supports city of Seattle Bicycle Master Plan greenways.
- + Provides safe and accessible connections from 10th and Delmar lid.
- - Federal Avenue East between lid and Miller Street is a steep grade, posing accessibility challenges.
- ✓ This is part of the WSDOT SR 520 West Side project.

10 **Improve sidewalks along both sides of Delmar Drive East** and add crosswalk at Delmar Drive East and 11th Avenue East.

+ Improves safety and access for pedestrians along Delmar and to and from 10th and Delmar lid, Portage Bay Bridge shared-use path and Seattle Preparatory School.

✓ Requires SDOT traffic operations analysis to determine feasibility and design.

✓ This is part of the WSDOT SR 520 West Side project.

Areas for additional study in Roanoke

11 Provide additional bicycle facility on Broadway Avenue East south of SR 520 and connecting from proposed SR 520 shared-use path in WSDOT right-of-way to Harvard Avenue East greenway (see above for recommendation of undercrossing at 10th Avenue East.)

+ Completes connection from SR 520 regional shared-use path to city of Seattle network.

✓ Bicycle facility on Broadway Avenue East south of SR 520 requires further SDOT analysis and coordination with updated city of Seattle Bicycle Master Plan and pedestrian and bicycle stakeholders.

✓ Area of further exploration led by the City of Seattle.

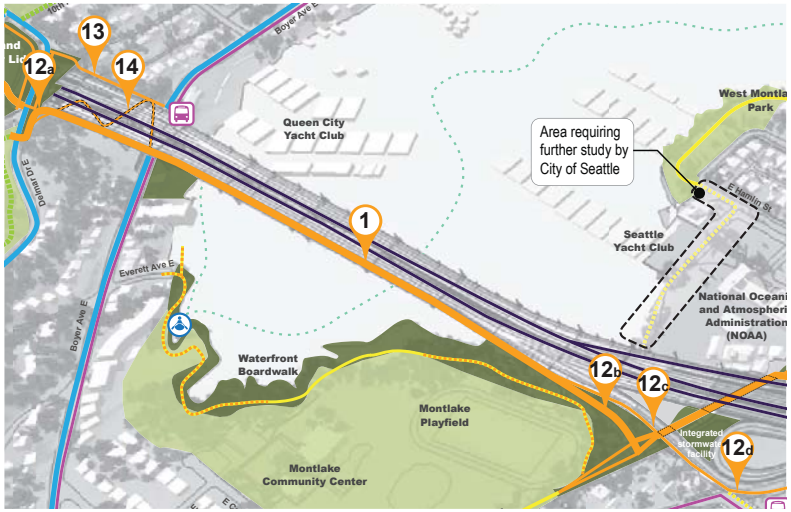


Figure 3 Portage Bay Bridge recommendations and areas for additional study

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PORTAGE BAY BRIDGE

Recommendations for improvements in the Portage Bay Bridge focus on providing intuitive, comfortable and quality connections to and from the new shared-use path on the bridge as well as activating and improving safety of undercrossings and include evaluations of supporting benefits (+), potential risks (-) and/or requirements (✓). (See **Figure 3**)

West Side—Bridge Understructure and Path Connection

12a Design **architecturally-integrated at-grade and separated connections** to and from the shared-use path on the Portage Bay Bridge to provide safe, intuitive and comfortable options for pedestrians and cyclists.

+ Provides connection to neighborhood greenway at East Interlaken Boulevard.

+ Improves school crossing and connections to and from bridge.

- Impacts Seattle Parks Department property and SDOT right-of-way.

✓ Requires additional WSDOT and SDOT coordination to provide connections to and from proposed pedestrian path from Delmar Drive East to Boyer Avenue East and additional crosswalk per SDOT design and approval.

✓ Requires coordination with Seattle Parks Department.

✓ This is part of the WSDOT SR 520 West Side project.

13 **Replace existing stairs** on north side of SR 520 Portage Bay Bridge.

+ Maintains pedestrian access from East Roanoke Street to Boyer Avenue East.

+ Improves substandard stair facility.

✓ This is part of the WSDOT SR 520 West Side project.

14 Create **ADA accessible pedestrian path connection from Delmar Drive East to Boyer** Avenue East.

+ Provides new pedestrian ADA access from Delmar Drive East to Boyer Avenue East.

+ Addresses neighborhood concerns regarding activating space under SR 520 facility.

+ Require further design to ensure feasibility for construction with landslide risks.

✓ This is part of the WSDOT SR 520 West Side project.

Washington State Department of Transportation

City of Seattle

Bridge

Recommendations for Portage Bay Bridge with supporting benefits (+), potential risks (-) and/or requirements (✓) include (See **Figure 3**):

1 Provide an **accessible non-motorized path on the south side of Portage Bay Bridge** that completes the regional shared-use path (RSUP) from Eastside communities to I-5 in Seattle.

- + Provides "lake-to-lake" connections from Lake Washington, Portage Bay to Lake Union.
- + Creates a continuous, dedicated non-motorized connection from the Eastside communities to I-5 in Seattle.
- + Offers a more direct, shorter distance and more accessible and constant 2.6% grade than available on existing street routes.
- + Supports anticipated user demands and offers easy, intuitive commute, recreational and neighborhood connections.
- + Has significant public support and endorsement from Seattle Design Commission and city of Seattle.
- + 2014 City of Seattle Bicycle Master Plan supports non-motorized access on Portage Bay Bridge (designated "catalyst" project).
- - Adds additional 16-feet width of structure to Portage Bay Bridge (14-foot shared-use path standard plus 2 feet of barrier).
- ✓ This is part of the WSDOT SR 520 West Side project.

East Side—Bridge Understructure and Path Connections

Recommendations for the area of the Portage Bay Bridge on the east side with supporting benefits (+), potential risks (-) and/or requirements (✓) include (See **Figure 3** and **Figure 4**):

12 Design **architecturally-integrated at-grade and separated connections** to and from the shared-use path on the Portage Bay Bridge to provide safe, intuitive and comfortable options for pedestrians and cyclists.

12b Create a **barrier-free ramp from Portage Bay Bridge shared-use path to Bill Dawson Trail.**

- + Provides accessible connections to and from Bill Dawson Trail, Montlake Playfield and surrounding neighborhoods.
- + Provides continuous connections along regional shared-use path from Montlake.
- - Requires 8-percent grade ramps for a short distance to meet grade.
- - May have additional environmental (over-water and wetland) impacts.
- - Impacts Seattle Parks Department property.
- - Requires further design, environmental analysis and coordination with Seattle Parks.
- ✓ This is part of the WSDOT SR 520 West Side project.

12c Provide a ramp connection from Portage Bay Bridge shared-use path connection along the eastbound off-ramp to the intersection of Montlake Boulevard East and East Lake Washington Boulevard.

- + Provides direct connection from Portage Bay Bridge to west side of Montlake Boulevard East and Montlake lid and urban trailhead/transit hub.
- - Requires further analysis to ensure meets design requirements.
- ✓ This is part of the WSDOT SR 520 West Side project.

12d Provide a connection from the Portage Bay Bridge shared-use path to a new multi-use path on north side of East Roanoke Street (see Montlake Area recommendations below for multi-use path and reconfigured intersection at East Montlake Place East and East Roanoke Street).

- + Creates neighborhood connection to and from Portage Bay Bridge.
- + Provides safer and more continuous connection to neighborhood greenways and Washington Park Arboretum along Roanoke Street East.
- ✓ Requires coordination and final design approval from SDOT.
- ✓ This is part of the WSDOT SR 520 West Side project.

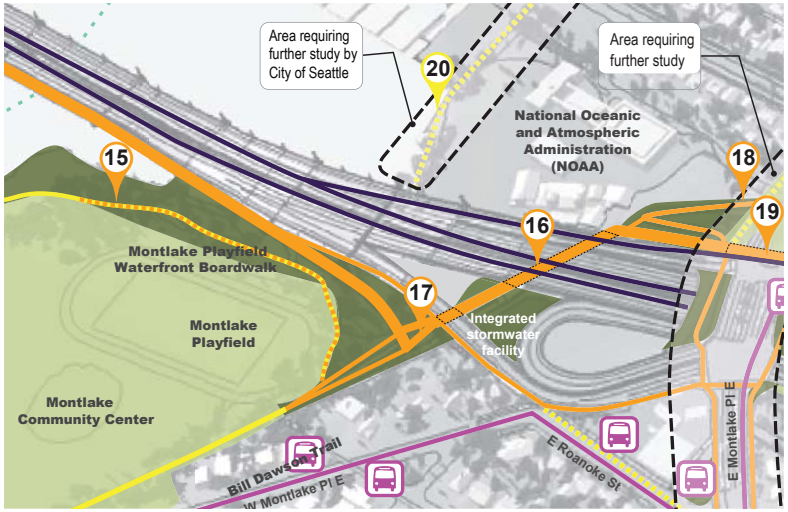

Figure 4 Bill Dawson Trail recommendations and areas for additional study

Bill Dawson Trail and Connections

Recommendations for the area of the Bill Dawson Trail and Connections with supporting benefits (+), potential risks (-) and/or requirements (✓) to it include (See **Figure 4**):

15 Support **Montlake Playfield boardwalk creation** as part of existing city of Seattle Parks master plan for Montlake Playfield waterfront pedestrian path.

- + Fulfills WSDOT SR 520 permit conditions and provides funding only.
- + Enhances pedestrian access to Portage Bay shoreline.
- + Connects Montlake Playfield waterfront Path to Bill Dawson Trail.
- ✓ Requires coordination and final design by city of Seattle Parks Department.
- ✓ This is owned by the City and supported by WSDOT.

16 **Straighten and widen Bill Dawson trail** alignment for improved comfort, safety and sightlines with separation of cyclists and pedestrians using distinctive surfacing.

- + Creates clear sightlines through length of undercrossing by removing tight curves.
- + Improves safety by providing 20-foot wide path with user separation (6-foot wide concrete sidewalk and 14-foot wide asphalt bicycle path) and add increasing undercrossing vertical clearance to 12 feet.
- + Improves quality of experience with reconfiguration from existing narrow, dark, chain link fence condition and improved grade transition.
- + Preserves parking for NOAA under SR 520 facility.
- ✓ Relocating trail behind bridge abutment requires moving abutment further west for structural feasibility.
- ✓ This is part of the WSDOT SR 520 West Side project.

17 Provide **stair and ramp access from Bill Dawson south of Portage Bay Bridge** to shared-use path and connections to East Montlake Place East and East Roanoke Street.

- + Provides multiple connections for users to and from Bill Dawson Trail and Montlake Playfield.
- ✓ This is part of the WSDOT SR 520 West Side project.

18 **Improve connection from west side of Montlake Boulevard East to Bill Dawson Trail** north of SR 520 with reconfigured at-grade ramp and stair access within WSDOT project limits of construction.

- + Provides better sightlines to and from street and Bill Dawson Trail.
- + Reduces amount of above-grade structure.
- + Improves turning radii of path access.
- + Connection remains within limits of construction as defined in the SR 520 Environmental Impact Statement and does not require additional property from NOAA.
- ✓ Requires Federal Land Transfer from NOAA. Further details to be determined in final design.
- ✓ This is part of the WSDOT SR 520 West Side project.

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19 Create a **new undercrossing at Montlake Boulevard East** for safe pedestrian and bicycle crossing and connection of RSUP from urban trailhead/mobility hub to Bill Dawson Trail and Portage Bay Bridge with separation of cyclists and pedestrians using distinctive surfacing.

- + Improves sightlines and safety with wider 20-foot and 12-foot high vertical clearance at undercrossing.
- + Lays back walls at undercrossing entrances to allow for more light and vegetation.
- + Reduces user conflicts with separated bicycle (14-foot asphalt bicycle path) and pedestrian (6-foot concrete sidewalk).
- + Provides consistent, quality and safe experience in high-use, high-conflict area.
- ✓ This is part of the WSDOT SR 520 West Side project.

Areas for additional study at Bill Dawson Trail

The city of Seattle will lead future studies of this area for additional study.

20 Connect West Montlake Park to Bill Dawson Trail and Montlake Playfield along waterfront west of NOAA.

- + Completes connection around Portage Bay.
- + Addresses neighborhood desire for community connection.
- + Cited in Bands of Green Parks Foundation plan.
- - May be restrictions on property use due to homeland security concerns for federal facilities.
- ✓ Requires city of Seattle feasibility studies and design coordination with NOAA, Seattle Yacht Club and adjacent neighbors.
- ✓ This is an area of further exploration led by the City.

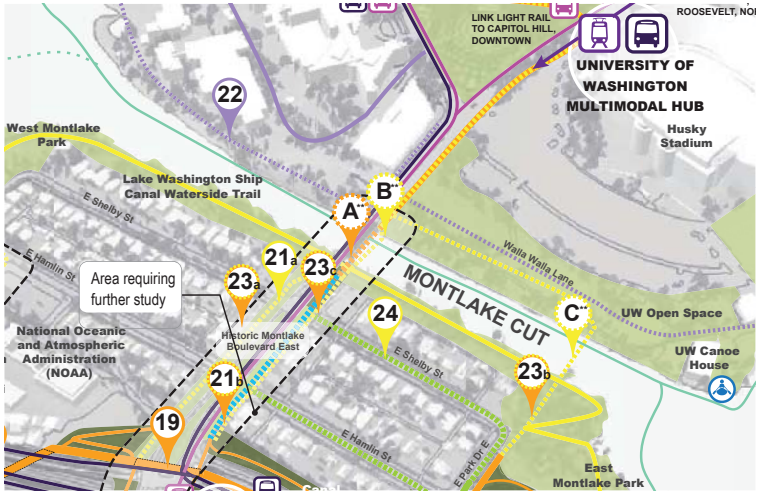

Figure 5 Montlake Boulevard East north recommendations and areas for additional study

MONTLAKE AREA

Recommendations for improvements in the Montlake Area focus on improving safety and mobility, improving character and quality of user experience, and providing separated non-motorized facilities where possible and include evaluations of supporting benefits (+), potential risks (-) and/or requirements (✓). As part of this study, existing crossing lengths at intersections were evaluated and where feasible, reconfigured, shortened or otherwise improved for pedestrian and bicyclist safety. See **Figure 5** and **Figure 6** for details on crossing conditions and recommendations.

Montlake Boulevard East—North of Interchange

With construction of the West Approach Bridge North (WABN) , the current phase of the SR 520 program, the sidewalk on the east side of Montlake Boulevard East between the Montlake interchange and East Hamlin Street will be widened from the existing eight feet to 10 feet to address temporary impacts for pedestrian and cycle users during construction, when the 24th Avenue East off-ramp will be closed for six months. (See **Figure 5** and second cross section **Figure 7**).

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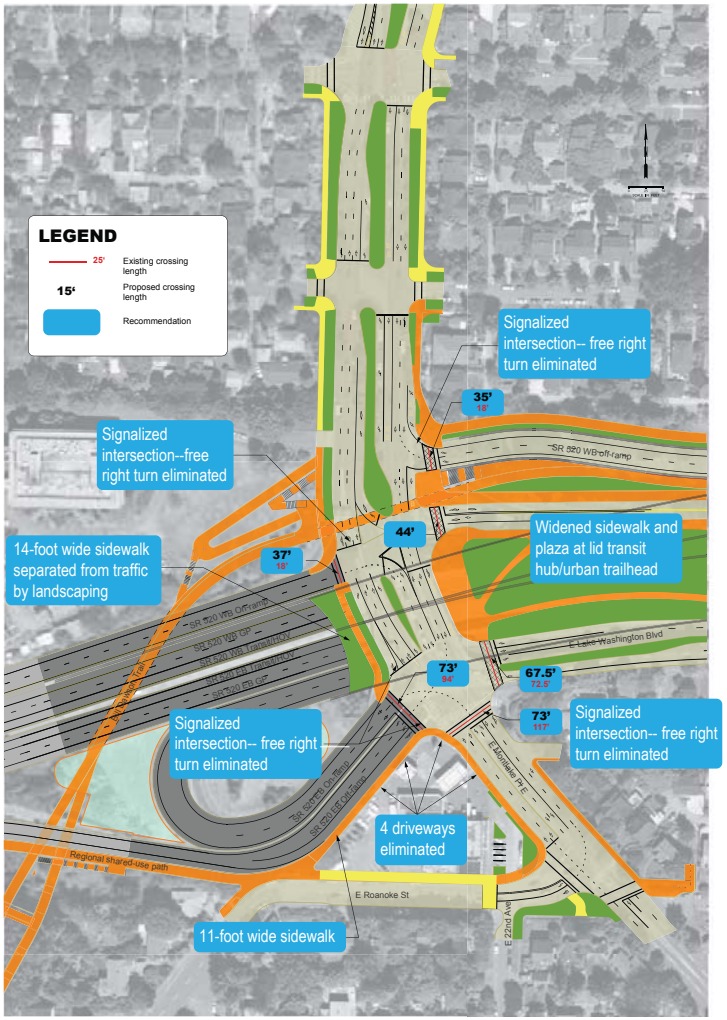

Figure 6 Crossing improvements at Montlake Boulevard East and East Lake Washington Boulevard

21 Provide raised crosswalks or distinctive surface treatments at crossings along Montlake Boulevard East to improve wayfinding, enhance bicycle and pedestrian safety, provide vehicle traffic calming and reinforce the Olmsted boulevard character

21a Provide raised crosswalks at East Hamlin Street and East Shelby Street along both sides of Montlake Boulevard East to improve wayfinding, enhance bicycle and pedestrian safety, provide vehicle traffic calming and reinforce the Olmsted boulevard character.

+ Raised crosswalks improve wayfinding for bicycles and pedestrians.
+ Enhances ADA access.
+ Addresses stakeholder concerns about poorly located curb cuts in existing condition.
+ Enhances continuity of connections and quality of experience from Montlake lid urban trailhead and mobility hub to University of Washington and Burke Gilman Trail and locations south.
+ Provides safety with increased traffic calming and driver awareness.
✓ Requires SDOT coordination and final design approval.
✓ This is owned by the City of Seattle.

22 Create a waterfront recreational path to be developed by the University of Washington (UW) along the north side of the Montlake Cut on the UW campus and connecting under Montlake Boulevard East.

+ Provides safe, off-street connection under Montlake Boulevard East.
+ Improves existing substandard facilities.
+ Cited in the University of Washington *Campus Landscape Framework Plan*.
+ The facility east of Montlake Boulevard East is included in updated city of *Seattle Bicycle Master Plan* as a recommended off-street local connector.
- Widening the path under Montlake Boulevard East at the Montlake Bridge abutment will require additional evaluation for feasibility.
✓ Requires further evaluation and feasibility study by University of Washington.
✓ Requires coordination with UW, WSDOT, SDOT and the Coast Guard.
✓ This is owned by the University of Washington.

Areas for additional study at Montlake Boulevard East

WSDOT and the city of Seattle are actively pursuing design explorations to address the need for improved transit mobility and bicycle and pedestrian access along Montlake Boulevard East and across the Montlake Cut. The city of Seattle is also planning and implementing improvements for the 23rd Avenue/Montlake Boulevard corridor south of East Roanoke Street.

Three alternatives for additional capacity across the Montlake Cut have been identified by the work group and will require evaluation in conjunction with city of Seattle analysis and feasibility studies of the design, operation and maintenance of the respective alternatives. Final adoption of an alternative is pending Seattle city council approval. These alternatives include (See **Figure 1** and **Figure 5** for locations):

A **WSDOT second bascule bridge** for general-purpose traffic, transit, pedestrians and bicycles. This alternative is included in the 2011 SR 520 Preferred Alternative. It would be located directly east and adjacent to the existing Montlake Bridge and provide an 18-foot wide shared-use path on the east side of the new structure.

B **Separate bicycle/pedestrian-only bascule bridge adjacent** to the existing Montlake Bridge and including additional transit improvements. The size and configuration of this option will be determined

C **Separate bicycle/pedestrian-only bascule bridge east of the existing** Montlake Bridge and including additional transit improvements with proposed connections to the RSUP through East Montlake Park.

Pending approval by the Seattle city council of a Montlake Cut crossing alternative, the work group explored several potential conceptual non-motorized improvements along Montlake Boulevard East to the Montlake Cut. Illustrative conceptual cross sections (See **Figure 7** and **Figure 8**) are provided below for clarification of these proposed options and include existing conditions, proposed changes with construction of the West Approach Bridge North (WABN), as well as three options with a range of minimal to more substantive impacts and benefits.

Analysis and design development of these options for improved bicycle and pedestrian access weighted several key criteria, including the:

- Bridge crossing alternative identified for the Montlake Cut (see A, B, and C above)
- Trade-offs between potential environmental and neighborhood impacts, and improved pedestrian and bicycle safety
- Constraints of a limited right-of-way, or opportunities outside of the right-of-way.
- Type of facilities identified in the City of Seattle Bicycle Master Plan
- Potential impact of the options on trees, adjacent neighbors and historic integrity of an Olmsted boulevard

The options explored for non-motorized improvements along Montlake Boulevard East to the Montlake Cut include:

23a **OPTION 1 Widen existing 8-foot sidewalks to 10-feet on both sides** of Montlake Boulevard East (see third cross section in See **Figure 7** and **Figure 8**).

EXPLANATION: *This option was developed to nominally improve non-motorized access along Montlake Boulevard East from substandard conditions with minimal impacts to the existing trees, and right-of-way. The workgroup identified this option as* ***compatible with any of the proposed Montlake Cut crossing alternatives*** *as it nominally improves both bicycle and pedestrian access. Benefits, risks and requirements include:*

+ Widens existing sidewalks (typically 8 feet wide) to 10 feet wide to provide more space for pedestrians and bicyclists.
+ Fulfills 2010 legislative bill Engrossed Substitute Senate Bill (ESSB) 6392 non-motorized recommendations for enhanced 10-foot sidewalks along Montlake Boulevard East, summarized in the *Workgroup Design Refinements and Transit Connections* final report.

+ Does not require additional impacts on right-of-way or center median.
+ The sidewalk on the east side of Montlake Boulevard East from the interchange to Hamlin will be widened to 10 feet to address temporary impacts to non-motorized connectivity from WABN construction.
+ Is compatible with any of the three Montlake Cut crossing alternatives identified.
- May impact health of trees where sidewalk is widened over mature tree roots due to limited right-of-way constraints.
- Does not provide facility to adequately carry current or future bicycle and pedestrian volumes, based on current counts and anticipated increased future volumes with improved regional connections.
- Curb line south of Hamlin on east side of Montlake Boulevard East will move as part of WABN. There may be impacts to existing trees and planting in that portion of the roadway.
✓ Requires SDOT feasibility studies, coordination and final design approval.
✓ This is an area of further study by WSDOT and the City of Seattle.

OR

23b

OPTION 2 Provide a 14-foot wide shared-use path on the east side of Montlake Boulevard East with a 6 to 13-foot wide planting strip (varies along length of this segment) and a 10-foot widened sidewalk on the west side with widened planting strip (12.5 feet minimum). (see fourth cross section in **Figure 7** and **Figure 8**).

EXPLANATION: *This option was developed to improve non-motorized access along Montlake Boulevard East for pedestrians and address existing and future use between the Montlake lid transit hub and the UW Husky Stadium and University Link Light Rail station. The work group identified Option 2 as most compatible with Montlake Cut crossing* **Alternative C,** *which encourages primary bicycle traffic to utilize connections from the regional shared-use path (RSUP) and land bridge through East Montlake Park and across the Montlake Cut via a separate bicycle/pedestrian-only bascule bridge east of the existing Montlake Bridge, while improving the pedestrian environment on Montlake Boulevard East. Benefits, risks and requirements include:*

+ Improves bicycle and pedestrian safety and mobility with a larger and separated off-street facility.
+ Better accommodates all users in area where existing 8-foot sidewalk is used by both cyclists and pedestrians.
+ Can serve as a catalyst for creating improved tree canopy and green space along Montlake Boulevard East.
- Requires the removal and replanting of trees at median and planters.
- Requires moving curbs at street edge and median.
✓ Requires additional design study for feasibility and potential environmental impacts on East Montlake Park.
✓ Requires additional study of the design, operation and maintenance of non-motorized bridge located east of the existing bascule bridge.
✓ Requires SDOT feasibility studies, coordination and final design approval.
✓ This is an area of further study by WSDOT and the City of Seattle.

OR

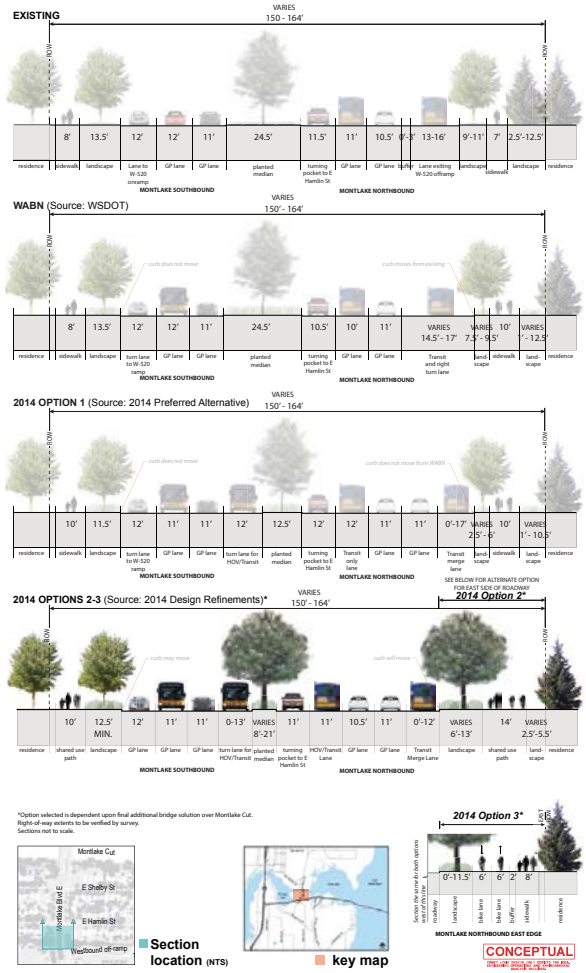

Figure 7 Montlake Boulevard East Design Explorations -- from westbound SR 520 off-ramp to East Hamlin Street

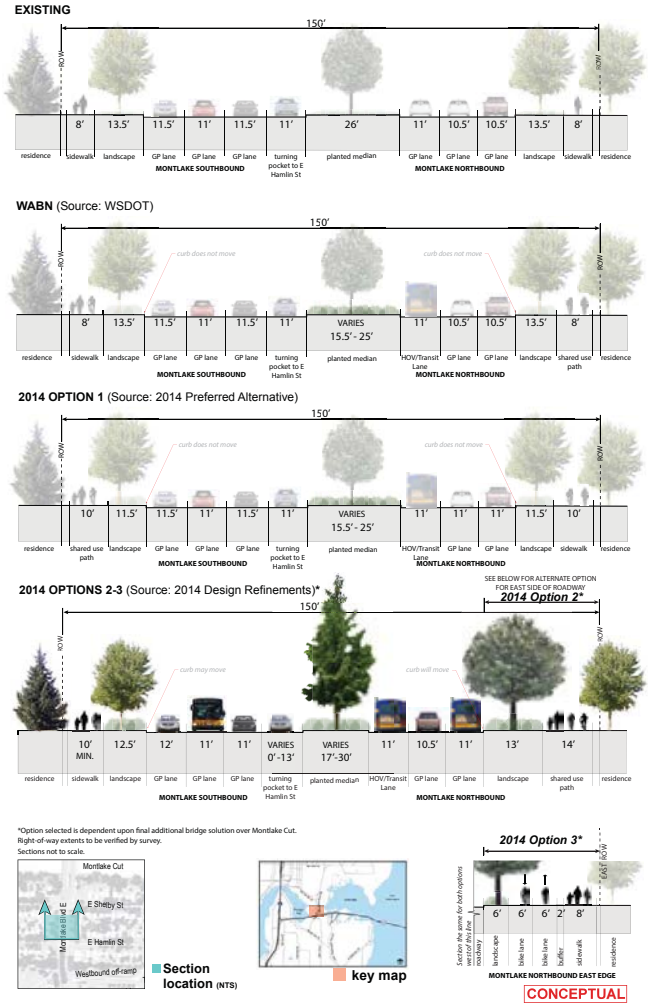

Figure 8 Montlake Boulevard East Design Explorations -- from East Hamlin Street to East Shelby Street

23c **OPTION 3 Provide a 14-foot wide cycle track on the east side** of Montlake Boulevard East (6-foot north and southbound lanes with 2-foot buffer at sidewalk), an 8-foot wide sidewalk, an approximately 0 to 11.5-foot planting area (varies along length of this segment), and 10-foot widened sidewalk on the west side with widened planting strip to 12.5 feet minimum. (See fifth cross section in See **Figure 7** and **Figure 8**).

EXPLANATION: *This option was developed to improve non-motorized access along Montlake Boulevard East and address existing and future use between the Montlake lid transit hub and the UW Husky Stadium and University Link Light Rail station. The work group identified Option 3 as* **most compatible with Montlake Cut crossing Alternatives A** *or B. Option 3 provides an appropriately-sized facility in keeping with the Seattle Bicycle Master Plan to encourage bicycle traffic to utilize connections along the east side of Montlake Boulevard East and logically and comfortably connect across the Cut on a second bascule bridge or separate bicycle/pedestrian-only bridge. Benefits, risks and requirements include:*

+ Conforms to updated 2014 city of Seattle Bicycle Master Plan identification of cycle track on Montlake Boulevard East from Montlake Cut to East Roanoke Street.
+ Creates a more consistent width for cycle track and pedestrian facility from the Montlake lid across the Montlake Cut facility to the Sound Transit UW link light rail station.
+ Improves bicycle mobility and safety with separated off-street facility.
+ Separates users on the east side of Montlake Boulevard East where the existing 8-foot sidewalk is used by both cyclists and pedestrians.
+ This option is compatible with Alternative A WSDOT FEIS preferred alternative proposed second bascule bridge or Alternative B the pedestrian/bicycle-only bridge adjacent to the existing Montlake Bridge.
+ Can serve as a catalyst for creating improved tree canopy and green space along Montlake Boulevard East.
- Requires the removal and replanting of trees at median and planters.
- Requires moving curbs at street edge and median.
✓ Requires SDOT feasibility studies, coordination and final design approval.
✓ This is an area of further study by WSDOT and the City of Seattle.

24 Provide a **counterflow bicycle lane** on East Shelby Street.

+ Improves safety and access for heavily used bicycle route to and from University of Washington, Burke Gilman Trail and Lake Washington Loop Trail—East Shelby Street is a one-way street going west which cyclists already utilize moving in the wrong direction.
+ Is a pre-existing city of Seattle bicycle route and designated neighborhood greenway.
+ Fulfills 2010 legislative bill Engrossed Substitute Senate Bill (ESSB) 6392 non-motorized recommendations, summarized in the Workgroup Design Refinements and Transit Connections final report.
- Requires removal of parking on one side of East Shelby Street (NOTE: alley parking is available)
✓ Requires further SDOT analysis and coordination with updated city of Seattle Bicycle Master Plan and stakeholders.
✓ This is an area of further exploration led by the City of Seattle.

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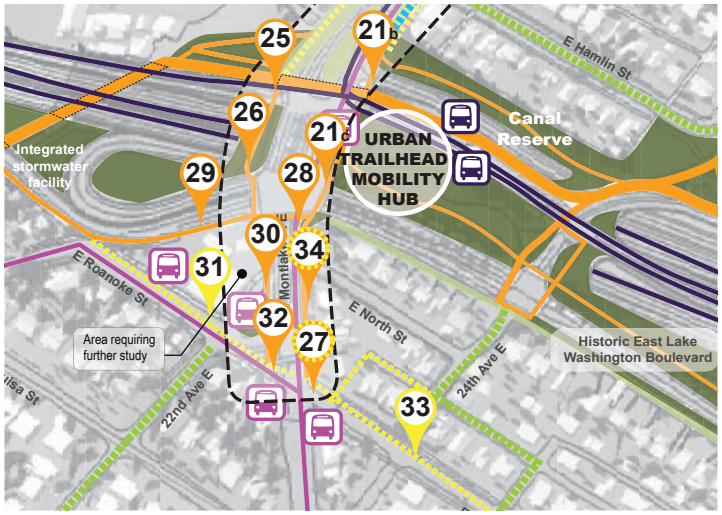


Figure 9 Montlake Boulevard East south recommendations and areas for additional study

Montlake Boulevard East—Interchange

Recommendations for the area of Montlake Boulevard East at the interchange with supporting benefits (+), potential risks (-) and/or requirements (✓) include (See **Figure 6** and **Figure 9**):

25 **Shorten pedestrian crossings** by narrowing lanes and the eliminating free vehicle movements with signalized intersections to enhance safety, comfort and traffic-calming.

- + Improves pedestrian safety on north-south crossings at on- and off-ramps.
- - Reduces lane widths.
- ✓ Requires approval of deviation from design standards.
- ✓ Requires tightening vehicle turning radii.
- ✓ This is part of the WSDOT SR 520 West Side project.

26 Improve **pedestrian experience at interchange** over SR 520 mainline by widening path on both sides of Montlake Boulevard East and enhancing portal edge on west side with buffered plantings along path edges.

- + Deeper lid portal edge structure on west side allows for deeper soils and more tree and shrub plantings.
- + Improves quality of experience for pedestrians by buffering path edges with vegetation.
- + Responds to neighborhood concerns for safety and quality of crossings on west side of Montlake Boulevard East.
- ✓ This is part of the WSDOT SR 520 West Side project.

21b Provide **distinctive surface treatments at crossings** at on- and off-ramps at Montlake Boulevard East to improve wayfinding, enhance bicycle and pedestrian safety, provide vehicle traffic calming and reinforce the Olmsted boulevard character.

- + Improves wayfinding for bicycles and pedestrians.
- + Enhances continuity of connections and quality of experience from Montlake lid urban trailhead and mobility hub to University of Washington and Burke Gilman Trail to the north as well as to locations south.
- + Reinforces visibility and vision of historic boulevard and Olmsted legacy.
- + Provides safety with increased traffic calming and driver awareness.
- ✓ This is part of the WSDOT SR 520 West Side project.

Areas for additional study at Montlake Boulevard East Interchange

The work group also examined potential above-grade pedestrian connections over the SR 520 mainline along the west side of Montlake Boulevard East and over the eastbound on- and off-ramps to East Roanoke Street and West Montlake Place East. This would require the construction of a large elevated structure in order to provide required vertical clearance from the roadway and to meet ADA accessibility standards. The city and state jointly evaluated the idea for preliminary feasibility and determined that while possible, it would require considerable additional structure with negative visual, environmental and property impacts. The Seattle Design Commission also did not support the proposal for additional overhead structures at the Montlake lid area.

The workgroup does not support the above-grade bridge. However, they do recommend the following:

27 Continue ongoing refinement of proposed improvements to connections along the west side of Montlake Boulevard East. If existing constraints change in the future, WSDOT and city of Seattle will pursue other opportunities to further improve conditions for pedestrians and cyclists.

Montlake Boulevard East—South of Interchange

Recommendations for the area of Montlake Boulevard East and East Montlake Place East south of the interchange with supporting benefits (+), potential risks (-) and/or requirements (✓) include (See **Figure 6** and **Figure 9**):

21c Provide **distinctive surface treatments at crossings** at on- and off-ramps at Montlake Boulevard East to improve wayfinding, enhance bicycle and pedestrian safety, provide vehicle traffic calming and reinforce the Olmsted boulevard character.

- + Improves wayfinding for bicycles and pedestrians.
- + Addresses city of Seattle Pedestrian Master Plan designation as a Tier 1 Along the Roadway high priority area
- + Enhances continuity of connections and quality of experience from Montlake lid urban trailhead and mobility hub to University of Washington and Burke Gilman Trail and locations south.
- + Reinforces visibility and vision of historic boulevard and Olmsted legacy.
- + Provides safety with increased traffic calming and driver awareness.
- ✓ This is part of the WSDOT SR 520 West Side project.

25 **Shorten pedestrian crossings by narrowing lanes** and the eliminating free vehicle movements with signalized intersections to enhance safety, comfort and traffic-calming.

+ Improves pedestrian safety.
+ Increases traffic calming and driver awareness.
+ Provides a balanced solution that considers the needs of both pedestrians and vehicles.
- Reduces lanes to non-standard widths.
✓ This is part of the WSDOT SR 520 West Side project.

29 Create **pedestrian and bicycle refuge** by utilizing right-of-way at southeast corner of East Lake Washington Boulevard and East Montlake Place East.

+ Improves pedestrian and bicycle safety.
+ Enhances quality of experience with improved plantings, surfacing and street furniture.
- Requires removal of encroachments.
✓ Requires coordination and final approval of SDOT.
✓ This is part of the WSDOT SR 520 West Side project.

28 Create **11-foot wide sidewalk to Montlake Boulevard East** at gas station and eastbound off-ramp (see above for Portage Bay Bridge East Side).

+ Replaces substandard sidewalk and improves existing pedestrian usage to neighborhood.
+ Provides direct neighborhood connections to retail and Montlake lid, and access to and from Portage Bay Bridge shared-use path.
+ Improves safety and visibility of route.
- Right-of-way constraints limit sidewalk widths.
✓ Requires further analysis to ensure meets design requirements.
✓ Requires coordination with business owner of Montlake Market.
✓ This is part of the WSDOT SR 520 West Side project.

Areas for additional study at south of interchange at Montlake Boulevard East

The work group recommended that WSDOT and the city of Seattle explore opportunities to upgrade the proposed 11-foot sidewalk facility described above to shared-used path design standards (14 feet) should future development occur on the adjacent private property.

30 **Improve existing sidewalks** on both sides of East Montlake Place East.

+ Replaces substandard sidewalks in poor condition.
+ Improves pedestrian neighborhood connections to retail, Montlake lid.
+ Improves safety and comfort of route.
- Constrained right-of-way and private property lines limits widening on east side of street.
✓ Requires coordination and final approval of SDOT.
✓ Requires coordination with business owner of Montlake Market.
✓ This is part of the WSDOT SR 520 West Side project.

31 Develop a **safe, separated and direct multi-use connection** from the Portage Bay Bridge along the north side of East Roanoke Street to East Montlake Place East.

+ Provides a 14-foot wide separated connection from Portage Bay Bridge to neighborhood greenway at 22nd Avenue East.
+ Increases pedestrian and bicycle safety.
+ Enhancing intuitive wayfinding.
- May require removal of on-street parking.
✓ Requires analysis and final approval of SDOT and design coordination with the City of *Seattle Bicycle Master Plan*.
✓ Requires coordination with business owner of Montlake Market.
✓ This is owned by the City of Seattle.

32 **Reconfigure the intersection at East Roanoke Street** and East Montlake Place for improved legibility and traffic-calming and a safer and more direct connection between Montlake neighborhood greenways.

+ Improves pedestrian and bicycle safety.
+ Increases traffic calming and driver awareness.
+ Improves intersection function for transit and vehicles.
+ Provides better connections to and from designated neighborhood greenways.
✓ Requires reconfiguration of parking at Montlake Boulevard Market.
✓ Requires design coordination and final approval of SDOT.
✓ This is part of the WSDOT SR 520 West Side project.

33 **Extend neighborhood greenway connection along East Roanoke Street** east from East Montlake Place East to Arboretum Multi-use Trail and to 24th Avenue East.

+ Builds Seattle neighborhood greenway connections and overall city of Seattle pedestrian and bicycle network.
✓ Requires analysis and final approval of SDOT and design coordination with the City of Seattle Bicycle Master Plan.
✓ This is owned by the City of Seattle.

Areas for additional study at south of interchange at Montlake Boulevard East

The work group acknowledged that the location and configuration of bicycle and pedestrian facilities on Montlake Boulevard East and East Montlake Place East from the proposed Montlake lid to East Roanoke Street still requires additional study and coordination. The Seattle *Bicycle Master Plan* identifies a protected cycle track extending from the existing Montlake bascule bridge to East Roanoke Street. Additional design considerations and concepts for future study may include:

34 **Extend protected cycle track on Montlake Boulevard** from the Montlake lid to East Roanoke Street and 22nd Street.

+ Conforms to updated 2014 city of Seattle *Bicycle Master Plan* identification of cycle track on Montlake Boulevard East from Montlake Cut to East Roanoke Street.
+ Improves bicycle access and safety with protected facility.
+ Provides safe, logical connections to the "Urban Trailhead Mobility Hub", transit, greenway network and north to UW/Burke Gilman/Link Light Rail.
- Constrained right-of-way.
✓ Requires SDOT feasibility studies, coordination and final design approval.
✓ This is an area of further exploration led by the City of Seattle.

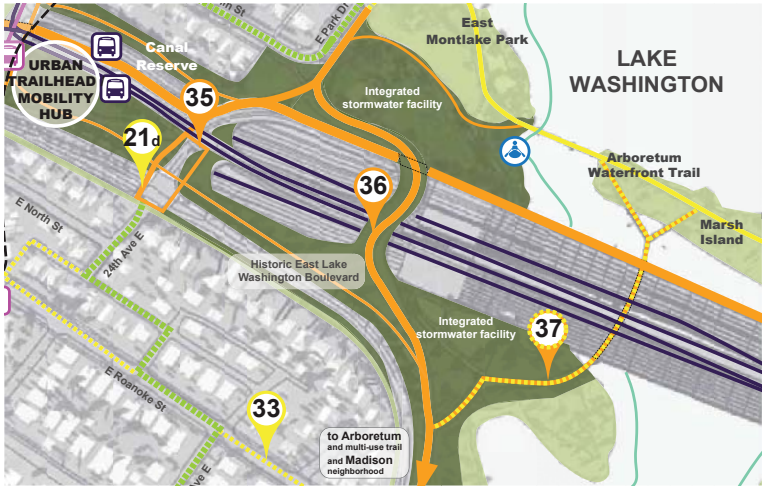


Figure 10 Montlake Lid recommendations and areas for additional study

Montlake Lid—24th Avenue East Off-ramp

Recommendations for the area of Montlake lid at the 24th Avenue East off-ramp with supporting benefits (+), potential risks (-) and/or requirements (✓) include (See **Figure 10**):

21d Provide **raised crosswalks and distinctive surface treatments at crossings** along 24th Avenue East at East Lake Washington Boulevard to improve wayfinding, enhance bicycle and pedestrian safety, provide vehicle traffic calming and reinforce the Olmsted boulevard character.

+ Improves wayfinding for bicycles and pedestrians.
+ Enhances ADA access and addresses concern about poorly located curb cuts in existing condition.
+ Enhances continuity of connections and quality of experience from Montlake lid urban trailhead and mobility hub to University of Washington and Burke Gilman Trail and locations south.
+ Improves pedestrian and bicycle safety with increased traffic calming and driver awareness.
✓ Requires coordination and final approval of SDOT.
✓ This is part of the WSDOT SR 520 West Side project.

35 Provide **four-way signed intersections along 24th Avenue East** on- and off-ramps and at East Lake Washington Boulevard.

- + Improves pedestrian and bicycle safety with increased traffic calming and driver awareness.
- + Provides appropriate urban design scale for neighborhood.
- + Conforms to design requirements for neighborhood greenway.
- - May require future change to signalized intersection for traffic function.
- ✓ Requires coordination and final approval of SDOT.
- ✓ This is part of the WSDOT SR 520 West Side project.

Montlake Lid—East and Shoreline

Recommendations for the area of Montlake lid at the east and shoreline with supporting benefits (+), potential risks (-) and/or requirements (✓) include (See **Figure 10**):

36 Create a **new, non-motorized land bridge** east of the 24th Avenue East off-ramp, which provides a quality, efficient and barrier-free north-south crossing over SR 520, safely connecting the Washington Park Arboretum, East Montlake Park and access to transit.

- + Replaces east half of lid with 70-foot wide direct, barrier-free and accessible crossing meeting public concerns regarding unused spaces and lack of accessibility on the north side.
- + Addresses stakeholder feedback regarding concerns that main north-south routing was previously located under SR 520 facility at shoreline.
- + Improves quality of crossing with screening, vegetation and improved views to East Montlake Park and Lake Washington.
- + Creates intuitive north-south connections between neighborhoods, Washington Park Arboretum and Lake Washington Loop Trail with wayfinding to destinations north at urban trailhead and mobility hub at lid, University of Washington, and Burke Gilman Trail.
- ✓ This is part of the WSDOT SR 520 West Side project.

37 Develop a **new undercrossing that extends the Arboretum Waterfront Trail** under SR 520 at the Lake Washington shoreline and provides additional comfortable and safe pedestrian connections to the Arboretum.***

- + Extends and completes the Arboretum Waterfront Trail identified in the Washington Park Arboretum Master Plan and provides direct connection to and from East Montlake Park and Washington Park Arboretum.
- + Improves safety with better sightlines, light and more vertical clearance.
- + Creates a connection more sensitive to character of existing Arboretum trails and wetland experience.
- + Is ADA accessible.
- + Addresses stakeholder feedback regarding concerns about safety and experience by relocating path away from abutment on water under second taller bay of West Approach Bridge.
- - May have additional environmental (over-water and wetland) impacts.
- ✓ Requires coordination with Seattle Parks Department.
- ✓ This is part of the WSDOT SR 520 West Side project.

***NOTE:** The boardwalk alignment as illustrated in this report is one potential solution for this important pathway connection; specific landing points and layout are subject to further study by WSDOT and the city of Seattle.

SR 520 and City of Seattle Non-motorized Connectivity Technical White Paper

Next Steps

The recommendations and additional design considerations listed above will serve as the basis for continued and future bicycle and pedestrian planning and design implementation for the SR 520 project West Side facilities and transitions to and from the Seattle non-motorized network. In anticipation of legislative funding, the SR 520 program and the city of Seattle will continue to coordinate efforts to ensure relevant, quality non-motorized facility planning and design implementation.

A number of the non-motorized elements identified in this document by the work group are already identified as future facilities in the city of Seattle Bicycle Master Plan. There are also several proposed additions to the city of Seattle bicycle and neighborhood greenway facilities discussed in this document that are key components in providing transitions to and from the SR 520 bicycle and pedestrian facilities. They are denoted in a yellow, dashed line in the non-motorized connections exhibit. Those additions include:

11 **On-street bicycle facility on Broadway Avenue East south of SR 520** This connects the proposed SR 520 regional shared-use path from under 10th Avenue East and the SR 520 right-of-way to the Harvard Avenue East neighborhood greenway.

23 a,b,c **Bicycle and pedestrian improvements on Montlake Boulevard East** This area is an area of further study led by WSDOT and the City of Seattle and identified in the Seattle Bicycle Master Plan as the potential location of a cycle track. Three alternatives are explored in this document.

24 **Counterflow bicycle lane on East Shelby Street** East Shelby Street is a designated bicycle route and city of Seattle neighborhood greenway.

31 **Multi-use path on East Roanoke Street** This connects the proposed SR 520 regional shared-use path on the Portage Bay Bridge connecting at West Montlake Place East to the neighborhood greenway on 22nd Avenue East and to the proposed neighborhood greenway (see 38 below) on East Roanoke Street east of East Montlake Place East.

36 **Neighborhood greenway connection along East Roanoke Street** This provides a connection from East Montlake Place East to Arboretum Multi-use Trail and 24th Avenue East neighborhood greenway.

SDOT and the city of Seattle have continued to solicit feedback from stakeholders through outreach to neighborhood organizations, the Seattle Bicycle Advisory Board, Seattle Pedestrian Advisory Board, Seattle Neighborhood Greenways groups, Friends of Seattle Olmsted Parks, Cascade Bicycle Club, Feet First, Seattle Preparatory High School, Seattle Yacht Club, Queen City Yacht Club, NOAA and others.

Stakeholder input will continue to inform ongoing design development, and provide valuable feedback where additional consideration of concepts for further study is required. Decisions regarding alternatives for the Montlake Cut will be addressed by Seattle City Council and provide direction for future design.

Over the next year, WSDOT will capture design recommendations for improvements to State non-motorized facilities identified within this document, in conjunction with Seattle City Council endorsement, in conceptual-level engineering plans to ensure that when funding is received, the agency will be ready to implement design.

APPENDIX C

SR 520 DESIGN PROGRESSION OVERVIEW

APPENDIX C

SR 520 DESIGN PROGRESSION OVERVIEW

How has WSDOT identified and refined the SR 520 Preferred Alternative?

For many years, WSDOT has been working with agency partners, stakeholders, and the public to develop and analyze corridor alternatives in order to select and refine a Preferred Alternative. Major steps in this process are described below, while additional detail on each step can be found in source documents cited in Appendix G.

2006 Draft EIS

Identifying a preliminary range of alternatives

The August 2006 Draft EIS for the SR 520 Program evaluated the No Build Alternative and two build alternatives, the 4-Lane Alternative and the 6-Lane Alternative. Based on this analysis and public feedback, WSDOT decided to continue evaluating only the No Build Alternative and 6-Lane Alternative design options.

2008 Mediation

Identifying the best 6-Lane Alternative design options

Three 6-lane design options were developed through a stakeholder mediation process established as part of ESSB 6099, enacted during the 2007 Legislative Session. The mediation process included elected officials; local, federal, and state agencies; neighborhood representatives; local organizations; and WSDOT.

2009 Legislative Workgroup

Reviewing Options A, K and L as identified from 2008 mediation

ESHB 2011 created the SR 520 Legislative Workgroup, a group of legislators and transportation officials, to present recommendations on financing and a west side design for the SR 520 corridor to the Governor and the Legislature.

2010 Supplemental Draft EIS

Analyzing alternatives and selecting a Preferred Alternative

The January 2010 Supplemental Draft EIS evaluated the effects of a No Build Alternative and three 6-Lane Alternative design options. The Supplemental Draft EIS recommended a Preferred Alternative similar to the Final Concept Design configuration in terms of its geometry, although it was wider and had a taller west approach profile. The Preferred Alternative:

- Maintained the existing location of the Montlake interchange.
- Changed the westbound off-ramp to connect separately to 24th Avenue East and Montlake Boulevard East.
- Included a new bascule bridge over the Montlake Cut, parallel to the existing Montlake Bridge.
- Included a 1,400-foot lid over Montlake Boulevard East with landscaping, ramps, transit facilities, and pathways.
- Provided near-term transit enhancements along with the ability to accommodate potential future light rail on SR 520.

2010 ESSB 6392 Workgroup

Refining the Preferred Alternative

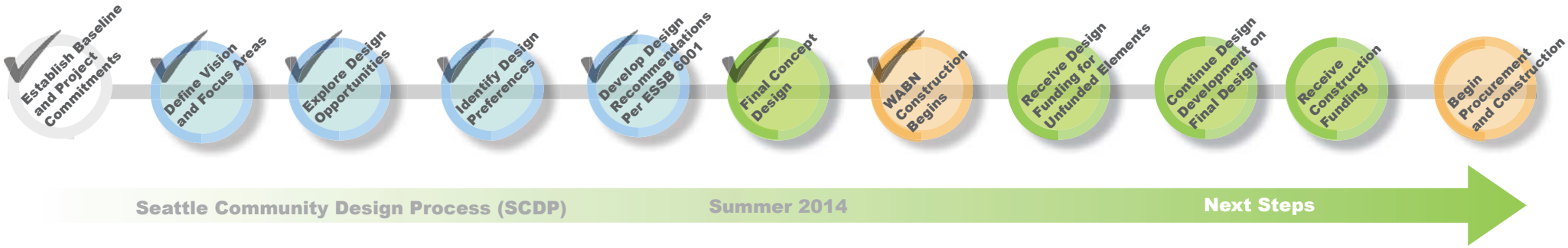
During the 2010 Legislative Session, the Washington State Legislature passed ESSB 6392, which outlined specific areas and elements of the SR 520 project Preferred Alternative to refine through a multi-agency process. Based on legislative direction, WSDOT, the Seattle Mayor, and the Seattle City Council established a Workgroup that brought together King County Metro, the University of Washington, Sound Transit, and other designees to consider design refinements and transit connections within the Preferred Alternative.

More than 350 people attended the September 2014 open house event in Seattle.

The Workgroup recommendations included the following (among others):

- Establish a design process to expand and refine the vision, goals, and design treatments for urban design and streetscapes.
- Enhance bicycle and pedestrian connections.
- Establish measures to trigger construction of a second bascule bridge across the Montlake Cut.
- Maintain the SR 520 reversible transit/HOV ramp to and from I-5.
- Implement noise reduction strategies throughout the corridor.

The final report included the Workgroup's recommendations on the comprehensive design refinements and transit connection improvements to the SR 520 Preferred Alternative as well as an overview of public comment. As part of this process, Workgroup participants also developed a "High Capacity Transit Planning and Financing Findings and Recommendations Report" and a "Washington Park Arboretum Mitigation Plan" (Dec. 2010). Through this process, WSDOT and the city of Seattle also agreed to continue working with key stakeholders and the public to implement the Workgroup recommendations, develop future Seattle design processes, and address other issues raised.



2011 Final EIS Preferred Alternative

Incorporating Preferred Alternative refinements

The June 2011 Final EIS analyzed the direct, indirect, and cumulative effects of the Preferred Alternative compared to the No Build Alternative and the three Supplemental Draft EIS 6-lane design options. WSDOT also incorporated the design refinements made during the ESSB 6392 Workgroup process.

2011 Record of Decision

Identifying and approving the Preferred Alternative

In summer 2011, the Federal Highway Administration approved the Final EIS and confirmed that the Preferred Alternative could be considered the project's Preliminary Concept Design with the federal Record of Decision. While WSDOT had adequate budget to complete Final Design of the SR 520 floating bridge and begin construction in 2012, most corridor elements in Seattle did not have funding to advance design or begin construction.

2012 Seattle Community Design Process

Refining the Preliminary Concept Design in Seattle

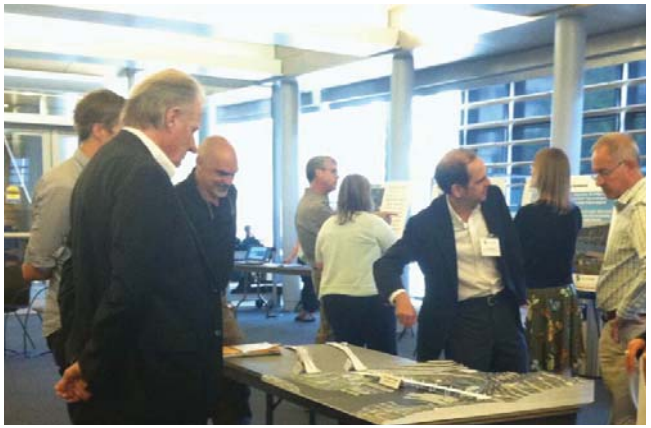
This robust and collaborative effort between WSDOT, the city of Seattle, design professionals, and the broader public resulted in a refined corridor vision and conceptual design for unfunded portions of the SR 520 corridor in Seattle. While many well-supported design refinements were endorsed and incorporated into the Preliminary Concept Design, the city asked WSDOT to continue exploring the design of the Portage Bay Bridge, Montlake lid, and non-motorized connectivity through Resolution 31427, which was passed in February of 2013.

2014 West side design refinements

WE ARE HERE!

Completing the Final Concept Design in Seattle

Per ESSB 6001, WSDOT and the city continued exploring design elements not resolved through the 2012 Seattle Community Design Process. A team of design professionals, working in collaboration with the Seattle Design Commission and supported by WSDOT and city staff, recommended design refinements for the Portage Bay Bridge, Montlake lid, and non-motorized connections.



Portage Bay Bridge models on display before a Seattle Design Commission meeting.

City of Seattle Washington State Department of Transportation

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APPENDIX D

SUMMARY OF SEPT. 11, 2014 OPEN HOUSE PUBLIC COMMENT

APPENDIX D

SUMMARY OF SEPT. 11, 2014 OPEN HOUSE PUBLIC COMMENT

Overview

On Sept. 11, 2014, WSDOT and the city of Seattle hosted a public open house at the Montlake Community Center. The purpose of the event was to share refined conceptual designs for key areas on the Seattle side of the SR 520 corridor, including:

- Portage Bay Bridge (including bridge type and options for a shared-use bicycle/pedestrian path).
- Montlake lid area (including lid functionality and bicycle/pedestrian/transit connectivity options).
- Non-motorized connections in and around the SR 520 corridor in Seattle.

Nearly 350 people attended the event and over 150 individual comment cards were received. Members of the public also shared feedback through interactive conversations with SR 520 Project staff, city staff and other neighbors.

The public was also able to view various informational boards with overviews and updates on the following topics:

- SR 520 Bridge Replacement and HOV Program
- SR 520 West Approach Bridge North Project
- Design process overview of the SR 520 corridor in Seattle

Open house focus

Design concepts shown at the open house built on the work conducted in the 2012 Seattle Community Design Process (SCDP). The SCDP was a robust public process to refine the vision and design of the unfunded portions of the SR 520 Project between I-5 and Lake Washington. Many well-supported design refinements emerged from the SCDP, and in some geographic areas further design work was needed. WSDOT and the city of Seattle worked with a team of design professionals and in close consultation with the Seattle Design Commission to further refine design concepts for the unresolved areas, which were the focus of the September 11 open house.

Members of the public were able to view conceptual design renderings of refined concepts for the Portage Bay Bridge, Montlake lid area and non-motorized connectivity networks. Materials compared visuals of existing conditions, the Preliminary Concept Design approved by the Federal Highway Administration in the SR 520, I-5 to Medina Project Record of Decision, and the refined concepts being developed.

The event also featured physical models of the refined concepts for the Portage Bay Bridge and Montlake lid, and an animation provided a “virtual stroll” through the refined corridor. Members of the public were able to view the design materials and share their feedback by providing written comments and having conversations with WSDOT and city of Seattle staff.

Open house accomplishments

The public was appreciative of the design work that has been completed and for WSDOT and the city of Seattle sharing the refined concepts with the community. There were many comments indicating that the refined concepts were an improvement over the concepts shared in the 2012 SCDP.

The event attracted record attendance, including many people who have not been actively involved with the SR 520 Program as well as many people who have been well-engaged with the program. The public was eager to view the latest design concepts and provide their feedback. Many people also expressed an interest in seeing the project receive funding for construction.

Key themes of public feedback

Public comments heard at the event were diverse. Feedback was split on some topics while clear themes emerged on others. WSDOT and city of Seattle staff considered all of the feedback heard at the event, which will be used to help inform final conceptual design recommendations to the Seattle City Council Transportation Committee.

Following is a summary of general themes of public feedback organized by key topics and geographic areas. This summary is intended to capture the themes of public feedback from comment cards and conversations with WSDOT and city of Seattle staff and is not inclusive of all of the individual comments received.

The public was invited to ask questions and fill out comment forms at the September 2014 open house event.

Washington State Department of Transportation City of Seattle

WSDOT staff used drawings and 3D models to answer questions about the design.

WSDOT staff answered questions at the September 2014 open house event.

General:

- General appreciation for the design work that has been done, and for WSDOT and city of Seattle staff being available to discuss the design concepts with the community.
- Current design concepts show progress from designs developed in the 2012 Seattle Community Design Process.
- Concerns about traffic, noise, and air quality in and around the SR 520 corridor.
- Concerns regarding the lack of funding for west side project elements and questions about when funding will be received. People are ready for the project to be constructed.
- The physical models and animation were useful and popular tools that helped people to understand the refined concepts.

Montlake lid area:

There was general support for the following design concepts:

- Improvements to the Bill Dawson Trail undercrossing.
- Proposed boardwalk connection underneath SR 520 at the shoreline of Lake Washington.
- The land bridge and the east end of the lid area are improvements.

People asked that WSDOT continue exploring/refining/improving the following areas:

- West end of the lid (bike/pedestrian connectivity), particularly on Montlake Boulevard East.
- Transit connections, particularly the lack of buses crossing Lake Washington and serving the Eastside.
- Routes and crossings for transit connections between local and regional buses, particularly getting to and from the southbound local bus stop.

The following concerns were expressed:

- Bicycle and pedestrian connectivity and safety on Montlake Boulevard East, specifically at the SR 520 interchange and Montlake Cut crossing.
- Traffic congestion on the Montlake Bridge and throughout the Montlake area.
- The community is losing a benefit with the smarter lid concept and requests to receive something else in return.
- Safe bicycle and pedestrian connections from the 22nd Avenue greenway to the University of Washington area, including the University Link Light Rail station. Requests for a separate bicycle and pedestrian bridge in this area and a safer connection on the west side of Montlake Boulevard East.
- Potential noise and air quality effects of the Final Concept Design, particularly among residents of East Lake Washington Boulevard.

Portage Bay Bridge:

- Encouraged by the design progression of both the box girder and cable stay bridge type concepts.
- No clear consensus on a preferred bridge type.
- Support and enthusiasm for the addition of a shared-use bicycle and pedestrian path, and questions about connections on the east and west ends of the bridge.

Non-motorized connectivity:

- Current concepts show great improvement for safety and travel options as compared to concepts shared in the 2012 SCDP.
- Concerns about bicycle and pedestrian conflicts with vehicles on Montlake Boulevard East and 24th Avenue East.
- Requests for a cycle track on Montlake Boulevard East, which is consistent with the updated 2014 Seattle Bicycle Master Plan.
- Questions about how people would travel on the trail networks to and from various locations.
- Concerns about safety of greenways routes and connections to these routes.

Next steps

WSDOT and the city of Seattle used feedback received at the open house to inform staff design recommendations shared with the Seattle City Council Transportation Committee. WSDOT and the city are also working together to document the design process and the Final Concept Design recommendations in this report, which will be shared with the Washington State Legislature. Both agencies continue to work together to secure funding to complete the SR 520 corridor in Seattle.

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APPENDIX E

SEATTLE DESIGN COMMISSION MEMORANDUM

APPENDIX E

SEATTLE DESIGN COMMISSION MEMORANDUM

Seattle design Commission

Ed Murray
Mayor

Diane Sugimura
Director, DPD

Marshall Foster
Planning Director, DPD

Osama Quotah, Chair

Shannon Loew, Vice Chair

Bernie Alonzo

Brodie Bain

Lee Copeland

Thaddeus Egging

Megan Groth

Martin Regge

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MEMORANDUM

To: Honorable Mayor Ed Murray
Seattle City Councilmembers

From: Seattle Design Commission

Date: September 17, 2014

Subject: Seattle Design Commission recommendations for the Portage Bay Bridge and Montlake Lid components of the SR 520 Replacement Project

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Dear Mayor Ed Murray and Councilmembers:

The Seattle Design Commission (SDC) is pleased to provide our comments on the conceptual design development and urban integration of two key elements of the State Route (SR) 520 project: replacement of the **Portage Bay Bridge** and the creation of a structure over portions of SR 520 near Montlake Blvd E (**Montlake Lid**). This memo provides the Mayor and City Council with the SDC's recommendations on questions of urban design for these two critical components of the SR 520 project.

The Seattle City Council requested the SDC's review of these project elements as part of their 2012 Resolution (Resolution 31427) concerning this key transportation corridor. This resolution included a request that SDC review these two project elements before the Washington State Department of Transportation (WSDOT) proceeds with funding requests to the Washington State Legislature. WSDOT has indicated that they are ready to proceed with funding for these project elements in the 2015 legislative session.

Washington State Department of Transportation City of Seattle

To facilitate the SDC's review, WSDOT and City staff provided three briefings to the full SDC and five additional workshops with an SDC subcommittee. To support this work, WSDOT engaged a roster of consultants in urban planning, urban design, landscape design, and bridge design to illustrate and explain design options for both project elements. At the presentations to the full SDC, interested agencies and citizens also provided comments for the SDC to consider during our deliberations.

We understand that WSDOT has adopted the Legislature's *Least Cost Planning* approach for infrastructure funding. The SDC's composition of design, architecture, and engineering professionals allowed for a unique forum to balance conceptual decisions that promote quality design with fiscal analysis of each design alternative.

Endorsement of the Project Vision and Goals
In 2012, WSDOT developed a framework outlining their vision and goals for the SR 520 corridor in Seattle. That framework, also supported by the SDC, established a broader urban design framework beyond SR 520's role as a key regional transportation corridor. In 2014, WSDOT engaged the SDC to further define a vision and goals that specifically address the Portage Bay Bridge and Montlake Lid. The SDC continues to support WSDOT's visions and goals for this corridor. Given the complexity of these projects, their impacts at both the neighborhood and regional scale, and the importance of interdepartmental collaboration to achieve success, WSDOT's vision and goals should be the reference point for evaluating and proceeding with funding options for both the Portage Bay Bridge and the Montlake Lid.

Endorsement of and Recommendations for the Design Process
The SDC greatly appreciates WSDOT staff and their consultants for their focused design process, highly collaborative engagement, and extensive reviews with the SDC. The quality of WSDOT's presentations added much depth to the process. The SDC also appreciates the opportunity to have been part of the consultant selection for key projects within the SR 520 corridor. This collaborative approach will continue to benefit the project and is invaluable for our support of this important transportation infrastructure. We look forward to WSDOT's continued consultation with the SDC as it develops future RFPs, selects designers, and contracts projects in the corridor.

We particularly appreciate WSDOT's commitment to extend the regional multi-use trail across Portage Bay. The SDC advocated strongly for this important feature during the 2012 Seattle Community Design Process. As we revisit the Portage Bay segment of the corridor, we again thank WSDOT for their earlier work on reducing lane widths and providing flexible lanes to minimize the overall width of the bridge.

Moving forward, we hope that WSDOT will continue to engage the City of Seattle. With DPD and SDOT actively involved in design explorations, superior solutions can emerge that stitch the

freeway corridor into the urban fabric and modal networks of our city. The SDC believes that the project will suffer if WSDOT terminates its design efforts at the edge of its right-of-way. We hope the City will remain a proactive partner in order to build on the momentum of change for the benefit of the communities along the corridor.

The SDC also recommends that WSDOT continue its integrative approach towards project design, with urban design at the center of design development. We recognize the time and resources WSDOT has spent to facilitate such a comprehensive, multidisciplinary, and interagency design process. This innovative and collaborative approach has produced context-sensitive infrastructure that is functional and reflects the needs, concerns, and voices of diverse and complex users, stakeholders, and community groups. We are hopeful that WSDOT will continue to implement this process on this and other projects.

Portage Bay Bridge

Context
Portage Bay and the surrounding neighborhoods form a unique environment within Seattle. The arrangement of hills, water, and wetlands forms a curved bowl that is intimate in scale. The surrounding built environment includes large institutional uses like the University of Washington, smaller institutional and water-dependent uses in Portage Bay, and fine-grained residential development on the hillsides and in floating residences to the north. As is the case in other locations within Seattle, SR 520 passes through and touches residential neighborhoods without the buffer of large-scale commercial or industrial uses. Sensitivity to designs that buffer the freeway from the adjacent neighborhoods is thus essential to successful integration.

The Portage Bay Bridge is one of a series of bridges interspersed throughout the city. These bridges provide fundamental connections among Seattle's neighborhoods. A diversity of bridge types surrounds Portage Bay, including the high, double-deck, steel truss Ship Canal Bridge; the

ornate and historic University and Montlake Bridges; and the low-profile Evergreen Point Floating Bridge. Any new bridge at Portage Bay will (and should) acquire an equally unique identity.

Overall Recommendations

The new Portage Bay Bridge must be both a distinctive and context-sensitive element within the family of SR 520 bridges. Given its context, the bridge should appear elegant and light and enhance the unique character of Portage Bay. Bridge elements such as piers, abutments, and vertical lighting poles should complement the context without mimicking the natural, historical, or built environments. With the addition of a shared-use path, the Portage Bay Bridge helps complete regional connectivity for all modes of users from SR 202 in Redmond to I-5 in Seattle and beyond.

- To accommodate different users within the corridor, whose use varies based on speed, skill, and field of vision, consider any bridge design from all perspectives including on, above, and below the bridge and from various vantage points.
- Emphasize minimizing the appearance of the bridge deck and related infrastructure for recreational users and nearby residents.
- Consider the bridge within the context of the larger SR 520 network, particularly its role as a gateway experience both entering and leaving Seattle.
- Closely examine where each bridge section lands near Montlake Blvd E to the east and 10th Avenue E and Delmar Drive E to the west in order to integrate the project within the urban fabric of each neighborhood. Pay special attention to how the design affects deck heights at both ends and the experience and networks of cyclists and pedestrians. Connect the shared-use path up to and over the Delmar Lid as directly as possible.
- The slope of the bridge should both enhance its contextual relationship to Portage Bay and consider the needs of cyclists and pedestrians. While we recommend that WSDOT continue to study retaining the elegance of hugging the natural grade, this should not come at the expense of a consistent design for the entire Portage Bay span.
- Any bridge design should emphasize lightness in appearance and scale and complement its location within Portage Bay. This is particularly important given the size and number of columns below the deck, which should be reduced as much as possible in number and prominence.
- Integrate architectural elements within the overall design of the bridge to provide aesthetic interest and follow a structural logic.
- Design the bridge to relate to the horizon line in a logical and compelling fashion.
- Maximize the amount of natural light that reaches the water and land. To accomplish this, pursue greater horizontal separation between the east- and westbound bridge segments.

<u>Option 1: Cable Stay Bridge</u>

Background

WSDOT presented the SDC with three separate versions of a cable stay bridge over Portage Bay. Our initial review began with the two-tower version evaluated in the Final Environmental Impact Statement (FEIS). During our review, WSDOT refined the cable stay concept to include two additional bridge types—one with a single tall tower and the other with three towers of various heights. In all versions, the eastern portion of the bridge nearest Montlake is a beam bridge; this secondary bridge type reduces construction costs. Attachment A shows the cable stay designs we considered.

Analysis

Cable stay bridges offer the opportunity to reduce the amount of structure below the bridge deck. Spans can be wider, columns fewer, and the bridge deck thinner. These characteristics create a positive environment for portions of Portage Bay used for recreation purposes at or near the water and improve the overall experiential quality of the bridge. The distinctive character of cable stay bridges and their vertical elements attracts the eye and commands attention. When properly designed and sited, these elements can enhance and define their settings. However, the concept alternatives the SDC reviewed overpowered Portage Bay and its unique context. The visual impacts of these vertical elements detracted from the desirable horizontal character and lightness inherent in cable stay bridges.

Recommendations
After careful analysis, the SDC believes a cable stay bridge is not the most compelling option for Portage Bay. A small number of Commissioners felt that the time allotted for the study did not allow for a full exploration of cable stay options and that a concerted effort here could result in an appropriate design. However, weighted against other bridge types and project considerations, the majority of Commissioners believe a cable stay bridge to be the least appropriate of those presented in this study.

If WSDOT proceeds with a cable stay bridge, the SDC recommends the following:

- Maximize the cable stay technology to significantly reduce the profile of the bridge deck, size of vertical elements, and number and girth of columns in the water. The bridge should be as thin and light on the water as possible. Take great care not to create a structure that overwhelms the scale of the Portage Bay bowl.
- Leverage the bridge technology to create a dynamic and elegant formal solution to the design.
- Design the bridge lighting with consideration for the residents in the area and with the aim of elegance rather than drama.

<u>Option 2: Box Girder Bridge</u>

Background
The SDC evaluated a box girder bridge and had the opportunity to help refine the design as part of our explorations. The initial renderings presented to the SDC from the 2010 FEIS showed a bridge with a varied slope and up to 14 columns, 11 of them in the water:

As our review progressed, WSDOT refined the design to have a uniform slope, which enhances the non-motorized experience. The refined design also reduced the number of columns, resulting in reduced environmental impacts. Attachment B shows the box girder designs we considered.

Analysis
A box girder bridge is a utilitarian solution that places function above form and aesthetics. It is commonly seen as part of the American highway bridge vernacular. The box girder is bulkier and heavier at and below the bridge deck than the cable stay bridge. More columns are necessary, adding to the innate heaviness of this bridge type. Because it does not have above-deck structural elements, the box girder is horizontally oriented. While it lacks the presence of more structurally expressive bridge types, the width of the deck and location within Portage Bay will nevertheless have a visual impact that warrants careful consideration.

There are many examples of designs that have pushed the limits of this typology to achieve a higher aesthetic and contextual standard. The work of the design consultants and our experience reviewing the West Approach Bridge North make us confident that the box girder can provide an elegant, distinctive solution. The design effort should focus on maximizing the thinness and lightness of the bridge. The WSDOT team has already started to investigate reducing the number of columns and adjusting the profile of the structure to minimize the visual impacts of the bridge deck.

Recommendations
Given the analysis to date, the SDC believes that the box girder bridge has the greatest potential for success in Portage Bay. However, to fully meet the vision and goals of this project, the box girder bridge must be well funded in order to be designed *for this place and its context*.

If the budget is spare, the result will be a boxy, heavy highway bridge. Furthermore, architects and urban designers must continue to play leading roles on the project team. WSDOT's project engineers and agency leadership must continue to explore solutions that push the boundaries of standard design. An integrated team can develop and refine the box girder to be distinctive and contextual.

Additional SDC design recommendations include:

- Allocate funding commensurate to the project's unique, dense location in order to produce an exceptional bridge.
- Stretch the bounds of the box girder design to create an elegant bridge that enhances its unique location, while achieving lightness and a contemporary appearance.
- Refine the strategy for the vertical elements to add visual interest and rhythm. However, do not detract from the horizontal character and contemporary expression of the bridge.
- While the bridge should enhance the context without mimicking its historical and natural elements, do not strip the bridge of all enhancements and leave a bare box girder bridge in an effort to be contemporary.

Montlake Lid

Context

Prior to the construction of SR 520, the Montlake neighborhood was a connected community of single-family homes bounded by the Montlake Cut and Portage Bay to the north and west and the Washington Park Arboretum to the south. Today, SR 520 isolates the Shelby-Hamlin neighborhood and former MOHAI site on the north from the rest of Montlake neighborhood to the south. The junction of SR 520 and Montlake Blvd E effectively places a freeway interchange in the middle of this residential neighborhood, interfering with bicycle and pedestrian traffic across the Montlake Cut to the University of Washington and the future light rail station.

Past SDC Input

The SDC provided recommendations on the Montlake Lid concept during the 2010 EIS process and 2012 Seattle Community Design process. In 2012, the SDC recommendations to WSDOT included:

- Maximize the qualitative and functionality of the lid space.
- Prioritize non-motorized connections.
- Provide activated open spaces.
- Enhance the user experience.
- Better integrate the program within the neighborhood and its context.

To achieve these recommendations, the SDC encouraged WSDOT and the City to explore diverse design options and scales that would focus on quality over quantity, reduce the reliance on disruptive mechanical equipment, increase benefits to users and neighbors, and provide better connectivity and impact mitigation.

Endorsement of the Montlake Lid Design Refinements

The SDC endorses WSDOT's refined concept design for a "smarter" lid. This approach identifies the desired goals that the lid should achieve and then, through thoughtful moves, maximizes the planning, engineering, and design of the project to meet or exceed these goals with an emphasis on quality over quantity. Through these investigations, WSDOT balanced the SR 520 tunnel size with project goals, eliminating the need for ventilation infrastructure and operations

and maintenance facilities. This resulted in a thinner, less invasive lid that could effectively be lowered by 15 feet.

Above all, the smarter lid concept achieves the following key benefits:

1. Enhanced regional connectivity
The smarter lid does not merely become a destination; the reductions in grade improve multimodal connections along the SR 520 corridor, across the Montlake Cut, and through the neighborhood. The primary north–south pedestrian and bicycle connection takes on a more direct alignment *above* rather than *beneath* the highway, at a lower slope, and with greater visual connection to the University of Washington. This allows the shoreline trail under SR 520 to become an overwater boardwalk with better visibility and connections to the Arboretum and Foster Island. Finally, the refined design improves on the previous east–west connections to, from, and across the lid.

2. More useable open space
The design and programming of open space in the refined concept focuses on quality usable spaces over quantity. The goal is to provide meaningful activity and not promote unintended uses. Spaces are functional, safe, and thoughtfully placed within the context of the neighborhood and the network of paths and trails. Lowering the lid height improves visibility and physical access and eliminates the need for large ventilation stacks that break up the open space and decrease its functionality.

The refined design goes beyond the lid and thoughtfully integrates the stormwater facility at the former MOHAI site as additional green space within East Montlake Park. This capitalizes on stormwater infrastructure and captures it as an element of the open space network that will extend north from the Arboretum toward the Montlake Triangle and Burke-Gilman Trail.

3. Enhanced view corridors
The project team studied grades and landscape elements to buffer views of the highway and control roadway noise. Lowering the overall height of the lid maintains visual connectivity throughout the neighborhood and from Lake Washington Blvd E.

4. Improved transit, bicycle, and pedestrian experiences
The design refinements improve the experience of pedestrians, cyclists, and transit users through better undercrossings, enhanced site design, and greater connectivity. The project team enhanced the pedestrian experience along Montlake Blvd E by expanding the lid to the west to create a larger vegetated buffer between pedestrians and SR 520 and shortening pedestrian crossings in this area.

Pathways across the lid were aligned to create convergence zones at two critical points: near Montlake Blvd E in the form of urban trailhead and where the landbridge meets 24th Ave E. This enhances non-motorized connections, improves transit access, and activates open space.

In addition, the concept refinements enhance the safety, functionality, and overall character of the Bill Dawson trail by easing the grades, adjusting the trail alignment, improving sightlines, and providing alternative routes.

5. Improved integration within the Montlake neighborhood fabric.
The reduced height, buffering of SR 520, and enhanced physical and visual connectivity of the smarter lid create more seamless connections with the neighborhood. The landbridge connection replaces the large retaining wall along the north side of SR 520 and creates an enhanced landscaped edge.

Moving east to west along the SR 520 corridor, the landbridge and lid create a series of thresholds that transition from the large landscape of Lake Washington to the urban fabric of the city.

Recommendations for Further Design Development
While the SDC is very encouraged by the changes resulting from the smarter lid approach, this approach also creates design challenges. As the SDC evaluated this updated approach, we also provided a number of key recommendations to guide WSDOT and the City in further development of the project.

1. Environment

- Strengthen the sustainability strategy for the project as a whole, particularly as it relates to stormwater, materiality, constructability and the integration of the project into our larger network of open space and habitat.

2. Enhance the Sequential Gateway Experience

- Consider the SR 520 as a succession of elements—the floating bridge, West Approach Bridge North, landbridge, Montlake Lid, Portage Bay Bridge, Delmar Lid—that together create a larger gateway experience as one moves into or out of our City. Consider the Montlake Lid as part of this series of thresholds and clarify how it fits within that context. The sequence of the landbridge and tunnel should work together to create this threshold experience. Consider materiality, movement through the tunnel, and the moment of emerging from under a structure to see Foster Island or Portage Bay.
- In addition to east–west movement, consider the experience of thresholds moving north to south along Montlake Blvd E and throughout the network of paths on the lid and landbridge.

3. Strengthen Connectivity and Wayfinding

- Develop a clear hierarchy for the paths and trails that transect the lid. This hierarchy should be weighted to clearly indicate how paths connect to nearby and regional destinations. Consider how people will connect to the Burke-Gilman Trail, Arboretum, and future transit hub at the Montlake Triangle.
- Continue to study grades, visual connections, desire lines, and buffers between bicyclists, pedestrians, and vehicular traffic. Pay particular attention to the pinch points where 24th Ave E crosses Lake Washington Blvd E and where the Bill Dawson Trail connects to E Roanoke St.

4. Landbridge

- Continue to study the landbridge typology. The bridge profile should be unique and expressive without resembling typical highway infrastructure. Topography and vegetation should provide a unique experience from all angles.
- Resolve where the landbridge connects to the land at both ends and how it emerges from the landscape. On the deck of the landbridge, explore widening the east edge to provide adequate width for generous landforms and vegetation. Continue to develop moments for pause and views, and provide opportunities to look eastward towards Lake Washington.

5. West Lid

- The “urban trailhead” area works as a strong placemaking gesture. Its success, however, is crucial to the function of the lid as a hub within the city. It will be important to proactively develop the kiosks and program the space to activate it and achieve the desired civic outcomes.
- Continue to focus on developing quality public space, especially at the west end of the lid. Provide a good experience for non-motorized users moving across the lid and along 24th Ave E. To that end, consider increasing the amount of lid on the east side of Montlake Blvd E at 24th Ave E.

6. Montlake Boulevard

- Give as much attention to the design articulation of the west side of Montlake Blvd E as to the east side. This is a major non-motorized route that links transit to the north with the heart of Montlake to the south. It is also a desire line between Capitol Hill and the UW.
- Work with the property owner of the gas station site at Montlake Blvd E and Lake Washington Blvd E to win space for transit users, cyclists, and pedestrians.
- Continue to explore the idea of providing a bike and pedestrian bridge over the Montlake Cut at a point close to where 24th Ave E would transect the waterway. This would strengthen the connective function of the landbridge within the larger north–south continuum between the Arboretum and the University of Washington. The SDC has not thoroughly analyzed the question of a second bascule bridge, but in 2010 we recommended that, if constructed, the second bascule bridge be limited to pedestrian, cyclist, and transit use. A separate pedestrian/bicycle bridge over the Cut further east would help alleviate pressure for a crossing close to the existing historic bridge. It would also relieve pressure on Montlake Blvd E between SR 520 and the Montlake Triangle.

7. Ramps to Nowhere

Though not part of this review or our review of the West Approach Bridge North, the SDC supports the idea of retaining a part of the “ramps to nowhere” at the Arboretum that are slated for removal.

The ramps to nowhere are existing structures that relate to former plans to extend a freeway through the Arboretum and the successful fight to stop those plans. The ramps represent an important time in Seattle’s history and express a key personality trait of our city. Furthermore, their presence has created unique experiences from the “unauthorized” pedestrian access to the ramps, providing elevated views of the lake and opportunities to jump into the water. This attracts spectators regularly. The structures provide an interesting sense of scale and a unique contrast between the softness of nature and hardness of infrastructure. The ramps to nowhere offer thought-provoking irony and ties to our history that, with further public art interventions

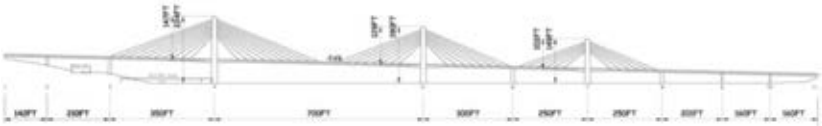
and safety and access improvements, could preserve and strengthen this extraordinary place in the history of our city.

We recommend that the State and City explore the idea of retaining part of the ramps to nowhere. They are located where plans are underway to expand recreational use as part of the Arboretum North Entry project. There is an important opportunity to enrich that design of that project with these socially significant relics of the past.

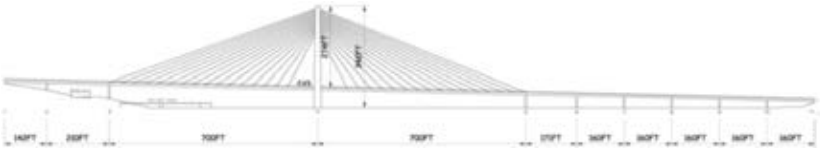
In closing, the SDC greatly appreciates the time and commitment that WSDOT and the City have made in presenting this project. As the project proceeds, we look forward to continued involvement.

CC: Diane Sugimura, DPD Director
Scott Kubly, SDOT Director
Nathan Torgelson, DPD Deputy Director
Lyle Bicknell, DPD
Bernard Van De Kamp, SDOT
Kerry Pihlstrom, WSDOT

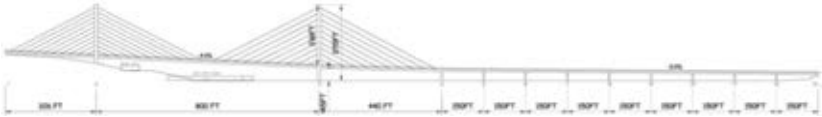
Attachment A
Cable stay bridge designs presented to the SDC



July 8, 2014 – three towers of varied heights (102, 129, and 147 feet above bridge deck) and uniform 2.6% grade



June 17, 2014 – one tall tower (274 feet above bridge deck) and uniform 2.6% grade



FEIS Baseline Design – two towers of equal height (each 216 feet above bridge deck)

Attachment B
Box girder bridge designs presented to the SDC

July 8, 2014

June 17, 2014

FEIS Baseline Design

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APPENDIX F

WEST SIDE OPERATIONAL REQUIREMENTS AND COMMITMENTS

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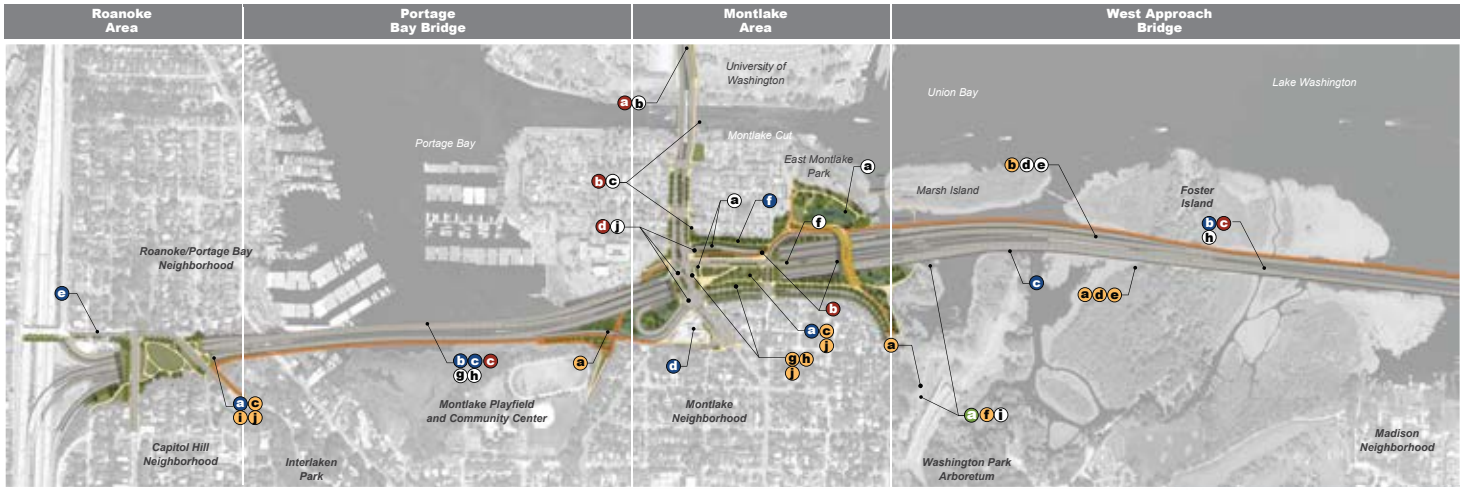
APPENDIX F

WEST SIDE OPERATIONAL REQUIREMENTS AND COMMITMENTS (per FEIS including Section 106)*



Neighborhoods

- √ Narrow the footprint of the corridor through the neighborhoods.
- √ Minimize impacts to neighborhoods during construction.
- a Add lids to reconnect neighborhoods.
- b Incorporate aesthetic treatment on bridge structures and engage Context-Sensitive Solutions approach.
- c Reduce noise to the extent possible by using noise walls, noise barriers and other innovative methods.
- d Minimize impacts on the Montlake Market grocery store.
- e Enhance bicycle and pedestrian connection over I-5.
- f Re-establish a visual buffer on or adjacent to the remaining Canal Reserve lands.

√ = applicable project-wide

Natural Environment

- √ Treat stormwater to meet current stormwater design and treatment standards.
- √ Minimize emissions and provide incentives for transit riders.
- √ Minimize impact to fish and wildlife habitat and mitigate effects.
- √ Retain as much mature vegetation as possible.
- a Remove existing R.H. Thomson and Lake Washington Boulevard ramps.

Mobility

- √ Build a six-lane configuration with 4 general-purpose lanes and two transit/HOV lanes with narrower shoulders.
- a Provide efficient connections for buses to/from the U-LINK station and SR 520.
- b Provide grade-separated pedestrian crossing to U-LINK station.
- c Improve bicycle and pedestrian connection at the Montlake/SR 520 interchange and across the Montlake Cut.
- d Build a structure that accommodates future light rail transit.
- e Provide bicycle and pedestrian connections across Lake Washington.
- f Provide direct-access transit/HOV ramps to/from the east to Montlake.
- g Narrow width, lower height and incorporate a managed shoulder on Portage Bay Bridge.
- h Reduce the number of in-water bridge columns.
- i Replace Lake Washington Boulevard ramp function with managed access at 24th Avenue.
- j Remove free right vehicle turning movements and replace with signalization.

Parks and recreation

- √ During construction, minimize effects to Opening Day of boating season.
- a Minimize effects on the Arboretum and other parklands adjacent to the corridor.
- b Provide canoe access underneath SR 520 in Union Bay.
- c Add lids to provide open space.
- d Minimize impacts to the historical Foster Island.
- e Revegetate right-of-way on Foster Island with native vegetation of ethnobotanical significance to affected tribes.
- f Remove existing R.H. Thomson and Lake Washington Boulevard ramps.
- g Ensure that changes to Lake Washington Boulevard consistent with the City of Seattle Olmsted park furniture standards.
- h Reflect the historical connection between Montlake Boulevard and Lake Washington Boulevard, including Olmsted design principles in Montlake lid plantings.
- i Design 10th and Delmar lid to be compatible with Roanoke Park Historic District and incorporate Olmsted characteristics.
- j Provide signage about the Alaska-Yukon-Pacific Exposition, the evolution of Olmsted design and Montlake Boulevard and Roanoke, and the effects of SR 520 on that landscape.

Safety

- √ Move forward with the replacement of SR 520 as a six-lane corridor.
- √ Provide sufficient space for stalled vehicles and emergency access along the corridor.
- a Provide grade-separated pedestrian crossing to U-LINK station.
- b Improve bicycle and pedestrian connection at the Montlake/SR 520 interchange and across the Montlake Cut.
- c Replace vulnerable structures.
- d Remove free right vehicle turning movements and replace with signalization.

* **NOTE:** A complete list of project requirements and commitments can be found in the SR 520 ***Final Environmental Impact Statement*** (2011) and the ***Record of Decision*** (2011). See also the ***Section 106 Programmatic Agreement*** in the Final EIS. http://www.wsdot.wa.gov/Projects/SR520Bridge/EIS.htm

City of Seattle Washington State Department of Transportation

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APPENDIX G
REFERENCE DOCUMENTS

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APPENDIX G

REFERENCE DOCUMENTS

Seattle Design Commission Memorandum: Recommendations for the Portage Bay Bridge and Montlake Lid components of the SR 520 Replacement Project
September 17, 2014
http://www.seattle.gov/dpd/cityplanning/designcommission/cs/groups/pan/@pan/@designcommission/documents/web_informational/p2194279.pdf

WSDOT Toll Division Annual Report FY 2013
March 2013
http://www.wsdot.wa.gov/NR/rdonlyres/348E3EED-1D8F-44CC-AC1E-2A9EBD45774F/0/TollDivisionAnnualReport_FINAL_031114_WEB.pdf

Seattle Community Design Process Final Report
December 20, 2012
http://www.wsdot.wa.gov/projects/sr520bridge/i5tomedina/scdp.htm#KeyReports

http://www.wsdot.wa.gov/NR/rdonlyres/A22AD830-500A-46C1-B6A7-9D0F9FD54ED9/0/2012_1220_SR520_FinalReport_11x17_OneFile.pdf

Establishment of Triggers: Second Montlake Bridge Workgroup
June 2012
http://seattletransitblog.com/wp-content/uploads/2012/09/FinalReport2ndBasculeBridgeWithAttachments.pdf

Seattle Community Design Process Public Comment Summary
November 2011
http://www.wsdot.wa.gov/projects/sr520bridge/i5tomedina/scdp.htm#KeyReports

http://www.wsdot.wa.gov/NR/rdonlyres/DD9C4D99-7061-40C4-B55C-C60E8CF49C14/0/2012_SCDP_CommentPeriod_FullSummary_Final.pdf

SR 520/City of Seattle Memorandum of Understanding
Oct. 28, 2011
http://clerk.seattle.gov/~scripts/nph-brs.exe?s1=&s3=117303&s4=&s2=&s5=&Sect4=AND&l=20&Sect2=THESON&Sect3=PLURON&Sect5=CBORY&Sect6=HITOFF&d=ORDF&p=1&u=/~public/cbory.htm&r=1&f=G

Record of Decision
August 2011
http://www.wsdot.wa.gov/Projects/SR520Bridge/EIS.htm#ROD

SR 520, I-5 to Medina Project Final Environmental Impact Statement (FEIS)
June 2011
http://www.wsdot.wa.gov/Projects/SR520Bridge/EIS.htm#FEIS

SR 520 Bridge Architectural Design Principles
January 2011
http://www.wsdot.wa.gov/NR/rdonlyres/D7F6D0AB-377B-49FF-A56A-9EB5BD0CFB78/0/SR520_FBL_Appendix_L02_01_Addm04.pdf

ESSB 6392 Workgroup (ESSB 6392: Design Refinements and Transit Connections Workgroup: Recommendations Report and Washington Park Arboretum Mitigation Plan)
October 1, 2010 and December 22, 2010
http://www.wsdot.wa.gov/NR/rdonlyres/71503308-669C-4FCC-BFA3-5F3CCAB11F80/0/2010_1001_WG_LegReport_Final.pdf

http://www.wsdot.wa.gov/NR/rdonlyres/91999CA6-DCEB-41BA-91ED-D8DEDDE87EE2/0/ArboretumMitigationPlan_FINAL_122210.pdf

Supplemental Draft Environmental Impact Statement
January 22, 2010
http://www.wsdot.wa.gov/Projects/SR520Bridge/EIS.htm#SDEIS

Westside Project Impact Plan (or ESSB 6099 report)
December 2008
http://www.wsdot.wa.gov/NR/rdonlyres/FD796AFD-25DC-4D76-807E-F74D7F818F1E/0/FINALSR520PIP122908.pdf

Draft Environmental Impact Statement
August 11, 2006
http://www.wsdot.wa.gov/Projects/SR520Bridge/DraftEIS.htm

Seven 'S' of Olmsted's Design
January 1986
http://www.olmsted.org/the-olmsted-legacy/olmsted-theory-and-design-principles/seven-s-of-olmsteds-design

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APPENDIX H

COMMUNITY ORGANIZATION LETTER SUMMARIES

APPENDIX H

COMMUNITY ORGANIZATION LETTER SUMMARIES

The pages that follow provide summaries of letters received from community organizations and other organizations regarding the 2014 design work, including concepts shared at Seattle Design Commission briefings, Seattle City Council Transportation Committee briefings, and the Sept. 11 SR 520 West Side Design Public Open House. Letters are listed by date received and highlight key feedback regarding the design concepts explored in 2014.

Respect Seattle (7/17/14):

General

- Support WSDOT receiving full funding for the Seattle side of the SR 520 corridor before any construction begins. Support completion of all mitigation projects included in the SR 520, I-5 to Medina EIS.
- Support noise-reduction measures, including noise-absorptive material on highway medians, coated expansion joints, and quieter pavement.
- Traffic impacts continue to be a concern, and the new design should help improve traffic conditions for Seattle residents.

Non-motorized connections

- Bicycle and pedestrian connections should be seamless.

Portage Bay Bridge

- Support the box girder bridge type. The box girder bridge type allows for more views above the bridge deck, is more compatible with the surrounding neighborhood and historic character and is more cost-effective.
- The bridge design should be consistent with the Olmsted legacy.

Montlake area

- Support reducing the span of the lid in order to eliminate the need for ventilation stacks. Suggest that the span of the lid expand to cover the off-ramps to Montlake Boulevard East.
- Maintenance of the lid needs to be determined.

Montlake Greenways, Madison Greenways, Central Seattle Greenways (9/11/14):

(supported by Seattle Neighborhood Greenways and Cascade Bicycle Club)

General

- The project design is improved, although additional design work is needed.

Montlake area

- Create a direct and comfortable bicycle and pedestrian connection for users of all ages and abilities extending from the Central Area greenway to the University of Washington Medical Center on the west side of Montlake Boulevard East.
- Improve bicycle and pedestrian access across the Montlake Cut.
- Support a bicycle and pedestrian-only bridge across the Montlake Cut.
- Reclaim Montlake Boulevard East as part of the Olmsted legacy.
- Support a multi-use trail, expanded sidewalk and a protected bike lane.
- Prevent cut-through traffic in the Montlake neighborhood while at the same time creating safe routes to schools, parks, transit stops, and business districts. Key locations for specific improvements are listed.

Roanoke area

- Create a seamless, comfortable connection from the regional shared-use path on the Portage Bay Bridge to Federal Avenue East and 10th Avenue East for bicyclists and pedestrians of all ages and abilities.
- Provide a protected bike lane along Delmar Drive East and East Roanoke Street between the Portage Bay Bridge Trail and the Capitol Hill and Eastlake neighborhoods.

Portage Bay/Roanoke Park Community Council (9/11/14):

Portage Bay Bridge

- Request that the bridge design is compatible with the context of the surrounding districts and that modern concepts are avoided.
- Preference for the box girder bridge type.
- Request that the community efforts to make the under-bridge area at Boyer Avenue East safe are continued once the new bridge is constructed. The under-bridge area should be activated with lighting and the design of the area should be conducive to active uses.
- Request that the arch over Boyer Avenue East receive special design attention. The arch could represent a welcoming portal to the Montlake and Portage Bay/Roanoke Park neighborhoods.

Seattle Design Commission (9/17/14)

(See Appendix I for the complete text of the memorandum.)

Vision and goals

Support WSDOT's vision and goals for the SR 520 corridor in Seattle, which should be used as reference points for evaluating the project design.

Process

- Appreciate WSDOT's continued coordination with the Seattle Design Commission and look forward to continued participation as the SR 520 project moves forward.
- Encourage WSDOT and the city of Seattle (including the Departments of Transportation and Planning and Development) to continue working together to integrate the SR 520 project design within the city of Seattle. The city should remain a proactive partner.
- Request that WSDOT continue its integrative approach to project design with urban design at the center of the design development.

Corridor-wide

- Strengthen the project's sustainability strategy, including stormwater, materiality, constructability and the integration of open space and natural habitat.
- Enhance the sequential gateway experience across the SR 520 corridor and the integration of individual project elements within that context (east-west). Also consider the north-south experience.
- Strengthen connectivity and wayfinding, including clearly indicating how paths on the Montlake lid will connect to nearby and regional destinations. Continue to study grades, visual connections, desire lines and buffers between bicyclists, pedestrians and vehicles.

Other

- Support retaining a part of the Ramps to Nowhere, including opportunities to integrate the ramps into the Arboretum North Entry project.

Portage Bay Bridge

- Appreciate the continuation of the regional shared-use path across Portage Bay Bridge as well as WSDOT's effort to reduce the overall width of the bridge, including reducing lane widths.
- The new Portage Bay Bridge must be both a distinctive and context-sensitive element within the family of SR 520 bridges. The bridge should appear elegant, light, and enhance the unique character of Portage Bay. Guidance for specific bridge elements is provided in the memo.
- The cable stay bridge is not the most compelling option for Portage Bay.
- The box girder bridge has the greatest potential for success in Portage Bay. In order to meet the project vision and goals, a box girder must be well-funded and well-designed in order to fit within the context of Portage Bay and the surrounding area.
- WSDOT should continue to use an integrated team of architects and urban designers to refine the bridge design and explore solutions that push the boundaries of standard design to develop a bridge that is distinctive and contextual.

Montlake lid area

- Endorse the "smarter lid" concept and the emphasis on quality over quantity. The smarter lid achieves the following benefits (specific examples are provided in the memo):
  - Enhanced regional connectivity.
  - More usable open space.
  - Enhanced corridor views.
  - Improved transit, bicycle, and pedestrian experiences.
  - Improved integration within the Montlake neighborhood fabric.
- Continue to study the typology of the land bridge. It should be unique and expressive. Also, further evaluate how the land bridge connects on both ends and opportunities for viewpoints and vegetation.
- Activate the urban trailhead and provide a good experience for non-motorized users traveling across the lid. Consider expanding the lid east at 24th Avenue East.
- Ensure quality design on both the east and west sides of Montlake Boulevard East, and continue to look for opportunities to improve bicycle and pedestrian facilities in the area.
- Continue to evaluate a separate bicycle and pedestrian bridge over the Montlake Cut to the east of the existing bridge. If a second bridge is built adjacent to the existing bridge, it should be for cyclist, pedestrian, and transit use only.

Montlake Community Club Board of Trustees (9/18/14):

Montlake area

- Support the reduction of the lid size, which eliminates the need for ventilation stacks and an operations and maintenance facility.
- Support widened sidewalks on Montlake Boulevard East.
- Support the traffic signal at the intersection of the SR 520 off-ramps to northbound Montlake Boulevard East and the additional lane on the eastbound off-ramp at Montlake Boulevard East. Also support the additional lane on the eastbound off-ramp at the exit of Montlake Boulevard East.

Non-motorized connections

- Support the wide bicycle and pedestrian paths on the Montlake lid to connect the Shelby/Hamlin neighborhood to the southern portion of the Montlake area.
- Support improvements to the Bill Dawson Trail, including connections to the 22nd Avenue East greenway and the SR 520 regional shared-use path.
- Support a new bicycle and pedestrian bridge across the Montlake Cut to the east of the existing bascule bridge.
- Support a new path from the Bill Dawson Trail along the Portage Bay shore, extending between NOAA Northwest Fisheries Science Center and the Seattle Yacht Club to connect to West Montlake Park and the western portion of the Shelby/Hamlin neighborhood.
- Additional north-south bicycle and pedestrian improvements are needed for the west side of Montlake Boulevard East. Separating bicyclists and pedestrians from traffic on Montlake Boulevard East is a priority for the community.

Seattle Pedestrian Advisory Board (9/23/14):

Non-motorized connections

- The final concept design shows improved neighborhood non-motorized connections and regional connections to major employment, education and recreational destinations.
- The urban trailhead provides safer, friendlier, and more intuitive pedestrian crossings, connections and shared-use paths that can help accommodate all non-motorized users. It also maintains and improves transit connectivity.
- The refinements to the amount of infrastructure and associated mechanical and maintenance systems will greatly improve the bicycle and pedestrian experience and environment.

Queen City Yacht Club (10/14/14):

General

- Support preserving the character of the neighborhoods surrounding SR 520.

Portage Bay Bridge

- Support the north shift of the west end of the bridge to help reduce the construction duration of the Portage Bay Bridge, provided that WSDOT works with the Queen City Yacht Club to ensure that construction effects are appropriately addressed and that the operation of the Club can continue after the bridge is constructed.
- Interest in ensuring that a Community Construction Management Plan is developed prior to construction beginning in the area and would like to remain involved as the plan is developed.

Northeast District Council (10/15/14):

Portage Bay Bridge

- Support Sept. 11, 2014 letter from the Portage Bay/Roanoke Park Community Council regarding the Portage Bay Bridge design plans.
- Portage Bay Bridge should preserve continuity between the historic districts of the Portage Bay and Roanoke neighborhoods.
- The under-bridge area should be activated with welcoming lighting and design. The arch over Boyer Avenue East should receive special design attention.

Arboretum and Botanical Garden Committee (10/28/14):

Montlake area

- Support the reduced size of the lid, elimination of the operations and maintenance facility, creation of better connections between the University of Washington campus, the Washington Park Arboretum and surrounding neighborhoods and improvements to the character and usability of open space on the lid.
- Request that WSDOT and the project design team consider the following key elements as the design is finalized:
  - Continue the historical, aesthetic and design integrity of the Washington Park Arboretum within the SR 520 project.
  - Use high-quality design standards and materials, and take advantage of educational opportunities. Ensure that the design of project elements, including the land bridge, is not compromised by budget constraints.
  - Provide comprehensive and well-integrated wayfinding systems on bicycle and pedestrian networks.
  - Strengthen connections between the University of Washington Link Light Rail station and the Arboretum.

APPENDIX I

SEATTLE CITY COUNCIL RESOLUTION 31427

APPENDIX I

SEATTLE CITY COUNCIL RESOLUTION 31427

City of Seattle Legislative Information Service

Information retrieved on May 8, 2014 9:11 AM

Resolution Number: 31427

A RESOLUTION relating to the State Route 520 Interstate 5 to Medina Bridge Replacement and High Occupancy Vehicle Project; recognizing the completion of the Seattle Community Design Process and recommending actions by the City of Seattle and State of Washington based on results of this process.

Status: *Adopted*
Date adopted by Full Council: *February 11, 2013*
Vote: *8-0 (excused: Clark)*

Date introduced/referred to committee: *January 22, 2013*
Committee: *SR 520*
Sponsor: *CONLIN*
Committee Recommendation: *Adopt as Amended*
Date of Committee Recommendation: *February 4, 2013*
Committee Vote: *9-0*

Index Terms: *SR-520, HIGHWAYS, BRIDGES, MEDINA, INTERLOCAL-AGREEMENTS, DEPARTMENT-OF-TRANSPORTATION-WASH-STATE, TRANSPORTATION-PLANNING, REGIONAL-PLANNING*

References/Related Documents: *Related: Ordinance 123733*

Fiscal Note: *Fiscal Note to Resolution 31427*

Electronic Copy: *PDF scan of Resolution No. 31427*

Text

CITY OF SEATTLE

RESOLUTION _____

A RESOLUTION relating to the State Route 520 Interstate 5 to Medina Bridge Replacement and High Occupancy Vehicle Project; recognizing the completion of the Seattle Community Design Process and recommending actions by the City of Seattle and State of Washington based on results of this process.

WHEREAS, Ordinance 123733, passed in October 2011, authorized execution of a Memorandum of Understanding (MOU) between the Washington State Department of Transportation (State) and the City of Seattle (City) regarding State and City roles, responsibilities and future actions in the State Route 520 Interstate 5 to Medina Bridge Replacement and High Occupancy Vehicle Project (Project); and

WHEREAS, Section 2.3.5 of the MOU stated that the State and City intended to coordinate with City neighborhoods, King County Metro, Sound Transit, the University of Washington, the Seattle Bicycle Advisory Board, the Seattle Pedestrian Advisory Board and the Seattle Design Commission in a Seattle Community Design Process (Process) for community amenity and lid design features within the Project limits; and

WHEREAS, the State organized and led the Process as intended by the MOU, consistently with the Preferred Alternative and baseline design features and environmental footprint of the Project as approved by the Federal Highway Administration's Record of Decision; and

WHEREAS, in September 2012 the State issued a draft report on the results of the Process and solicited public comments on the report, in October 2012 issued a report on the public comments received, and in December 2012 issued the Final Report on the Process; and

WHEREAS, in October and November 2012 , the State briefed the City Council on the Process and these reports, and the Council itself received public comments on the Process and on the design recommendations resulting from it; and

Washington State Department of Transportation City of Seattle

WHEREAS, Section 1.1.5 of the MOU calls for the City to maintain a meaningful role throughout the Project design process, Section 2.1.15 says the State will consult with the Seattle Design Commission, Seattle Bicycle Advisory Board, Seattle Pedestrian Advisory Board, and City neighborhood groups on design and construction of the Project as necessary or requested by the Parties, and Sections 2.3.3, 2.3.4 and 2.3.5 say the State and the City will continue to consult with community members on a variety of aspects of the Project design; NOW, THEREFORE

BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF SEATTLE, THE MAYOR CONCURRING, THAT:

Section 1. The City recognizes that the Seattle Community Design Process (Process) intended by Section 2.3.5 of the Memorandum of Understanding (MOU) between the Washington State Department of Transportation (State) and the City authorized by Ordinance 123733 is complete and fulfills the intent of that section of the MOU.

Section 2. The City endorses the general vision expressed in the December 2012 Final Report on the Process (Report) and concurs with the following specific recommendations from the Report, as they are described in the Report:

A. Roanoke Area

(1) A 30-foot wide landscaped bicycle and pedestrian shared use path should be constructed across Interstate 5.

(2) The intersection of 10th Avenue East and Delmar Drive East should have a "T" design.

(3) The lid at 10th Avenue East and Delmar Drive East should be blended into the hillside on the south side and should include bicycle and pedestrian paths, while ensuring safe public spaces and privacy for adjacent neighbors.

(4) There should be an accessible pedestrian connection between Delmar Drive East and Boyer Avenue East.

B. Portage Bay Bridge

(1) In order to reduce the time required to construct the Portage Bay Bridge, the west end of the bridge should be shifted to the north from the position described in the Preferred Alternative in the Final Environmental Impact Statement on the Project provided that the State works with the Queen City Yacht Club to ensure that any effects to the Club during construction are appropriately addressed and that operation of the Club (including Dock 3) can continue after the bridge is constructed. The City requests that the State continue to consult with the Seattle Design Commission, Seattle Bicycle Advisory Board, Seattle Pedestrian Advisory Board and neighborhood residents on the specific design and impacts of the shift.

C. Montlake Area

(1) In the Canal Reserve area, the westbound off-ramps under 24th Avenue East should be lowered and the shared-use path should be shifted to the south.

(2) East Lake Washington Boulevard should be designed so that neighbors are buffered from traffic, the appearance of the roadway is improved, and the size of the planted buffer between the roadway and homes on the south side is increased in order to integrate the roadway with the Arboretum.

(3) At the stormwater facility, a wetland facility should be constructed that is integrated with East Montlake Park and the shoreline.

Section 3. The City and State should continue to develop and evaluate options with respect to the following issues and recommendations in the Final Report:

A. Roanoke Area

(1) The Bagley Viewpoint should be expanded if possible, and should include significant green space and provide unobstructed views. The City and State should continue to review the adequacy of on-street parking along Delmar Drive East to meet demand for use of the viewpoint and the lid at Delmar Drive East and 10th Avenue East.

B. Portage Bay Bridge

(1) The City supports providing a bicycle and pedestrian path on the Portage Bay Bridge. The City also continues to support a bridge design that minimizes the width of the bridge and its overall visual and environmental impacts while preserving a reliable transit pathway across the bridge and to and from Interstate 5. Further, the utility of a bicycle and pedestrian path on the bridge requires good quality connections at the ends of the bridge to the network for bicycle and pedestrian travel. Thus the City requests that the State develop options for a path on the bridge with these goals in mind and cooperate with the City in developing options for related improvements to the network.

(2) The City requests that the State continue to refine and analyze the two options for bridge type, namely, box girder and cable stay. This should include reviewing and if necessary updating the engineering assumptions for each type, continuing to

evaluate options to minimize the width and overall visual impact of each, developing options for including a bicycle and pedestrian path in each, and refining cost estimates for each accordingly. The City requests that the State discuss these options with and consider the views of the Seattle Design Commission in this analysis.

C. Montlake Area

(1) The City and State should reexamine and consider a wider range of options for the Montlake Lid. This analysis should consider how the lid can best support connections for pedestrians, bicyclists and transit users, including uninterrupted connections across the lid and westbound SR 520 off-ramps. It should consider how the lid can best reduce the impacts of roadway sound and make good visual connections among the neighborhoods. It should consider how alternative lid designs can best support active and passive uses of the lid itself, and should define the requirements for managing the space on the lid to support and ensure positive uses. It should estimate the costs of these options. The City and State should solicit the advice of the Seattle Design Commission on these options.

(2) The City and State should refine the designs of and connections currently provided by the Bill Dawson Trail and East Portage Bay Underbridge Area to make these connections direct, safe and comfortable.

D. Bicycle, pedestrian and multimodal connections generally

(1) The City and State should continue to pursue improvements in bicycle and pedestrian connections for people of all ages and abilities in the entire area covered by the Process and Report, including Montlake Boulevard. This includes improving the functionality, safety and attractiveness of bicycle and pedestrian facilities by creating clear and seamless routes and making good connections to transit and existing and planned trails and neighborhoods surrounding the area.

(2) The City and State should collaborate with King County Metro, Sound Transit and the University of Washington to refine multimodal connections to and within the State Route 520 corridor. These refinements should be consistent with existing and prospective plans for transit and for bicycle and pedestrian routes, and should consider access, mobility and safety, with the overall goals of eliminating gaps in the system and maintaining and enhancing existing networks in the city.

Section 4. The City requests that the State construct the West Approach Bridge following the design recommendations in the Report and those of the Seattle Design Commission. This includes a simple, clean structural design with a regional bicycle and pedestrian path. Consistent with the Report, the bridge should be constructed on the assumption that access to East Montlake Park from 24th Avenue East will be limited to bicycles and pedestrians.

The City also requests that the State develop an interim design for the connection between the West Approach Bridge and the Montlake Area, including all transportation connections and connections among open spaces in the Area. The interim design would have several purposes. One is to ensure that these connections work as well as possible in the interim period between the construction of the bridge and the funding, design and construction of the other transportation improvements and related amenities in the Area. Another is to ensure that the choices necessarily made in the construction of the bridge do not unduly constrain the options for the other transportation improvements and amenities in the area, including but not limited to the Montlake Lid. A third is to ensure that the impacts of the bridge and the Project as a whole on the neighborhood and the community are adequately mitigated in the interim period.

Section 5. The City intends to implement two general recommendations of the Seattle Design Commission for the subsequent design processes in the Project area. These are that the City assign a "Champion" as a single coordinating voice for the Project across all City departments and that the Commission itself have ongoing involvement in these designs.

Section 6. The City requests that prior to finalizing the design for the Portage Bay Bridge the State consider changed conditions that may affect performance for all modes of transportation and review this information with the City.

Section 7. The City urges the State Legislature to provide sufficient funding to the State Department of Transportation for its share of the work described in Sections 1-4 of this Resolution. This includes funding the development of additional information that is necessary and sufficient for these design decisions, and funding the development of any required design refinements when construction funding is available.

Adopted by the City Council the ____ day of _____, 2013, and signed by me in open session in authentication of its adoption this_____ day

of _____, 2013.

_____

President _____of the City Council

THE MAYOR CONCURRING:

_____

Michael McGinn, Mayor

Filed by me this ____ day of _____, 2013.

_____

Monica Martinez Simmons, City Clerk

(Seal)

Michael Fong, Peter Harris LEG SR 520 Seattle Community Design Process RES February 6, 2013 Version #4

DOCUMENT CREDITS

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