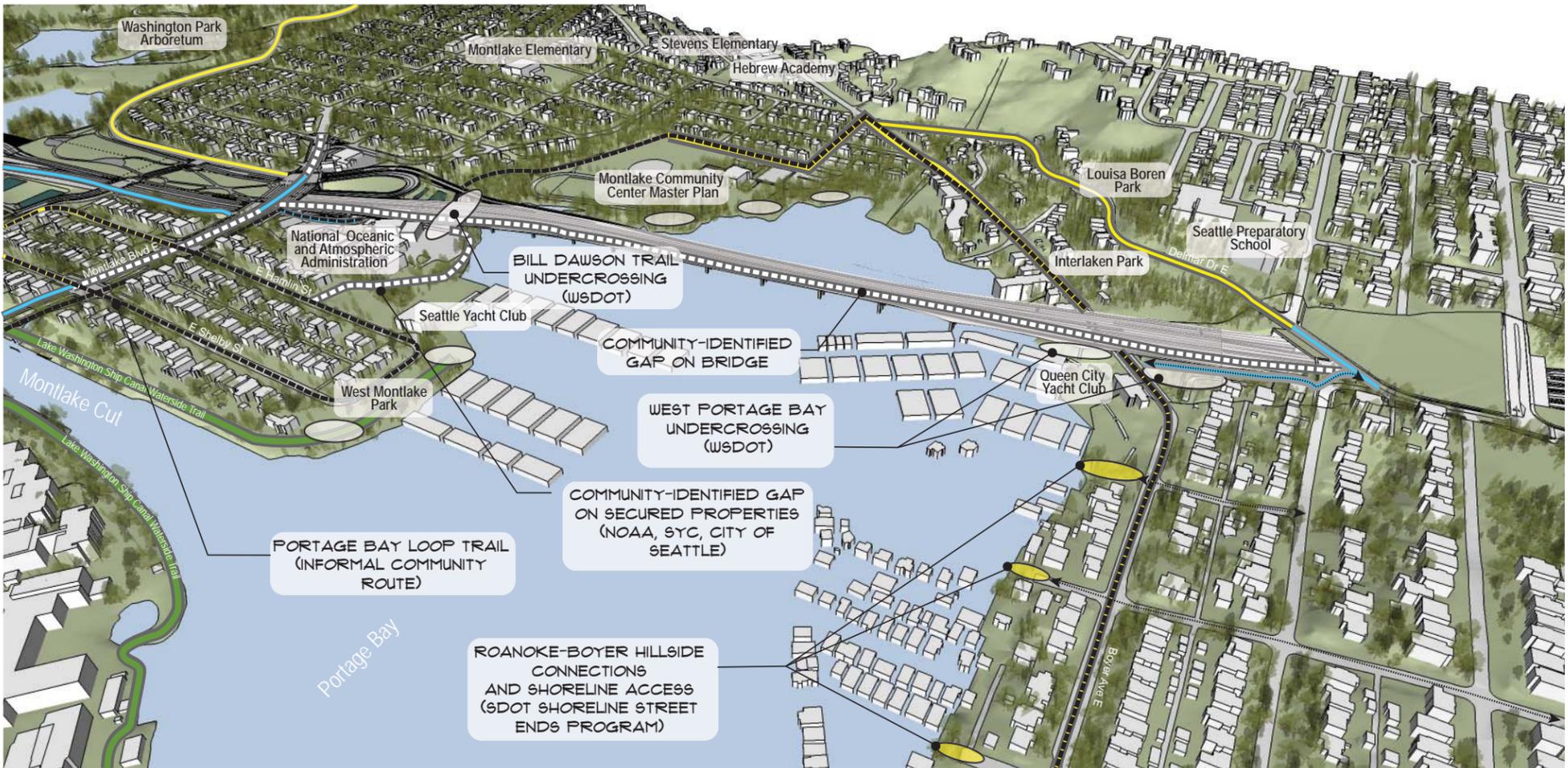
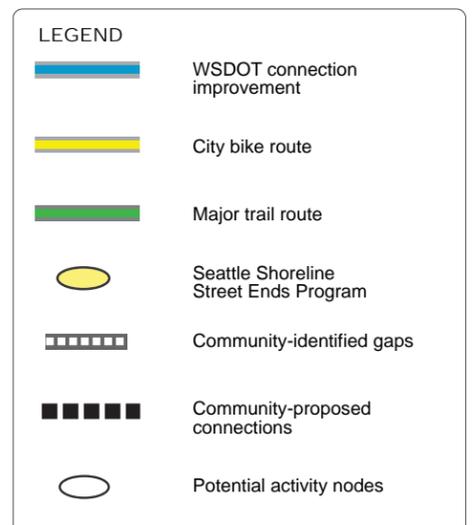


Portage Bay community loop opportunities



What we heard

- Create safe places under bridges with connections and activities.
- Consider a bike/pedestrian path on Portage Bay Bridge and integrated with 10th and Delmar lid.
- Provide better signage and wayfinding for cyclists.
- Provide bike lane on Portage Bay Bridge.
- Make Bill Dawson Trail straighter and less cramped; keep bikes and pedestrians separate.
- Keep the loop trail around Portage Bay in mind as trails/paths are developed with connections to the Arboretum.
- Create a continuous green linkage from the Montlake lid to Montlake Playfield and 10th and Delmar lid.
- Create a continuous trail connecting Portage Bay kayak launch, Bill Dawson Trail, Seattle Yacht Club, West Montlake Park, and Arboretum Waterfront Trail.



Design opportunities

- Create a continuous, green connection around Portage Bay by building on the existing formal and informal trail infrastructure.
- Work with appropriate agencies and community groups to coordinate and develop better signage and way-finding.
- Connect places by emphasizing destinations and through-ways.

Selecting a bridge type

Major bridge types

Beam Bridge

The modern version of a felled tree trunk spanning between two rocks, a beam bridge consists of steel or concrete beams (also called girders) between piers which are spaced at regular intervals.

Appropriate span length: 20 – 400 ft.

Applicability for west side project: Suitable bridge type for most conditions.

Arch Bridge

The arch bridge uses a curve made of either steel or concrete to transfer some of the weight of the bridge and vehicles to the foundations at either end.

Appropriate span length: 30 – 1,200 ft.

Applicability for west side project: Not appropriate for curved or variable width bridges. Foundation requires a substantial size to resist outward thrust.

Truss Bridge

Truss bridges use thin steel members arranged in triangles to extend span lengths over beam bridges. Long spans can be achieved by increasing the overall depth without drastically increasing the weight of the materials.

Appropriate span length: 300 – 1,200 ft.

Applicability for west side project: Not appropriate for curved or varying width bridges.

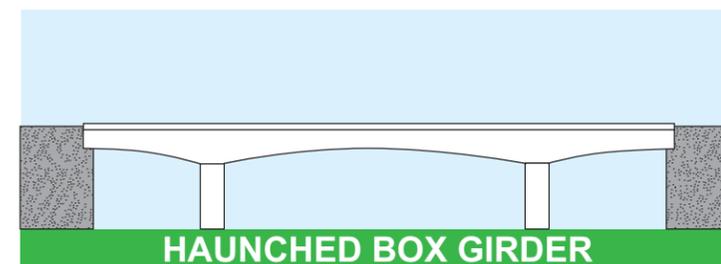
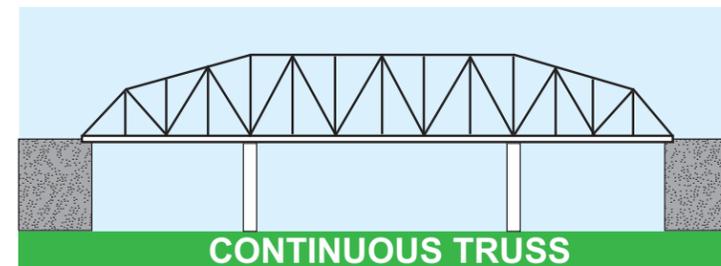
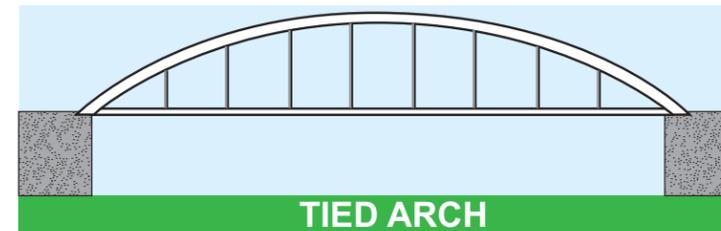
Box Girder Bridge

A box girder bridge is similar to a beam bridge but the girders and deck are combined in a single trapezoidal, or rectangular hollow section. Often times the hollow sections are built off-site and erected segmentally using a traveler system.

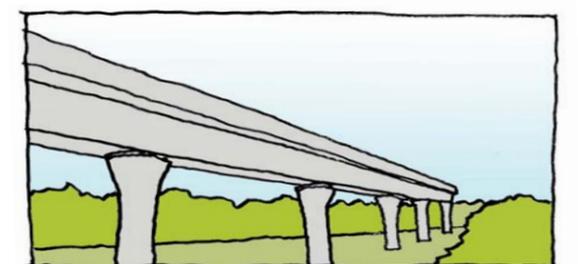
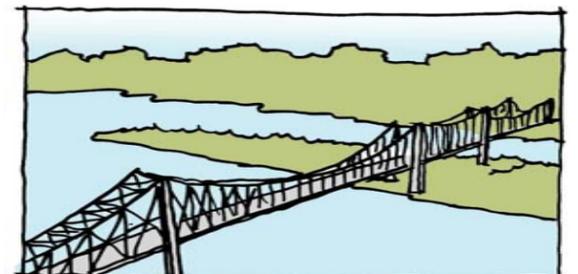
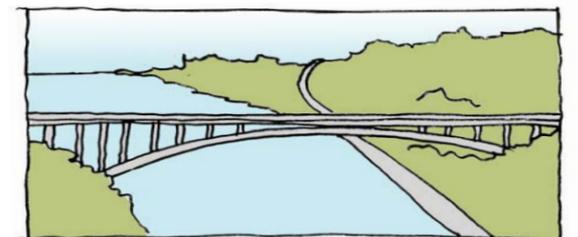
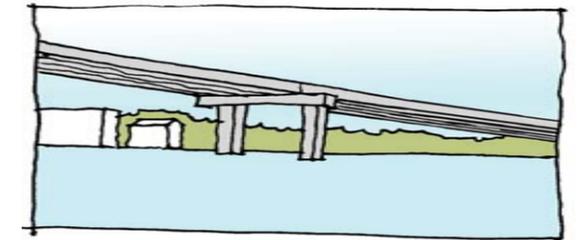
Appropriate span length: 20 – 400 ft.

Applicability for west side project: Suitable bridge type for most conditions.

Structural diagrams



Perspectives



Selecting a bridge type

Major bridge types

Cable Stayed Bridge

Cable stayed refers to a type of bridge where the deck is supported by straight cables attached near the top of towers. The towers are built first and then deck sections and stays are attached progressively.

Appropriate span length: 600 – 1,200 ft.

Applicability for west side project: Long span bridge type is not economical for the varying width of the Portage Bay Bridge.

Extradosed Bridge

The extradosed bridge type is a relatively new form which combines a cable stayed bridge and a box girder bridge. The cable stays and the deck work in combination, allowing the deck to be more slender than a typical box girder bridge and the towers to be shorter than a typical cable stayed bridge.

Appropriate span length: 300 – 900 ft.

Applicability for west side project: Possible bridge type for west end of the Portage Bay Bridge if it can be built in parallel stages.

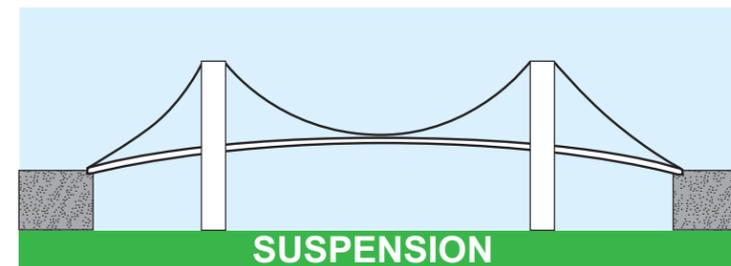
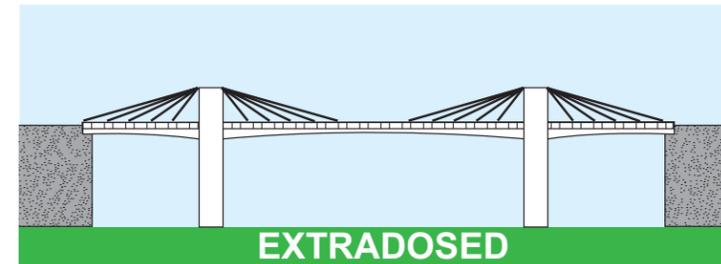
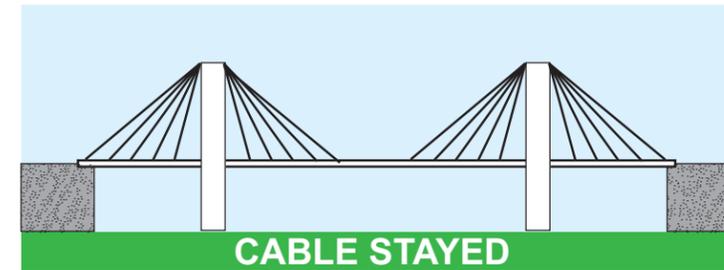
Suspension Bridge

In suspension bridges the roadway hangs from massive steel cables, which are draped over two towers and secured into solid concrete blocks, called anchorages, at both ends of the bridge.

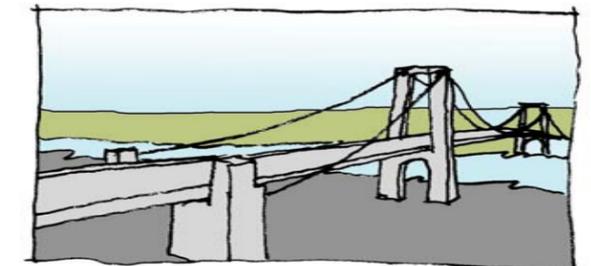
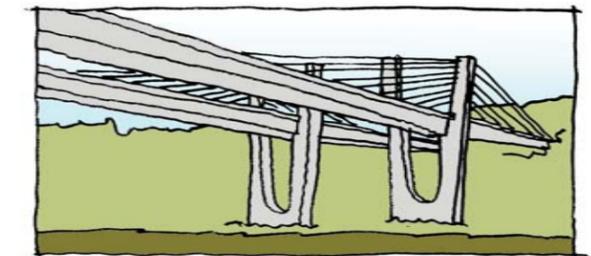
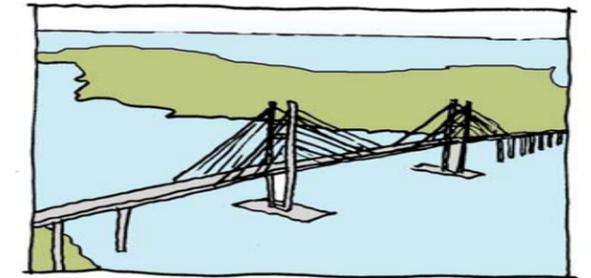
Appropriate span length: 1,500 ft. and up.

Applicability for west side project: Long span bridge type is not economical for the varying width of the Portage Bay Bridge.

Structural diagrams



Perspectives

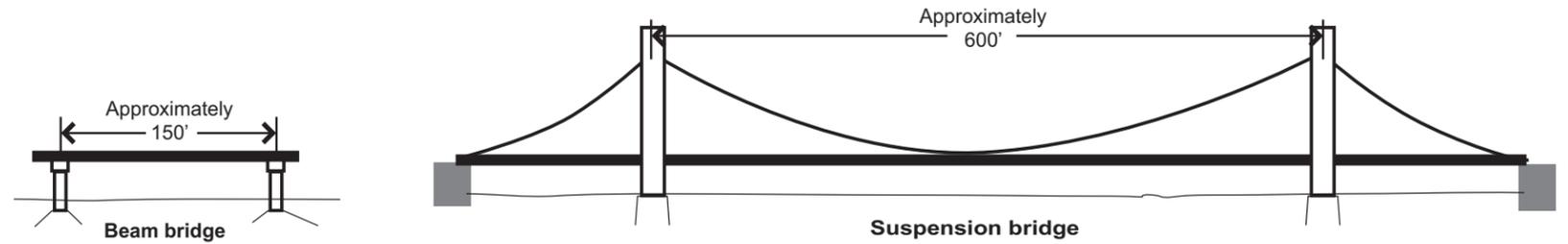


Selecting a bridge type

Basic considerations

Span length

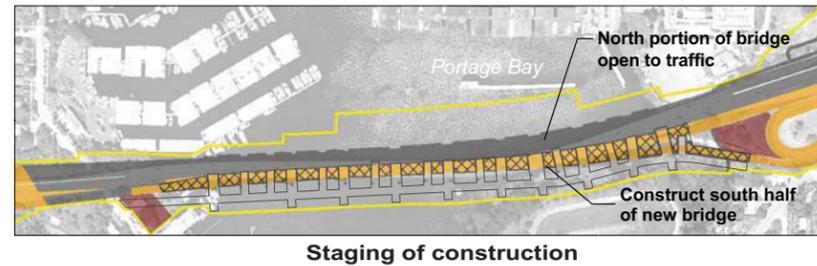
The existing Portage Bay Bridge has span lengths of 100 ft. with 4.5 ft. diameter columns arranged in tight rows. A new bridge would have longer spans and larger but fewer columns. Increased span lengths at the west end could avoid impacts to shoreline neighbors. Less in-water columns would reduce impacts to aquatic life and navigation.



Constructability

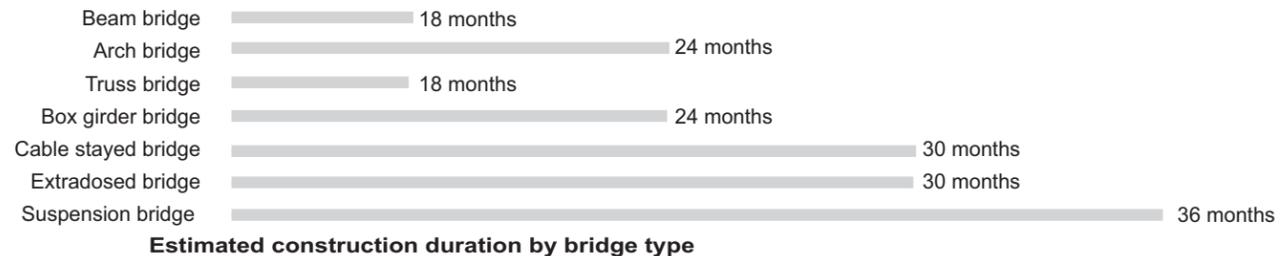
How a bridge is constructed is often constrained by local site conditions. The project is committed to keeping traffic moving in both directions. This requires maintaining or altering the existing bridge and its alignment while building the new bridge. The Portage Bay Bridge would need to be built in two stages and accommodate variable widths.

Soil stability is poor on the North Capitol Hill slope, and into Portage Bay where there is non-structural silty soils to substantial depths. This impacts foundation design, which must be very deep.



Construction duration

Both WSDOT and the surrounding communities want construction to be completed as quickly and as reasonably possible. Different bridge types require varying construction methods and can have different durations. Examples are approximate for a typical 1,500 ft. long bridge.



Architectural character

A new bridge should be an attractive addition to any community, with particular locations having prominence or historical significance. The SR 520 corridor will be a mix of various bridge types that balance opportunities and cost. The west end of the Portage Bay Bridge rising to Roanoke and North Capitol Hill has high visibility from the north bank of the University of Washington and the nearby waterways and residential communities.



Bridge detailing



Under bridge experience



Arching forms



Public access on and under

Community impacts

All of the factors listed above must be balanced against any impacts to the community including impacts on property, air quality, and noise. The Final Environmental Impact Statement documented the impacts of the preferred alternative.

Any time a bridge is built these considerations are weighed against each other to come up with the best solution for the particular context. The West Approach Bridge and the Portage Bay Bridge will course through prominent waterways and parklands, residential communities, and near a few commercial uses. It's role and location are important to Seattle's transportation network and regional identity. Given that context, there are several bridge types that will be considered for our new bridges.