Earthquake Ready Burnside Bridge: Draft Environmental Impact Statement

Executive Summary

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Multnomah County

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Summary

This is a summary of the Earthquake Ready Burnside Bridge (EQRB) Draft Environmental Impact Statement (EIS). An EIS is a disclosure document required by the National Environmental Policy Act (NEPA) for projects that could significantly impact human or natural environments. An EIS describes the process through which a project was developed, analyzes the environmental effects of a proposed action including alternatives, and demonstrates compliance with other applicable laws and requirements. In addition to disclosure, it is meant as a tool to assist in decision-making. An EIS is required for any federal action that is expected to have significant environmental impacts or if there is significant public controversy.

For the EQRB Project, the Draft EIS includes a recommendation of a preferred alternative. Following the public comment period on the Draft EIS, a Final EIS will be prepared that will respond to comments on the Draft EIS and will update information as needed. A Record of Decision (ROD) by the Federal Highway Administration (FHWA), either accompanying or following the Final EIS, will document a formal decision on which alternative to build, present the basis for the decision, specify the "environmentally preferable alternative," and identify the adopted means to avoid, minimize, and compensate for environmental impacts.

? S.1 What is being proposed and why?

Why are we considering creating an earthquake ready bridge in downtown Portland?

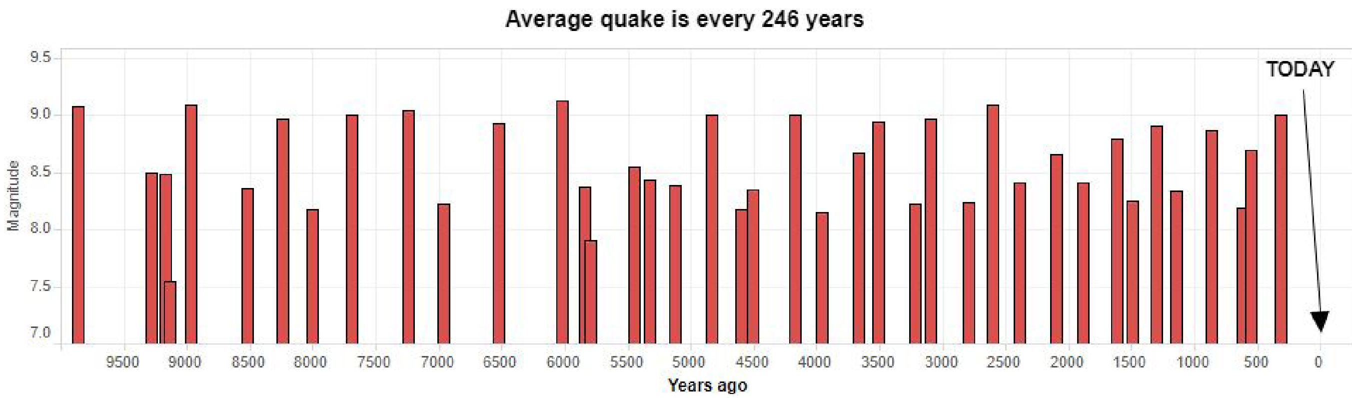
The primary purpose of the EQRB Project is to create a seismically resilient Burnside Street lifeline[1] crossing of the Willamette River that would remain fully operational and accessible for emergency responders, cars, trucks, buses, bikes and pedestrians immediately following the next Cascadia Subduction Zone (CSZ) earthquake. None of the old bridges in downtown Portland were designed to withstand this type of seismic event. A seismically resilient Burnside Bridge would support the region's ability to provide rapid and reliable emergency response, rescue, and evacuation after a major CSZ earthquake, as well as enable post-earthquake economic and community recovery. In addition to ensuring that the crossing is seismically resilient, the purpose is also to provide a long-term, low-maintenance safe crossing for all users for the next 100 years.

What is the earthquake risk?

Oregon is located in the CSZ making it subject to some of the world's most powerful, recurring earthquakes. Geologic evidence shows that more than 40 such earthquakes have originated along the CSZ fault over the last 10,000 years. The last CSZ earthquake occurred 320 years ago, a timespan that exceeds 75 percent of the intervals between these major earthquakes (see Figure S-1). The Oregon Resilience Plan predicts extensive casualties, infrastructure damage, and economic losses from the next CSZ earthquake (OSSPAC 2013).

[1] A lifeline route is a road that allows emergency services to respond after a major earthquake or other disaster, allows evacuation, and allows for transport of food, water, medical supplies and other necessities.

Figure S-1. Frequency and Magnitude of CSZ Earthquakes



Note: Earthquake magnitude (strength) numbers are approximate and based on the Richter scale.

Source: Oregon Live n.d.

We also know that the impacts of the next CSZ earthquake can be reduced through preparation, including creating seismically resilient transportation "lifeline routes," particularly to provide access to critical facilities in urban areas. Such lifeline routes will facilitate emergency response, rescue, and evacuation, as well as enable post-disaster economic and community recovery, and help prevent permanent population loss and long-term economic decline (OSSPAC 2013). The importance of having a seismically resilient lifeline route across the Willamette River is why Multnomah County has proposed to make the Burnside Bridge earthquake ready.

Why is the Burnside Street crossing the best location?

Burnside Street extends 17 miles from Washington County to Gresham with very few overpasses that are vulnerable to collapse. By comparison, I-84, which runs relatively parallel to Burnside Street for the first three miles east of the river, is crossed in this section by 18 overpasses that were not built to current earthquake standards. In addition, unlike nearly all of the other downtown bridges, the Burnside Bridge approaches are not crossed by any I-5 or other highway overpasses that would collapse and block bridge access after a major earthquake.

The intrinsic resiliency of Burnside Street (not including the existing bridge) is a key reason that a regional task force consisting of Metro, counties, cities, and the Red Cross designated the Burnside Corridor as a "Primary EastWest Emergency Transportation Route" (Task Force 1996), a designation later reflected in regional plans (ODOT 2014).

The Burnside Bridge provides a key link in the Burnside Street lifeline route connecting two sides of our region across the Willamette River. however, at 94 years old, the bridge is an aging structure requiring increasingly more frequent and significant repairs and maintenance.

Given its design and condition, the current Burnside Bridge would collapse in the next CSZ earthquake. In fact, none of the aging bridges crossing the Willamette River would be usable after such an event.[2]

The Multnomah County Willamette River Bridges Capital Improvement Plan (2015–2034) (Multnomah County 2015) prioritized creating a Burnside Street river crossing that can withstand a major earthquake. That led to the feasibility study (Multnomah County 2018) that confirmed that Burnside was the best location for creating an earthquake ready bridge in downtown Portland that would meet the proposed action's purpose and need.

[2] Sources: Multnomah County Willamette River Bridges Capital Improvement Plan 2015; EQRB Geotechnical Report 2020; OSSPAC 2013; Oregon DOT Highways Seismic Plus Report 2014

Figure S-2. Project Area

What is the project setting?

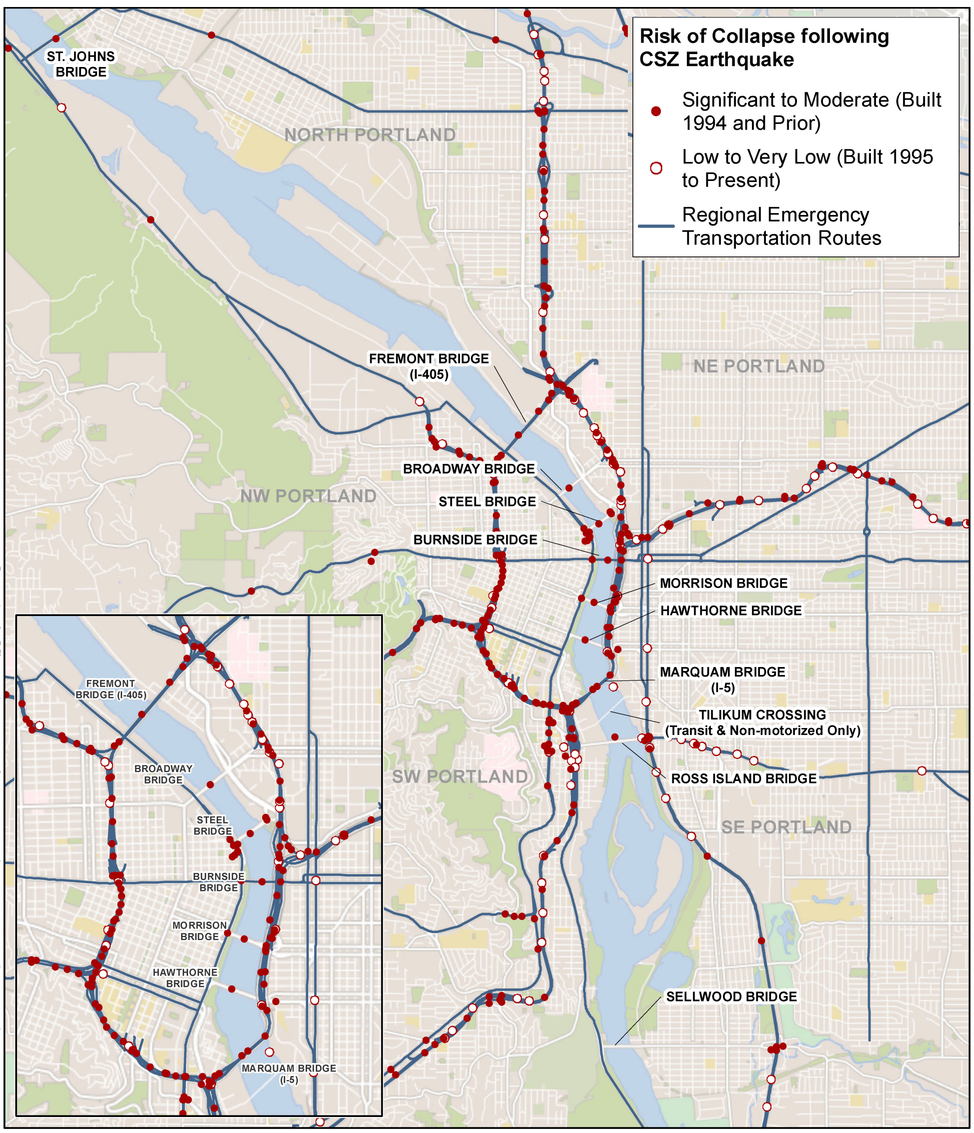
The Burnside Bridge, which crosses the Willamette River, is located in the center of Portland, Oregon (see Figure S-2). Burnside Street is Portland's northsouth street address baseline, and the Willamette River is the eastwest baseline. The bridge provides daily connection across the Willamette River for about 35,000 vehicle trips and over 3,000 pedestrian and bicycle trips per day. The current Burnside Bridge was built in 1926, replacing the original 1892 bridge. The current bridge supports four lanes of general traffic, one transit-only lane, bicycle lanes, and sidewalks, and provides onstreet parking at the far western approach.

What needs is the Project addressing?

Need for a Seismically Resilient River Crossing and Lifeline Route

As noted above, all of the older bridges crossing the Willamette River are expected to suffer seismic damage in a major earthquake. None of the downtown bridges, including the newer ones, are expected to be usable immediately following the earthquake (see Figure S-3). Some of the older bridges are expected to collapse; those that don't collapse are expected to suffer moderate to extensive damage. Many of the bridges, including the Tilikum Crossing which is designed to not fail in the next CSZ earthquake, will nevertheless be unusable because the east approach is not seismically resilient due to liquefiable soils, and because the west approach will be blocked by the collapse of major highway viaducts and ramps located above it. The new Sellwood Bridge is also designed to not fail but is far from downtown and may be inaccessible from downtown due to landslide-prone slopes along Macadam Avenue.

Figure S-3. Potential for Bridge and Road Structure Collapse/Failure



Bridge Collapse Potential

Earthquake Ready Burnside

Need for Post-Earthquake Emergency Response

In their current condition, none of the designated lifeline routes or evacuation routes across the Willamette River will be available for emergency response, rescue, or evacuation immediately following, or possibly for months after, the earthquake. Figure S-4 is a simulation of how a major CSZ earthquake would impact the existing Burnside Bridge[3]. Although not simulated in this graphic, the I-5 and I-84 ramps on the east side and the Harbor Wall on the west side would also be anticipated to fail.

Figure S-4. Simulation of Existing Burnside Bridge after CSZ Earthquake

[3] This simulation was prepared by the Project Team based on the best available information on the likely magnitude, duration and behavior of the next CSZ earthquake, as well as analysis of how the CSZ event would be likely to affect different elements of the existing bridge. The full video simulation can be found at: https://www.youtube.com/watch?v=sn98JkN5HXc&feature=emb_title

Need for Post-Earthquake Recovery

Building resilient infrastructure is less costly to a community than losing access to and attempting to rebuild infrastructure following a disaster (Chang 2000). Transportation infrastructure damaged by an earthquake impairs a region's long-term ability to recover economically and socially after a disaster, adversely affecting a region's population and economy for many years after a major earthquake (OSSPAC 2013; Madhusudan and Ganapathy 2011).

Need for Emergency Transportation Routes and Seismic Resiliency as Stated in Plan and Policy Directives

Local plans and policies that designate Burnside Street as a lifeline and primary evacuation route help describe the need for this Project. In addition, statewide policy describes the need through recommendations for creating seismically resilient transportation routes such as this proposed project. Relevant plans and policies include:

- Regional Emergency Transportation Routes (Metro Task Force 1996)
- City of Portland Evacuation Plan (Portland BEM 2017)
- Oregon Resilience Plan (OSSPAC 2013)

Need for Long-Term Multimodal Travel Across the River

In addition to its function as a lifeline route, Burnside Street serves as an important long-term multimodal (multiple modes of travel such as pedestrians, bicyclists, cars, trucks, and transit) connection between the east and west sides of the Willamette River in downtown Portland and between Gresham and Washington County. The existing Burnside Bridge carries approximately 35,000 vehicles and over 3,000 bicyclists and pedestrians per day. The bridge currently carries three bus routes and is planned to carry a streetcar line. Any changes to the existing crossing should serve not only the postearthquake lifeline need but should also address the continued long-term need for a safe multimodal crossing.

See Chapter 1 of this Draft EIS for the full discussion of the project's Purpose and Need.

S.2 What are the possible solutions to meet the project purpose?

How were the alternatives being studied in the Draft EIS identified?

The process to identify and screen alternatives began in 2016 with the EQRB Feasibility Study. The EQRB project team worked with community and agency stakeholders to develop project objectives and a problem statement, build project awareness through early engagement, and analyze more than 100 options for creating an earthquake ready Willamette River crossing. The options covered a wide range of potential solutions including (see Figure S-5):

- Preservation alternatives (update the bridge but not to full seismic resiliency, and supplement with a lower investment seismic solution such as trams, ferries and other technologies)
- Seismic retrofit alternatives (retrofit the existing bridge to full seismic resiliency)
- Replacement alternatives (replace the existing bridge with a new bridge or tunnel)
- Enhanced seismic retrofit alternatives (partial retrofit and partial replacement of existing bridge)
- Enhance/replace a different bridge (make a different crossing earthquake ready).

Screening criteria were developed and applied (see the EQRB Alternatives Screening Technical Memorandum) with the Project's Stakeholder Representative Group, and the results were shared with other project committees (the Senior Agency Staff Group and the Policy Group) as well as with the public through online events and in-person open houses. Following public input, the feasibility study was completed in November 2018 and the Multnomah County Board of Commissioners adopted the draft Project Purpose and Need and the range of alternatives for further study.

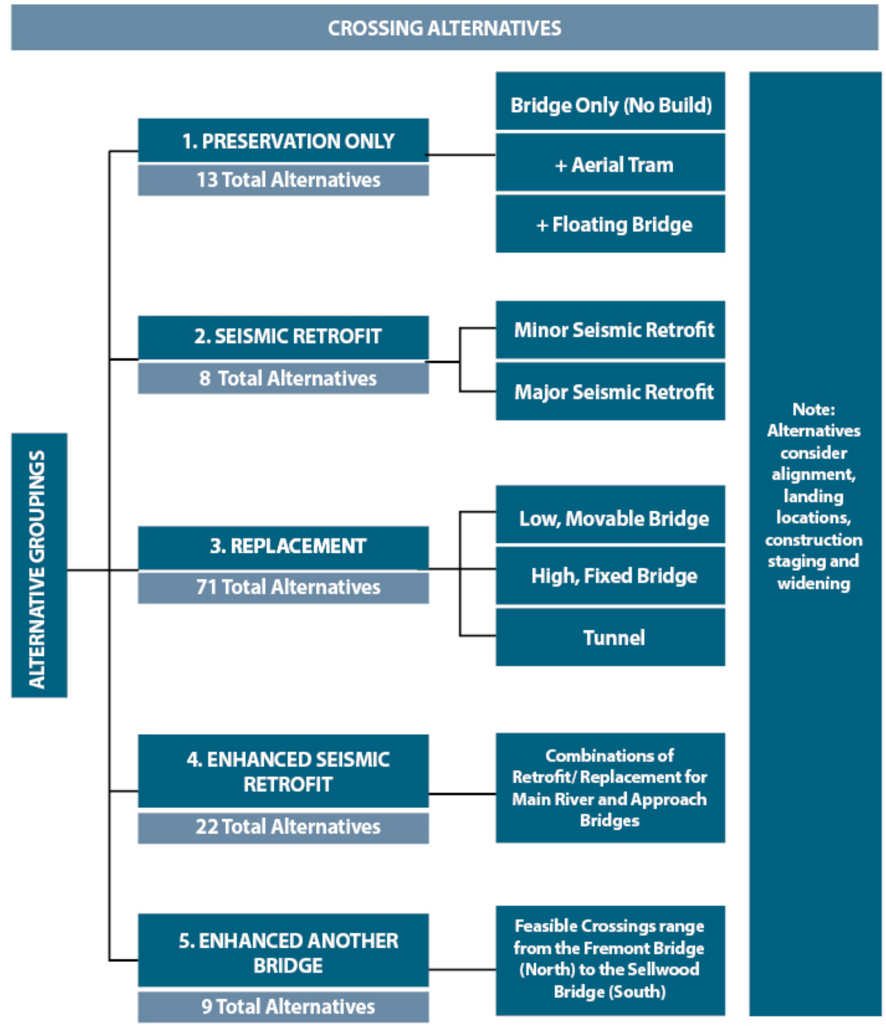
Informal Scoping and Screening

Following the feasibility study, the project team conducted additional analysis and gathered stakeholder input to further evaluate, test and refine the recommended alternatives prior to initiating an EIS. This analysis and input led to further revisions to the range of alternatives:

- The High Fixed Bridge was dropped from further consideration because of added impacts and costs, and because it could not reasonably meet the US Coast Guard (USCG) vertical clearance requirements.
- Further geotechnical analysis clarified a heightened risk of seismic damage to bridge piers [4] located within deep, liquefiable soils located near both the east and west banks of the river. This led to the development of a "long-span" alternative that would minimize the number of piers within those zones and reduce overall construction costs.
- Agency and stakeholder input influenced the development and location of pedestrian, bicycle and Americans with Disabilities Act (ADA)-accessible connections at both the east and west ends of the bridge.
- Input from social services providers influenced revisions to the west bridge abutment so that the replacement alternatives could avoid blocking essential access doors to the Portland Rescue Mission during construction.
- Users of the Burnside Skatepark requested that the Project preserve the skatepark. In addition, historic preservation specialists recommended that the skatepark could be eligible for listing on the National Register of Historic Places. Through refined design and construction approaches, three of the four build alternatives studied in the EIS would preserve the skatepark.

As a result of this additional analysis and input, the alternatives were refined, and four were advanced to the Draft EIS.

Figure S-5. Range of Potential Crossing Types Evaluated in the Feasibility Study



[4] Pier (aka, bent) – An intermediate vertical support under a bridge, made up of one or more columns connected at their top-most ends by a cap, strut, or other member. A pier is sometimes differentiated from a bent by the number of columns (one vs. more than one, respectively).

Alternatives Carried Forward to the Draft EIS

The following summarizes the alternatives and options studied in detail in the Draft EIS, including the No-Build Alternative, the four Build Alternatives and the four options for managing cross-river traffic during construction. More detail can be found in Chapter 2 of this Draft EIS or in the *EQRB Bridge Replacement Technical Report* (Multnomah County 2021e).

No-Build Alternative

As required by the NEPA, the EIS evaluates a No-Build Alternative and compares its impacts to the proposed Build Alternatives. The No-Build analysis describes the impacts and outcomes if the proposed action is not implemented. The No-Build Alternative assumes that all other programmed and planned projects would move forward, but that the Burnside Bridge would not be made earthquake ready.

Build Alternatives – Common Elements of Operations and Design

The four build alternatives are:

- The Enhanced Seismic Retrofit Alternative that would partially retrofit the existing bridge, as well as replace major components required to meet seismic design criteria.
- Three different replacement alternatives that would remove the existing bridge structure and build a new bridge at the same location. These include the Replacement Alternative with Short-span Approach, the Replacement Alternative with Long-span Approach, and the Replacement Alternative with Couch Extension.

Under normal operations, all build alternatives would provide access across the bridge for the same transportation modes that presently use the bridge. They are also being designed to accommodate potential future streetcar service. All build alternatives would also accommodate all river navigation and surface transportation modes (Union Pacific Railroad tracks, I-5, local streets, the MAX light rail transit line, and bicycle and pedestrian paths) that presently pass under the bridge.

All build alternatives would remain fully operational and accessible for all modes of transportation following a CSZ earthquake of up to a 9.0 magnitude on the Richter scale, providing a reliable crossing for emergency response, evacuation, and economic recovery.

The replacement alternatives would be designed and constructed to provide at least 2 feet of clearance between the bridge and adjacent buildings to allow independent movement during a seismic event.

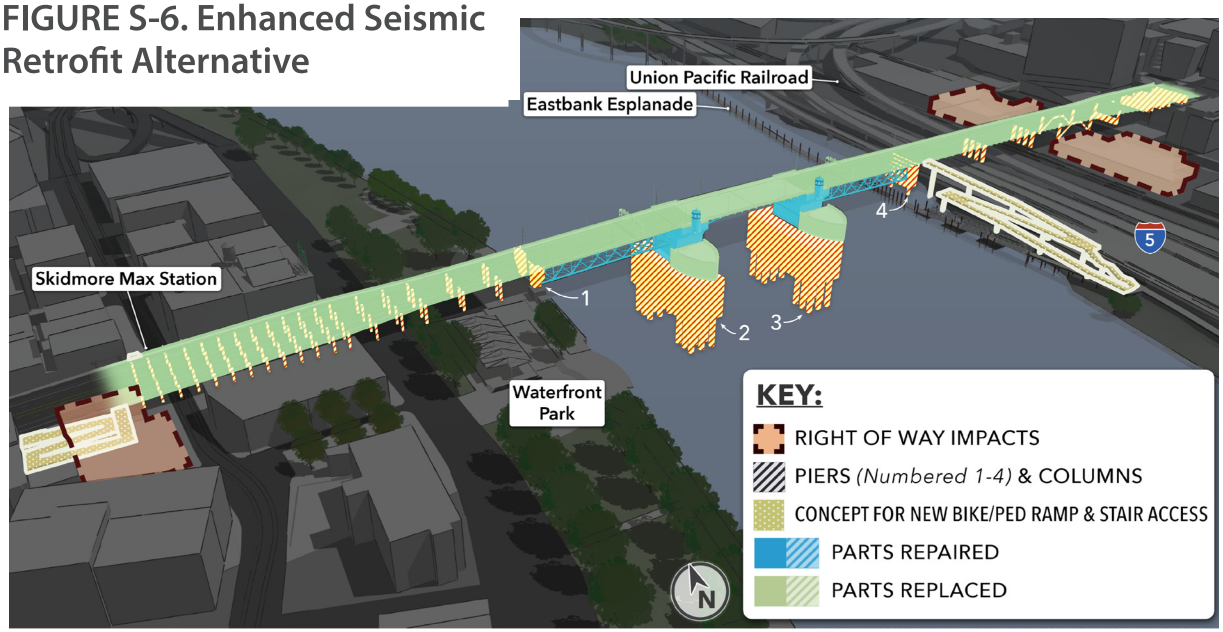
Presently, buildings and elevated highway infrastructure are very close (in some cases, with only a one-inch gap) to the bridge, making it likely that they would knock into each other during a major seismic event and increase the damage to both.

Enhanced Seismic Retrofit Alternative

With this alternative, some parts of the bridge would be retrofitted and some would be replaced. Figure S-6 is an aerial view of the Retrofit Alternative and Figure S-7 shows which elements would be retrofitted or replaced. See Table S-1 for a comparison of the major bridge elements for all of the build alternatives.

Under this alternative, the bridge width would be the same as existing, which narrows over the water. Cross sections showing bus, vehicle and pedestrian and bike lanes for different sections of each alternative are shown in Figure S-8.

FIGURE S-6. Enhanced Seismic Retrofit Alternative



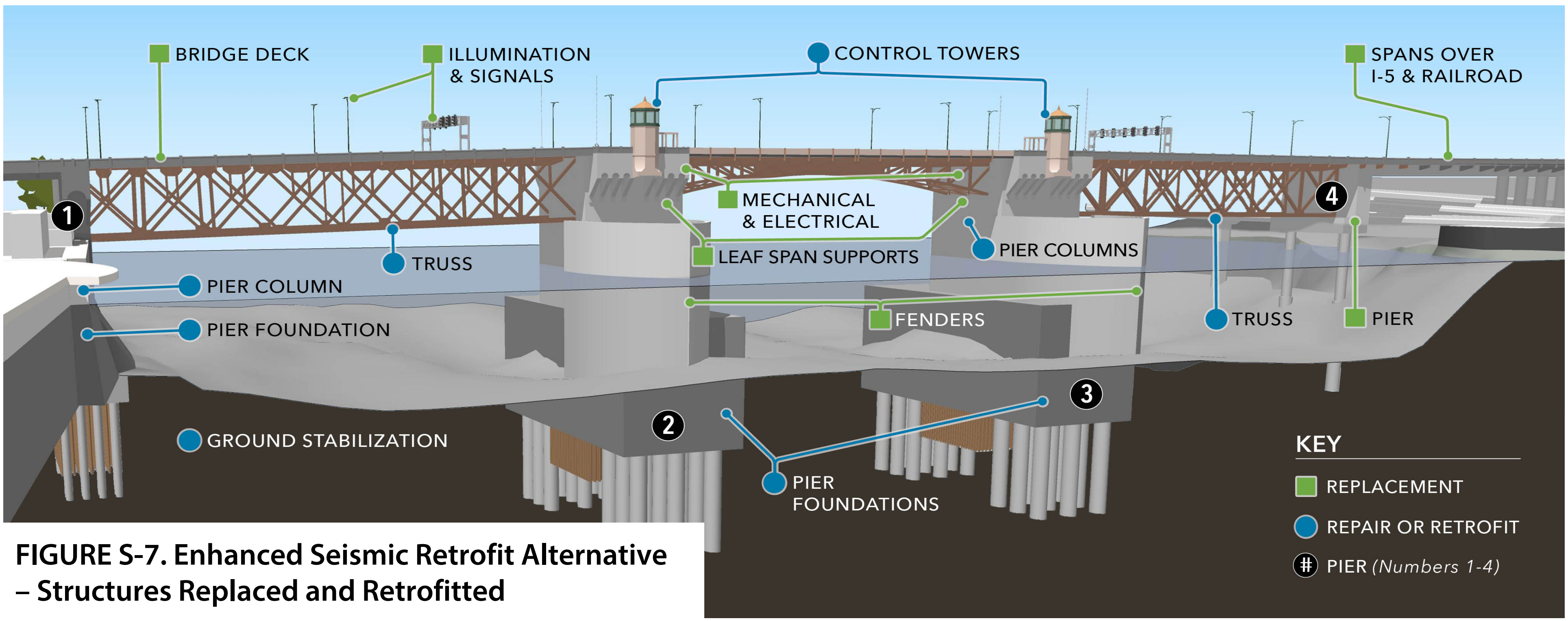


FIGURE S-7. Enhanced Seismic Retrofit Alternative – Structures Replaced and Retrofitted

FIGURE S-8. Lane Configurations

Replacement Alternatives

The three replacement alternatives under consideration would remove and replace the existing Burnside Bridge. Like the existing bridge, they are comprised of three separate segments: the west approach spans, the east approach spans, and a movable center span system that would be constructed over the primary navigation channel. The replacement alternatives would widen the portion across the water to provide more space for bicycles, pedestrians, and safety buffers (Figure S-8). The movable section of the replacement alternatives could be either a movable bascule[5] span (similar to the existing bridge) or a vertical lift span. See Table S-1 for a comparison of the major bridge elements.

Table S-1. Major Bridge Elements by Alternative

Element	Retrofit Alternative	Short-Span Alternative	Long-Span Alternative	Couch Extension
Piers and bents	Encase existing Piers 2 and 3 in concrete; Add multiple deep reinforced concrete foundation columns to Piers 1-4. Seismic upgrade of all 34 existing on-land support bents and E and W bridge abutments. 7 bents located in GHZ.	Replace all piers on deep foundations; Bent on both approaches supported by columns on drilled shafts. Stabilize soils surrounding 5 bents located in the GHZ on both approaches to protect against lateral spreading during a seismic event.	Same as Short-span. Stabilize soils surrounding 1 bent located in GHZ in east approach.	Same as Short-span. Stabilize soils surrounding 8 bents located in GHZ in both approaches.
West approach	13 bents west of Naito Pkwy and 5 in Waterfront Park.	4 bents west of Naito Pkwy and 2 in Waterfront Park.	4 bents west of Naito Pkwy and 1 in Waterfront Park.	4 bents west of Naito Pkwy and 2 in Waterfront Park.
East approach	15 bents on land and 1 in river.	4 bents on land and 1 in river.	2 bents on land and 0 in river.	10 bents on land and 2 in river.
Movable bridge span	Retrofit or replace existing bascule span leaf.	Could be a bascule span or vertical lift bridge.	Same as Short-span.	Same as Short-span.

E = east; GHZ = geologic hazard zone (see Section S.3 and Figure S-14); W = west.

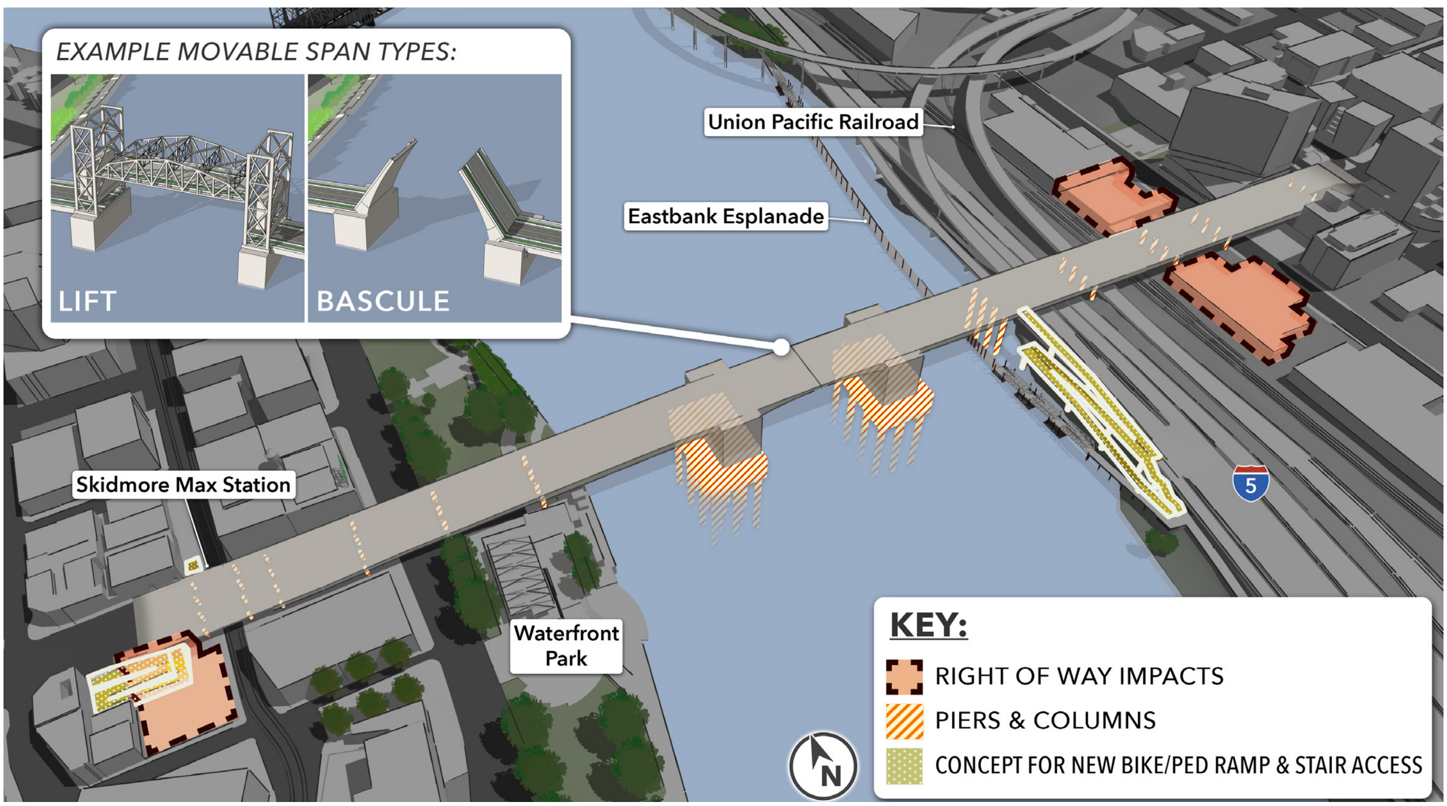
[5] Bascule – A bridge with one or two leaves which rotate from a horizontal to a near-vertical position, providing unlimited vertical clearance above.

Replacement Alternative with Short-Span Approach

The Short-span Alternative would completely replace the existing structure but would be very similar in alignment. As with the existing bridge, the structural members of the approach spans would be below the bridge deck, and it would have the same connection to W Burnside and only slightly modified connections to NE Couch Street and E Burnside on the east end. The east and west approaches of the Short-span Alternative would each be composed of six spans (fewer than the existing bridge) connecting to a central movable span and would eliminate the need for the existing support bent (Pier 1) along the Harbor Wall. On the east approach, it would place one additional bent in the river east of the Esplanade to maintain an obstruction-free navigation channel. Figure S-9 shows an aerial view of the proposed layout including the proposed locations of bents and span sections, as well as bascule and vertical lift options for the movable span.

This alternative would provide more space for bicycle and pedestrian infrastructure on the bridge, especially in the midspan of the bridge, than the Retrofit Alternative (Figure S-8). Connection points for bicycles and pedestrians at either end of the bridge would be the same as shown for the Retrofit Alternative in (Figure S7).

FIGURE S-9. Replacement Alternative Short-Span Approach



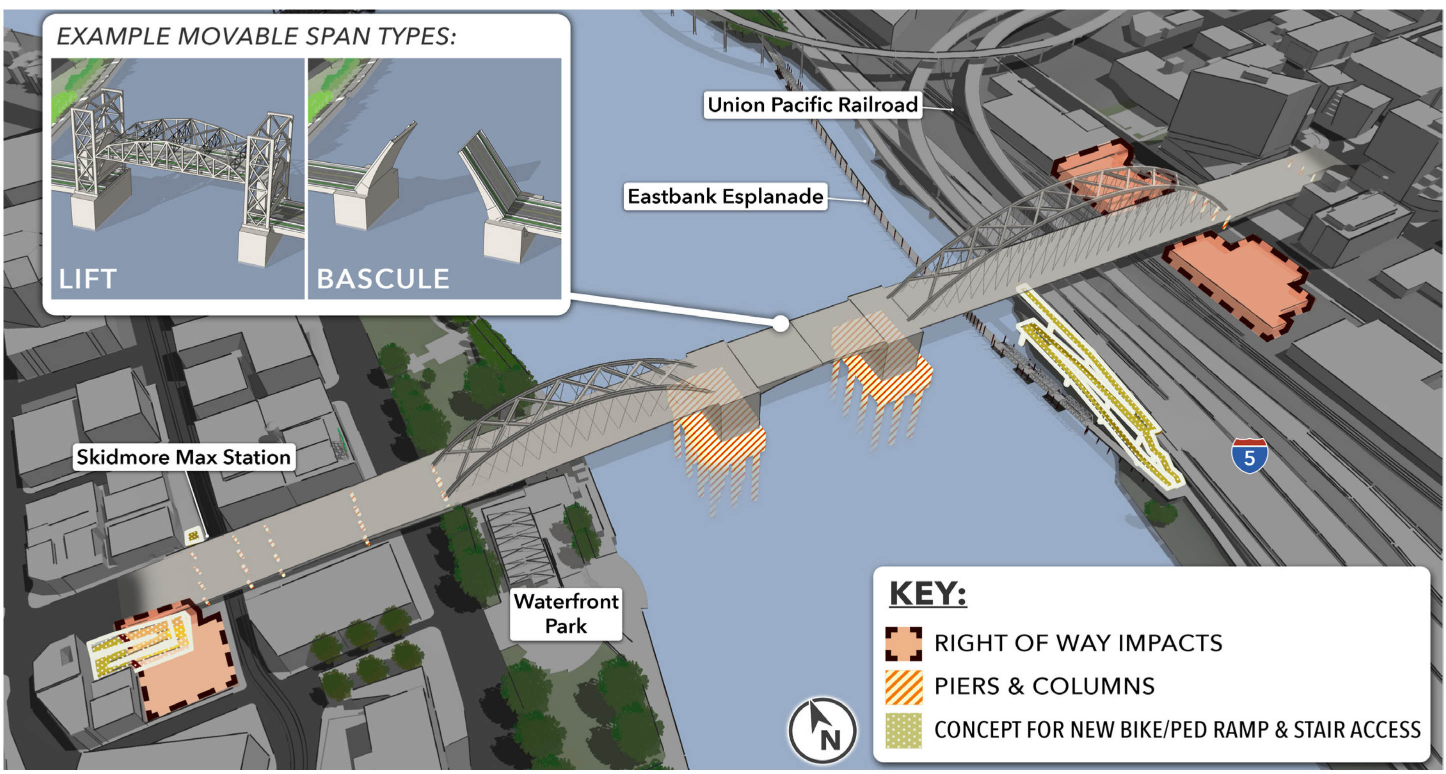
Replacement Alternative with Long-Span Approach

Except where identified on the next page, the Long-span Alternative would be the same as the Short-span Alternative.

Bridge alignment and connections would be very similar to the Short-span Alternative. The primary differences would be that the Long-span Alternative approaches would be supported by above-deck superstructure that would reduce the need for piers, bents, deep foundation, and soil improvement work. Common long-span bridge types include tied-arch, cablestayed and through-truss bridges, such as the nearby Fremont, Tilikum, and Steel or Hawthorne bridges, respectively. For the east approach, the height of the superstructure above the bridge deck could range from about 140 feet for a tied-arch bridge to about 250 feet or more for a cable-stayed bridge. (see Figure S-16 for example of potential bridge types).

On the west side, the Long-span Alternative would include a clear span extending from the east side of Naito Parkway eastward approximately 450 feet to one of only two in-water piers at the west end of the center movable span (thus eliminating the columns in Waterfront Park and on the Harbor Wall). On the east side, the bridge would extend from the movable span in the river to just west of SE 2nd Avenue, approximately 740 feet (eliminating a pier from the river and two sets of piers west of SE 2nd Avenue). Table S-1 compares the major bridge elements of the alternatives.
Figure S-10 shows an aerial view of the Long-span Alternative with the proposed location of bents and bridge span sections assuming the superstructure would be a tied-arch span. It also shows examples of the two potential movable-span options: bascule and vertical lift.

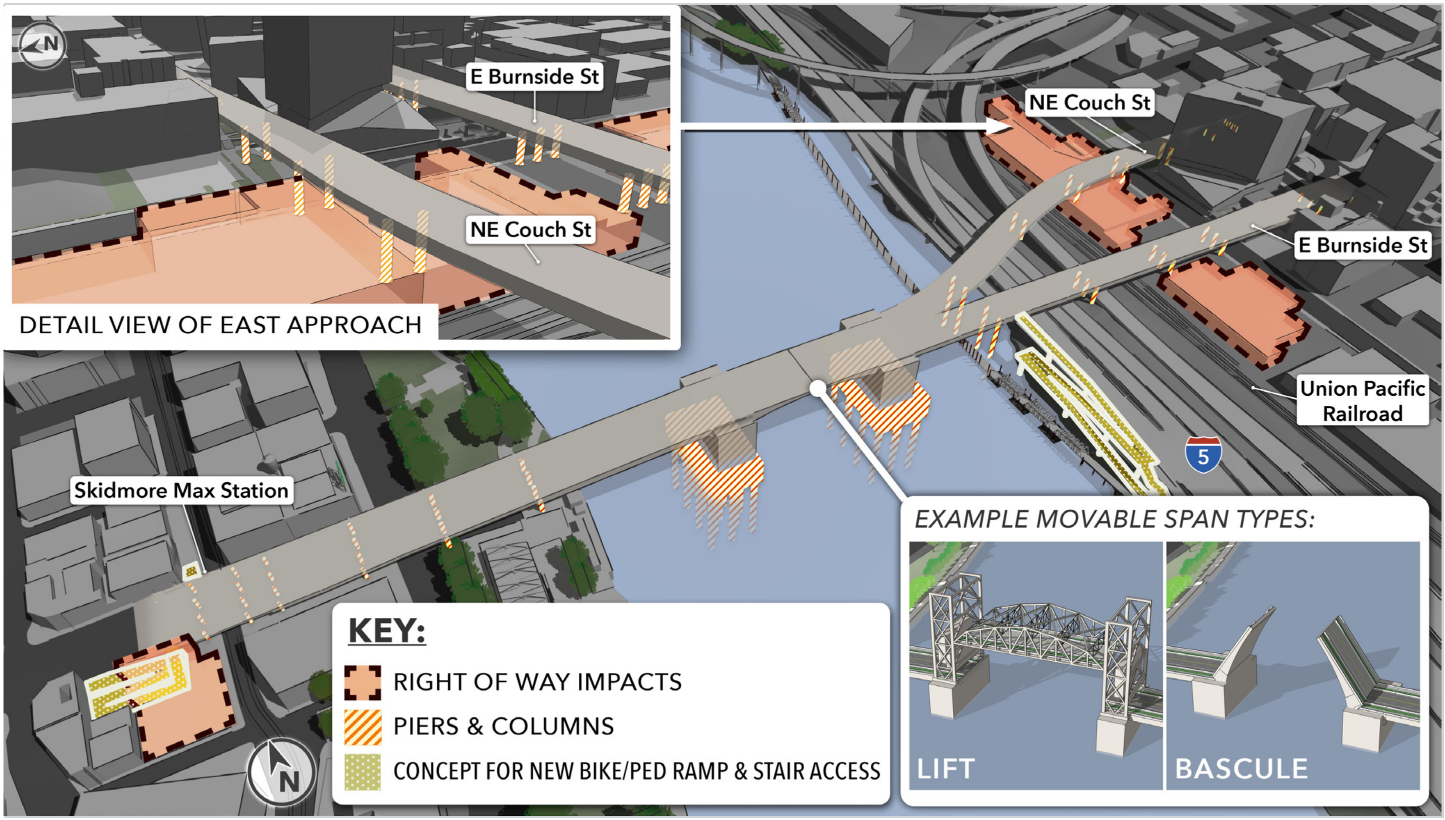
FIGURE S-10. Replacement Alternative with Long-Span Approach



Replacement Alternative with Couch Extension

The Couch Extension Alternative (Figure S-11) has the same west approach and movable-span sections as the Short-span Alternative but would provide a different configuration for the east approach. The east approach span would extend the Burnside/Couch couplet approximately 1,100 feet farther west on a viaduct over SE 3rd and 2nd Avenues, the Union Pacific Railroad tracks, the freeway ramps, I-5 and the river, thus resulting in a bridge that splits just east of the movable span.

FIGURE S-11. Replacement Alternative with Couch Extension



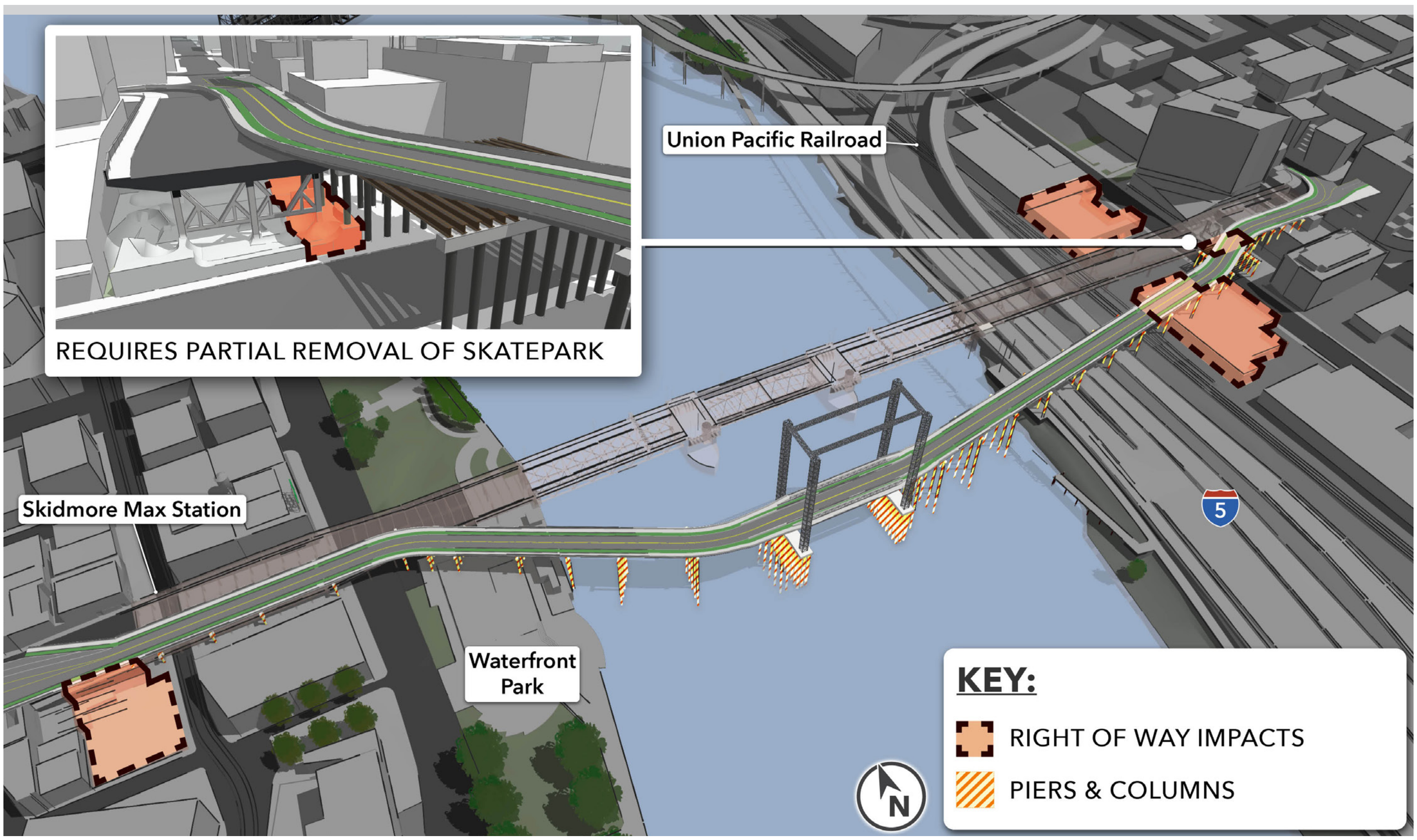
Temporary Bridge Options

A temporary bridge could be constructed to allow some level of vehicular, pedestrian, and bicycle traffic to cross the Willamette River at Burnside while the main bridge is closed during construction. A temporary detour bridge would help reduce the impacts on cross-river travel but it would not accommodate all of the bridge's current vehicle travel demands.

The EIS is considering three different modal options for a temporary bridge: (1) two general traffic lanes (one in each direction) allowing all motor vehicles, as well as bike lanes, and sidewalks; (2) two busonly lanes, bike lanes, and sidewalks; or (3) bicycles and pedestrians only.

If selected, a temporary bridge would be constructed to the south of the permanent bridge and tie into the permanent east and west approach spans. The temporary bridge would include a movable lift section over the active navigation channel to accommodate river traffic up to 147 feet above the Ordinary High Water Mark of the Willamette River as required by the US Coast Gaurd. See Figure S-12.

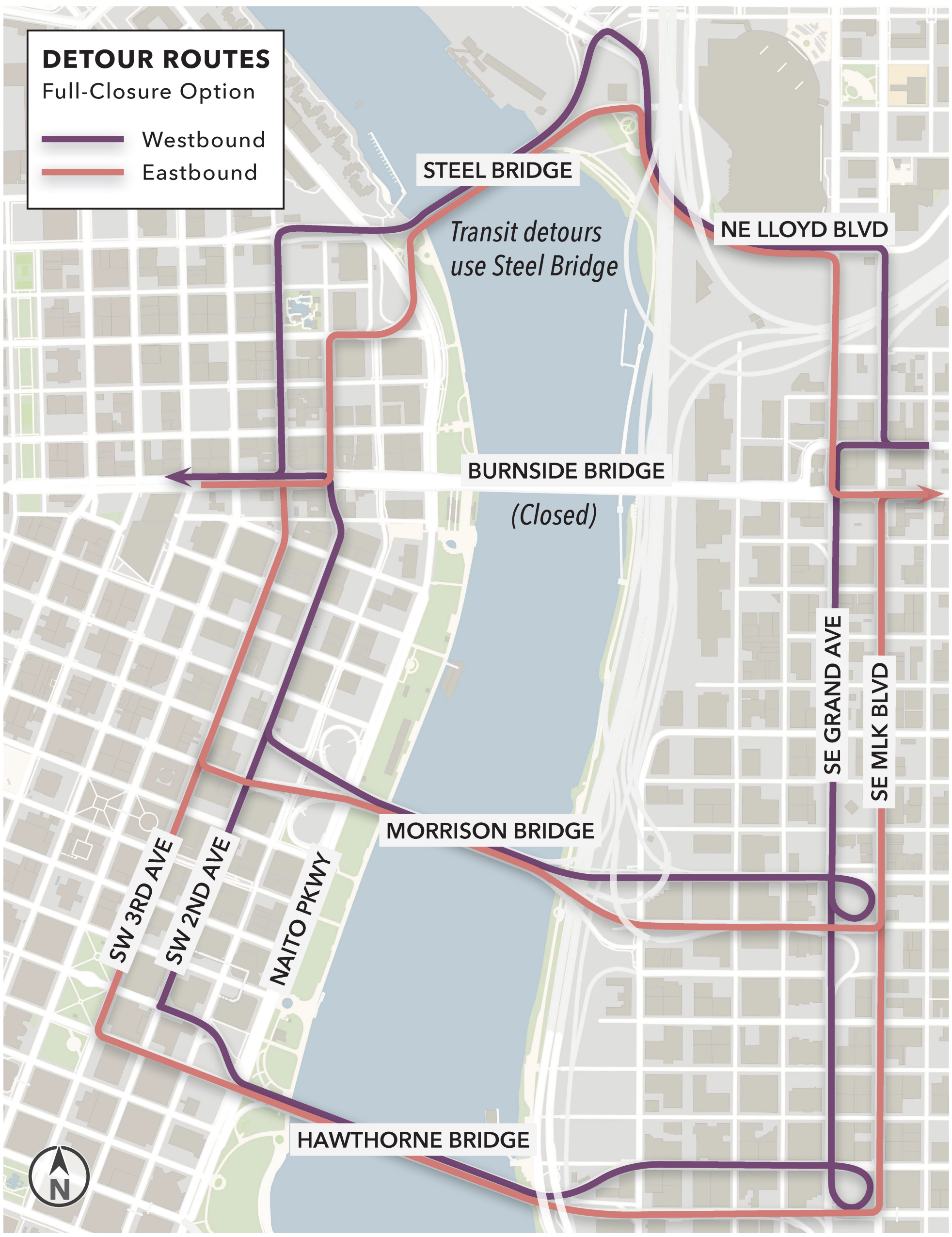
FIGURE S-12. Example of Temporary Bridge for Short-Span Alternative



No Temporary Bridge (Full Closure during Construction)

Because of the high cost and impacts associated with a temporary bridge, the Project is also considering detouring all trips to other existing bridges during construction. With this option, the Burnside crossing would be fully closed to all modes for about 2 years with the Retrofit Alternative and 4 years with the replacement alternatives. Traffic management would include rerouting buses, autos, bicycles, and pedestrians to adjacent river crossings, as well as potentially implementing travel demand and transportation system management to reduce trips and encourage more transit, pedestrian, and bicycle use. Buses would likely detour across the adjacent Steel Bridge. Vehicle, bicycle and pedestrian traffic would detour over both the Steel Bridge and the Morrison Bridge. See Figure S-13.

FIGURE S-13. Full Closure of Bridge During Construction



Cost Estimates and Project Funding

The current cost estimates range from $800 to $1,095 million for the range of build alternatives being considered in the Draft EIS. Building a temporary bridge for motor vehicles and/or bicyclists and pedestrians would add approximately $60 to $90 million on top of these estimates. Based on current estimates, the Preferred Alternative (Long-span) is the lowest-cost alternative and the Couch Extension is the highest-cost. Given the current conceptual level of design, these preliminary cost estimates are expressed as a "probable range," which means that there is an estimated 80 percent probability that the final costs will be within the low and high end of the range for each alternative. The cost range for each alternative (see Draft EIS Attachment O, Cost Risk Assessment Summary Sheets) reflects the range of potential bridge types and an assessment of risks with each bridge alternative. As the project design advances, the cost range will narrow. The final cost will be influenced by design details, bridge type selection, risk mitigation, market conditions at the time of construction, and using the Construction Manager/General Contractor contracting method to identify cost-saving opportunities.

Most of the existing bridge structural elements have been in service for close to 100 years. Retrofitting only some parts of the bridge would mean that elements not retrofitted would be in service for approximately 200 years. Because of this, more maintenance would be required for the Retrofit Alternative than for any of the replacement alternatives. Long-term maintenance costs would be lowest with the replacement alternatives.

The Project has already secured funding for the Design phase which will begin after the Final EIS and ROD. Following the Draft EIS comment period, Metro will begin a process to adopt the Preferred Alternative into the financially constrained Regional Transportation Plan.

S.3 What would be the consequences of the different alternatives?

No-Build Alternative Consequences

The primary factor differentiating the No-Build Alternative from the build alternatives is that the No-Build Alternative would not meet the purpose and need of the Project. It would leave downtown Portland with no usable Willamette River crossing after the next CSZ earthquake. Currently, there are 45 traffic and transit lanes that cross the river in downtown. With the No-Build Alternative, all 45 lanes would be severed, significantly hampering emergency response, evacuation, reunification and long-term community and economic recovery. The No-Build would forego the build alternatives' bicycle, pedestrian and safety improvements as well as the ancillary improvements including improved stormwater quality, park and recreation access, improved security, and removal of contaminated soils and sediment. On the other hand, it would avoid the immediate adverse impacts associated with constructing the build alternatives, including the impact of removing the historic bridge. However, at 94 years old, the existing bridge will need to be replaced or significantly retrofitted at some point in the future.

Build Alternatives' Consequences

All of the build alternatives would meet the basic purpose and need for the Project, although the Long-span Alternative would provide a greater level of seismic resiliency (due to fewer piers in the geological hazard zone), and all of the replacement alternatives would better serve the future needs of pedestrians and bicyclists. The following compares and contrasts the benefits and impacts of the build alternatives.

Traffic, Freight and Transit:

The main long-term impacts would be small safety improvements, especially with the replacement alternatives, and the ability to run streetcar service across the bridge. Short-term impacts would differ primarily in that the Retrofit Alternative would have the shortest temporary closure duration of 2 years compared to 4 years with the replacement alternatives. Construction would also require temporary closures of the MAX station under the west end of the bridge ranging from a total of 8 weeks for the Retrofit Alternative to a total of 14 weeks for the replacement alternatives; TriMet would use buses to shuttle passengers around the closed portion of MAX track.

Bicyclists and Pedestrians:

All build alternatives, especially the replacement alternatives, would provide safer pedestrian and bicycle facilities across the bridge and connections to the broader network; the replacement alternatives would also provide wider and more protected bicycle lanes and sidewalks. All build alternatives also propose to add a new bicycle and pedestrian ramp at the west end of the bridge and another near the east end that would connect to the Eastbank Esplanade. The Couch Extension would eliminate an existing, one block long bike/pedestrian path/connection between NE Martin Luther King, Jr. Boulevard and SE 3rd and replace it with a much longer on-street bike lane route. Construction of all alternatives would add a temporary, minimally out-of-direction (longer) reroute of the Waterfront Pathway for 3.5 to 4.5 years. During construction, the Eastbank Esplanade would be closed for between 18 and 30 months; the Long-span Alternative would have the shortest closure and the Couch Extension would have the longest; this would cause out-of-direction travel and potential avoidance of trips.

Land Use, Economics and Displacements:

Property acquisitions and business displacements that would be required to build the bridges would be the main adverse impact. The main long-term difference among build alternatives would be that the Couch Extension would have two additional permanent property acquisitions. With no change in traffic capacity, none of the alternatives would be expected to have indirect effects on land use patterns or regional economics, except post-earthquake. During construction, all of the build alternatives would temporarily displace Portland Saturday Market operations from under the west end of the Burnside Bridge, but the replacement alternatives would displace the market for about one year longer than the Retrofit Alternative.

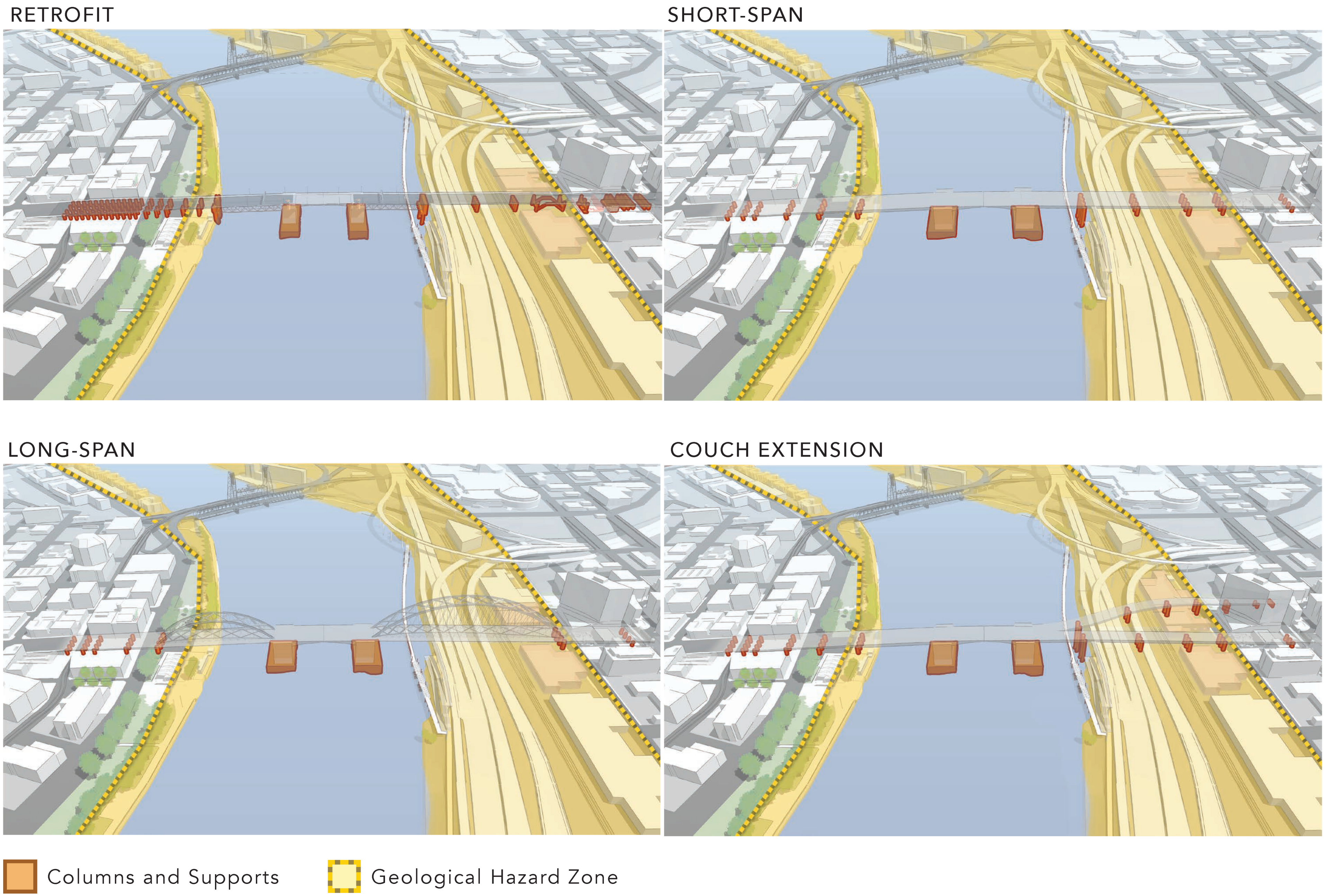
Water Quality:

All of the build alternatives would treat more stormwater runoff (from the new bridge and from some areas around the bridge) than is treated under existing conditions. In-water construction with all build alternatives is likely to have temporary adverse impacts to water quality that could affect fish. The differences among build alternatives would be relatively minor.

Geology and Soils:

While temporary erosion could occur during construction, the largest geologic impact from the build alternatives would be the beneficial creation of an earthquake ready bridge that would mitigate the seismic impacts on the Burnside crossing. The Long-span Alternative is unique among the alternatives in that it would largely avoid placing bridge supports in the geologic hazard zones on the east and west banks of the river (see Figure S-14), as noted in the discussion of Seismic Resiliency for the Preferred Alternative.

FIGURE S-14. Build Alternatives' Bridge Supports Located in Geological Hazard Zones



Hydraulics:

In order to be seismically resilient, the build alternatives would have larger piers than existing. The increased fill in the river is likely to cause a small rise in future peak flood levels that may be unavoidable. Hydraulic modeling will be conducted as part of the bridge type study during the Final EIS phase to more precisely calculate the impact and evaluate potential mitigation. Changes in the piers could change scour[6] impacts as well. The Long-span Alternative would place the least net new fill in the river (Table S-2). In-water construction activities such as cofferdams[7] and temporary piles would temporarily increase peak flood levels and scour with all build alternatives.

Table S-2. Structure Below Ordinary High Water

	Permanent		Temporary		
Alternative	Area of Structure (acres)	Number of Shafts	Area of Piles (square feet)	Number of Piles	Cofferdam Area (acres)
Retrofit	1.4	57	500-700	160-220	1.1
Short-span	0.8–1.2	37–45	Same	Same	1.2-1.5
Long-span	0.8–1.1	33–41	Same	Same	0.8-1.1
Couch Extension	0.8–1.2	38–46	Same	Same	1.3-1.6

Note, permanent impacts show a range that reflects the two different bridge types for the movable span. The low end is if the bridge includes a vertical lift span; the high end is if the bridge includes a bascule span that requires larger piers.

Vegetation and Wildlife:

The primary long-term impact would be the loss of habitat where permanent piers would be located in the river. Permanent improvements in stormwater treatment would benefit aquatic organisms. During construction, pile driving causes hydroacoustic impacts that can harm fish and so would need to be conducted during regulatory in-water work windows. Other in-water construction activities, such as installing cofferdams or drilling shafts, would temporarily affect water quality and/or displace habitat that could affect aquatic organisms.

[6] Scour is the removal of sediment (such as sand) from the river bed by water flow. Changing water velocity can change scour.

[7] A cofferdam is a temporary enclosure that's built/placed in a river or other water body, extending from below the river bottom to above the water surface. The water inside is pumped out in order to create a dry space for doing work, such as drilling shafts or building bridge piers.

Noise:

Construction of all of the build alternatives would generate noise that could temporarily affect residents living adjacent to the ends of the bridge. Potential mitigation is discussed in Chapter 3 of the Draft EIS. None of the alternatives would increase long-term noise impacts, although the Couch Extension would cause minor changes in the noise impact locations at the east end of the bridge. The main existing and projected future source of traffic noise in the area is I-5 and related ramps, not the Burnside Bridge.

Air Quality:

The build alternatives would have no long-term impacts on air quality but all of them would generate emissions and dust during construction that could affect the comfort and health of residents living adjacent to the west end of the bridge. Impacts are also possible for residents of older buildings on the east end although they are located farther from the immediate construction area. Potential mitigation is discussed in Chapter 3 of the Draft EIS.

Hazardous Materials:

Construction of all of the build alternatives would create the risk for accidental spills or contact with existing contamination. The risk could be largely mitigated through best practices as well as response planning. Construction would also be likely to have a beneficial impact by removing existing contaminated sediments or soils during excavation and in-water work.

Climate Change:

The build alternatives would not directly affect long-term transportation greenhouse gas (GHG) emissions. However, the pedestrian and bicycling improvements, especially with the replacement alternatives, could indirectly lead to more trips being taken by bicycle or walking rather than automobile, which could result in small reductions in future GHG emissions. Construction activities, detours, and construction materials would increase GHG emissions during construction.

Social Services, Environmental Justice and Equity:

During construction, all of the alternatives would generate increased noise, dust and emissions that could disproportionately affect the residents staying in the transitional housing and shelters located adjacent to the western bridgehead and to other homeless individuals in the area. Potential measures to mitigate those impacts are described in Chapter 3 of the Draft EIS. The biggest adverse impact to social service providers and their clients would be from the Retrofit Alternative which would require a 2- to 3-month closure of the Portland Rescue Mission during construction. Over the long-term, the improved pedestrian, bicycle and safety features on the Replacement bridges would be a substantial benefit to environmental justice [8] (EJ) populations. The potential for improved security under the bridge in Waterfront Park and Naito Parkway area (by eliminating columns that create shadows and reduce natural surveillance [9] of public spaces), especially with the Long-span Alternative, would also benefit EJ populations.

Parks and Recreation:

There would be no long-term adverse impacts to public parks but the replacement alternatives, especially the Long-span, would benefit Waterfront Park by removing existing bridge columns. The replacement alternatives would require short-term (4-8 months total) closures of the Burnside Skatepark during construction; the Retrofit Alternative would permanently displace the Burnside Skatepark. All of the alternatives would close part of Waterfront Park during construction for 3.5 (Retrofit) to 4.5 (Replacements) years, and all would require removal of existing trees to allow for bridge construction (trees would be replanted). All alternatives would also temporarily close a portion of the Eastbank Esplanade.

Historic Resources:

There would be no impact to the two historic districts at the west end of the bridge nor the historic district near the east end. There will be a need to monitor construction vibration to ensure that it does not cause physical harm to nearby unreinforced masonry buildings. All of the replacement alternatives would remove the Burnside Bridge, and the Retrofit Alternative would cause substantial changes that would render it no longer eligible for the National Register of Historic Places. The Retrofit Alternative would also remove the Burnside Skatepark which has been recommended as eligible for the National Register; the other alternatives would only require a short-term closure for safety during construction. The Long-span Alternative would alter the view of the historic White Stag sign from some viewpoints but would not physically impact it.

Visual:

Because it would have the least visual change, the Retrofit would have the least potential for both adverse and beneficial visual impacts. The above-deck superstructures of the Long-span, and the potential for a vertical lift movable span with all of the replacement alternatives, have the highest potential to impact (both adversely and beneficially) views and visual experiences. Concerns and opportunities include river views, views from the bridge, compatibility with existing visual features, and potential new or enhanced visual experiences. The Bridge Type Study will explore this in greater depth during the Final EIS phase.

[8] "Natural surveillance" is a principle of design that aims to increase personal safety and security in public spaces. It includes designing physical features so as to maximize visibility and foster positive social interaction.

[9] Environmental justice (EJ) populations, as used in this document, refers to low income and minority populations, as defined by the Executive Order on Environmental Justice.

Differentiators Between Construction Traffic Management Options

The four construction traffic management options are:

- Full Closure (no temporary bridge)
- Temporary Bridge, All Modes
- Temporary Bridge, Transit, Bicycles and Pedestrians Only
- Temporary Bridge, Bicycles and Pedestrians Only.

The key differentiators among these options are impacts to traffic/freight, transit travel times, bicyclists and pedestrians, natural resources, and parks and historic resources, as well as cost and the duration of construction.

Cost, Duration of Construction, and Seismic Resiliency

- The primary benefit of a temporary bridge would be to reduce the intensity of construction-phase impacts on different modes of transportation. The downsides of that benefit are that it would add $60-90 million to the project cost, and would add about 1.5 to 2 years to the total duration of construction thereby extending the duration of all construction-related impacts including noise, air emissions, natural resource impacts, disruption to travel, disruption to businesses and social services, and closures of the affected parks and recreation facilities. It would also cause the region to wait an additional 1.5 to 2 years to secure a seismically resilient crossing.

Traffic/Freight

- The All Modes Temporary Bridge would be able to accommodate about two-thirds of the traffic that crosses the permanent bridge today and would have the least impact on traffic travel times and congestion on other existing bridges. Congestion on other bridges would increase by about 2 to 8 percent. Travel times across the River would increase generally by 5 to 15 percent which is about half the increase with the Full Closure option.
- The other options, including the Full Closure option, would divert all traffic and freight trips to other Willamette River crossings; a very small portion of auto trips might change to transit or active transportation. The detoured traffic would increase peak period congestion on the Morrison and Steel Bridges by 10 to 20 percent and increase peak period travel times by 3 to 10.5 minutes depending on the travel direction and the bridge.

Transit

- Buses would be able to cross on the All Modes Option and the Transit/Bike/Ped Only Temporary Bridge Option, but increased congestion would increase travel times by about 15 to 35 percent compared to existing. The Portland Streetcar (loops A and B) would experience relatively small (less than a minute) travel time delays.
- The Full Closure Option and Bike Pedestrian Only Option would reroute bus Lines 12, 19 and 20 to the Steel Bridge, increasing travel times across the river by about 5 minutes. There would be no impact on MAX ridership. The Portland Streetcar will likely face additional delays along Martin Luther King, Jr. Blvd and Grand Avenue as additional congestion on those streets slows traffic speeds by between 10 and 20 percent.

Active Transportation

- Once operating, any of the temporary bridge options would maintain pedestrian volumes and have only a minor (3 percent) reduction in bicycle volumes using the Burnside crossing. However, building a temporary bridge would add 4 months to the total duration of closure of the Eastbank Esplanade which would have an extended effect (out-of-direction travel and possibly foregone trips) for bicyclists and pedestrians who otherwise use that route.
- For the Full Closure option, all bicycle and pedestrian traffic would need to be detoured to other Willamette River bridges, primarily the Steel Bridge (adding 0.8 miles and 7 minutes travel time for cyclists and about 0.6 miles and 14 minutes for pedestrians) or the Morrison Bridge (adding about 1 mile and 8 minutes travel time for cyclists and about 18 minutes for pedestrians). Metro's Regional Travel Demand Model estimates that not providing a temporary bridge could result in an approximate 2 percent reduction in bicyclists crossing the Willamette River and 19 percent fewer pedestrians compared to providing a temporary bridge.
  The out-of-direction travel would impact the ability of some people to access the social services provided by agencies near the west end of the bridge. Recommended mitigation is to make transit passes available for social service providers to distribute to their clientele who would otherwise not be able to access their services given that walking and cycling trips would be substantially longer via the Morrison or Steel Bridges.

Parks and Historic Resources

- All of the Temporary Bridge Options would add 1.5 to 2 years of closure to the affected areas of Waterfront Park including the Japanese American Historical Plaza, the reroute of the Waterfront Trail, and the closure/relocation of the Portland Saturday Market. The temporary bridge options would add about 4 months to the closure of the Eastbank Esplanade.
- They would also expand the area of closure within Waterfront Park to include the Ankeny Plaza structure and the Bill Naito fountain area (See Figure S-15). In addition, they would require the removal of the mature trees (four) that flank both the east and west sides of this part of the park.
- The temporary bridges would require a temporary demolition of a small portion of the Burnside Skatepark and would close the southern portion of the skatepark for 5 to 6 years as well as extend the full Skatepark closure by about 4 months.

Natural Resources

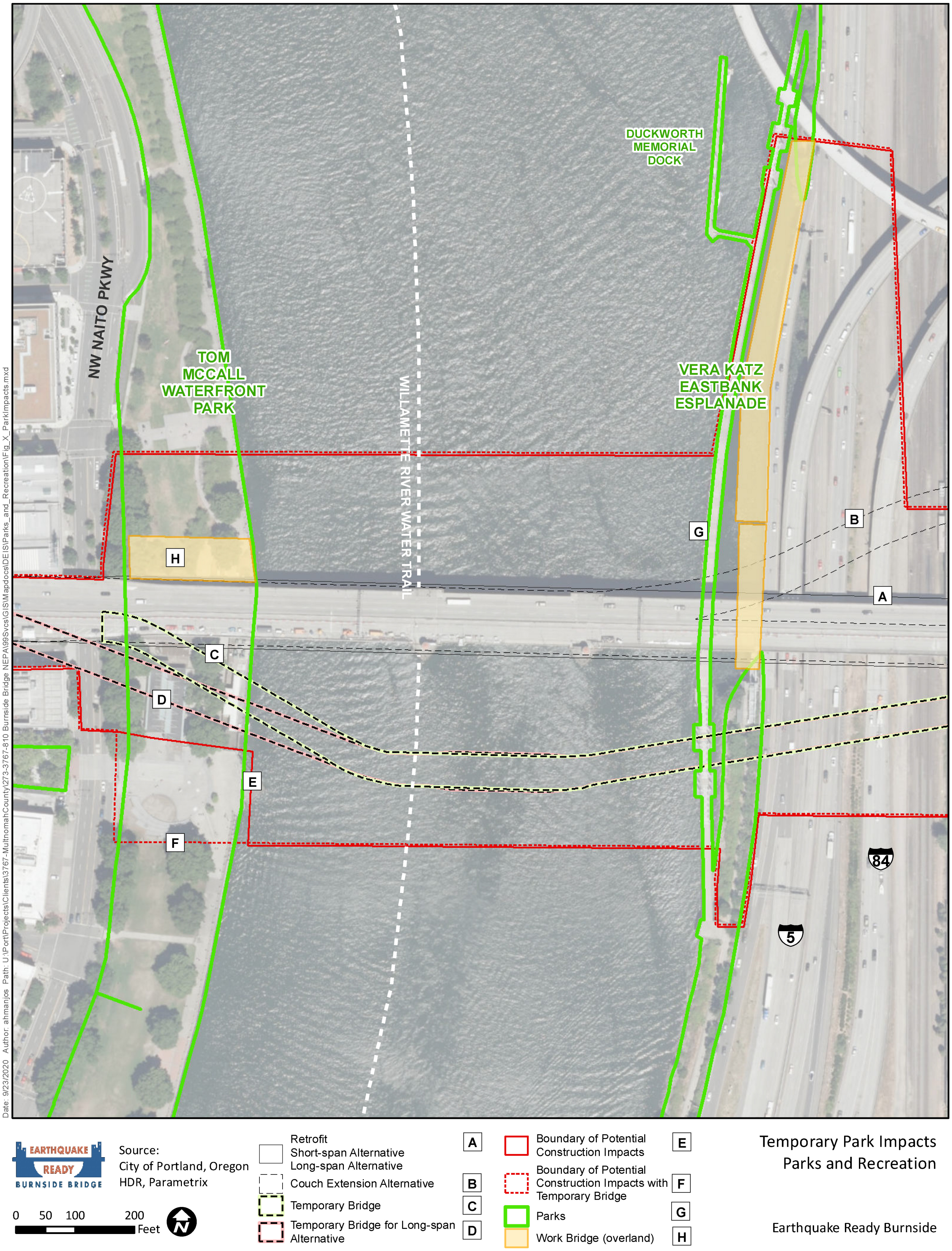
- Building a temporary bridge would increase the number of temporary piles in the river (by 70 to 180, including 10 in shallow water habitat), increase the temporary loss of vegetation/wildlife habitat by about 0.2 acres (see Table S-3), and increase the peak flood elevation for about 5 to 6.5 years. They would also increase the duration of all of the main bridge construction's temporary impacts on water quality and fish by 1.5 to 2 years.

Table S-3. Additional Approximate Temporary Construction Impacts with Use of Temporary Bridge

Bridge Type	Area of Piles below OHWM (square feet)	Piles below OHWM	Area of Piles in SWH (square feet)	Piles within SWH	Lost Vegetation/ Wildlife Habitat (acres)	Trees Removed (Retrofit Alternative)	Trees Removed (Replacement Alternatives)
All Modes	410–570	130–180	32	10	0.4	10	9
Transit, Bicycles, and Pedestrians Only	410–570	130–180	32	10	0.4	10	9
Bicycles and Pedestrians Only	220–290	70–90	32	10	0.4	10	9

Notes: OHWM = ordinary high water mark, SWH = shallow water habitat

FIGURE S-15. Temporary Park Impact Areas



S.4 What is the preferred alternative?

The Preferred Alternative

Following almost 2 years of coordination, analysis and input, in June 2020, the Project's Community Task Force (CTF) recommended that the Long-span Approach Alternative, and the No Temporary Bridge Option, be the Preferred Alternative (PA) (see descriptions of this alternative and option in Section S.2 above).

Their process to reach that recommendation included identifying the community's values, defining evaluation criteria and measures, and reviewing analysis of the alternatives' and options' performance and impacts. They also considered the input from the team's technical experts, from resource agencies and other participating agencies, and from other stakeholders including the public. Their process to reach that recommendation included identifying the community's values, defining evaluation criteria and measures, and reviewing analysis of the alternatives' and options' performance and impacts. They also considered the input from the team's technical experts, from resource agencies and other participating agencies, and from other stakeholders including the public.

In August 2020, the project team solicited input on the CTF's recommendation from multiple stakeholder groups, agencies and the public through online open houses, an online survey and web meetings. This input, which indicated broad support (85 percent) for the PA recommendation, was provided back to the CTF who then reconfirmed their recommendation in Sept 2020. The recommendation was then unanimously endorsed by the voting members of the Project's Policy Group on October 2, 2020. The Multnomah County Board of Commissions adopted a resolution on October 29, 2020 expressing approval for the recommended PA. The Draft EIS will further solicit public input on the PA, and it will be open to potential revision. Following the public comment period on the Draft EIS, there will be continued coordination with participating and permitting agencies, stakeholders and the public, as well as refinement of the design and analysis, before the FHWA endorses the final action through the NEPA ROD that is expected to be issued in October 2021.

The CTF recommendation included consideration of how the alternatives performed on 49 different criteria covering 13 different topics including:

- **Seismic resiliency**
- **Community quality of life**
- **Equity and environmental justice**
- **Crime reduction and personal safety**
- **Business and economics**
- **Parks and recreation resources**
- **Historic resources**
- **Visual and aesthetics**
- **Natural resources, climate change and sustainability**
- **Pedestrians, bicyclists and people with disabilities**
- **Motor vehicles, freight and emergency vehicles**
- **Transit**
- **Fiscal responsibility**

A description of the evaluation criteria and measures, as well as scoring results can be found in the Draft EIS Attachment H. The Long-span Alternative scored 25 and 20 percent higher than the Retrofit Alternative and the Couch Extension Alternative, respectively and just a little higher (about 4 percent) than the Shortspan Alternative. In addition to the scoring, the CTF considered other factors in making their recommendation.

The primary advantages of the Long-span Alternative are:

- **Seismic Resiliency:** All the build alternatives would be seismically resilient but the Long-span Alternative would carry the least risk. It would place the fewest piers in the geologically hazardous zones particularly on the east side. A large earthquake is expected to liquefy the entire eastern slope which would cause lateral spread (essentially a land/mudslide) that would exert massive lateral forces on any piers on that slope. The other alternatives would include significant jet grouting to stabilize the slope, but the Long-span Alternative would largely avoid this risk by installing a very long approach span that would eliminate piers in the geological hazard zone on the west side of the river and require only one pier near the upper portion of the geological hazard zone on the east side.
- **Parks and Recreation:** With the fewest columns under the bridge, the Long-span Alternative would open up space in Waterfront Park, create views to the river from the park space under the bridge, and improve personal security in the public spaces under the bridge. It would also protect the Burnside Skatepark that would be removed by the Retrofit Alternative and would have the shortest duration closure of the Eastbank Esplanade during construction.
- **Social Services and Equity:** Like the other replacement alternatives, it would maintain the operations of the Portland Rescue Mission during construction (which would be temporarily displaced by the Retrofit Alternative) and would provide the greatest improvements to bicycle and pedestrian capacity, comfort and safety on the bridge.
- **Natural Resources:** The Long-span Alternative has the smallest permanent footprint in the river including avoiding placing any piers in shallow water habitat.
- **Cost:** The Long-span Alternative is currently the lowest-cost alternative.

The No Temporary Bridge (Full Closure) option scored higher than any of the temporary bridge options but only slightly higher than the All Modes Option. While the Full Closure would cause more congestion and outofdirection travel during construction, it has substantial advantages in other regards.

The primary advantages of the Full Closure option are:

- **Lower cost:** It would save about $60-90 million in construction costs.
- **Seismic resilience:** By shaving 1.5 to 2 years off the construction duration, the region would secure a seismically resilient crossing that much sooner.
- **Shorter duration construction impacts:** The duration of all construction-related impacts including noise, air emissions, disruption to travel, disruption to businesses and social services, and disruption to navigation, would be shortened by about 1.5 to 2 years. The temporary bridge impacts to barge transport would also be avoided.
- **Lower resource impacts:** It would avoid the added physical impacts of a temporary bridge to Waterfront Park and the Burnside Skatepark, have less impact on in-water habitat and flooding, preserve four mature trees that flank the river and the park, and have a shorter duration closure of the Eastbank Esplanade, Waterfront Park, and the Waterfront Trail

More information on the PA evaluation and recommendation can be found in the Preferred Alternative Technical Memo (Attachment H of the Draft EIS).

S.5 What are the unresolved issues?

Preferred Alternative

As described above, the recommended PA is the Long-span Alternative with no temporary bridge. While this combination has received broad agency and public support, the decision will not be final until the ROD is signed by FHWA at the end of the NEPA process. The public and agencies provided input on the recommendation in the summer of 2020, and will be invited to again provide input on the PA recommendation during the Draft EIS comment period.

Bridge Type

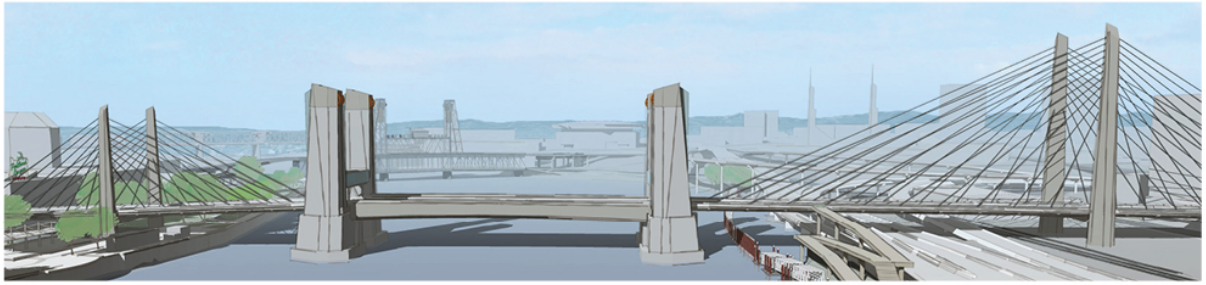
The PA defines many important elements of the proposed bridge but does not recommend the "bridge type" which refers to the specific structural design for the spans. Some elements of the PA, such as general span lengths and approximate pier locations and sizes, narrow the range of possible bridge types, but the recommendation on specific bridge type requires additional analysis and consideration that is being done through the Bridge Type Study. The Type Study began in October 2020 and will be concluded in spring 2021 at which point there will be a bridge type recommendation. Typically, a bridge type determination study occurs later in the NEPA process or even after the NEPA process. However, the 2017 Executive Order 13807,[10] and subsequent guidelines, which are referred to as One Federal Decision, requires that federal permits be issued within 90 days of the NEPA ROD. To meet that timeline, a bridge type recommendation is needed earlier in the EIS process than usual so that the project can develop the information required for those federal permit applications well in advance of the ROD. If the PA were to change at some point after the Draft EIS, it is understood that it could change the potential bridge types and thus require revisiting the bridge type analysis and recommendations.

Because the Long-span Alternative is the recommended PA, bridge types that cannot be reasonably built to clear span the long distances of this alternative's approach spans are not being studied. Several bridge types that will be considered include cable-stayed, tied-arch and through-truss bridges and potentially others. For the movable span over the navigation channel, the bridge type could be either a bascule bridge or a vertical lift bridge (see Figure S-16).

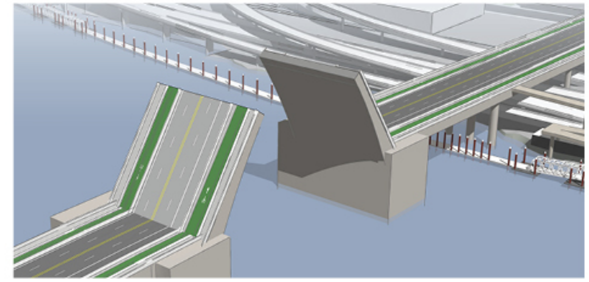
Because multiple bridge types are possible, the Draft EIS and the environmental technical reports are based on the highest impact that could occur with the possible types, and in some cases the documents note how impacts could differ with the different bridge types. The Bridge Type Study will further evaluate variations in impacts to help inform the bridge type recommendation. During the Type Study, the project team will solicit public input, including on the evaluation criteria that will be used, and the impacts, benefits and tradeoffs of the various options. The first opportunity for public input will be in early 2021, and then again in spring 2021 before a final decision is made on bridge type. Public input will be provided to the project team and the CTF who will have the primary role in developing criteria and making a bridge type recommendation. Any relevant new information developed through the Type Study process would be referenced in or incorporated into the Final EIS.

[10] More information on One Federal Decision and Executive Order 13807 can be found at: https://www.environment.fhwa.dot.gov/nepa/oneFederal_decision.aspx

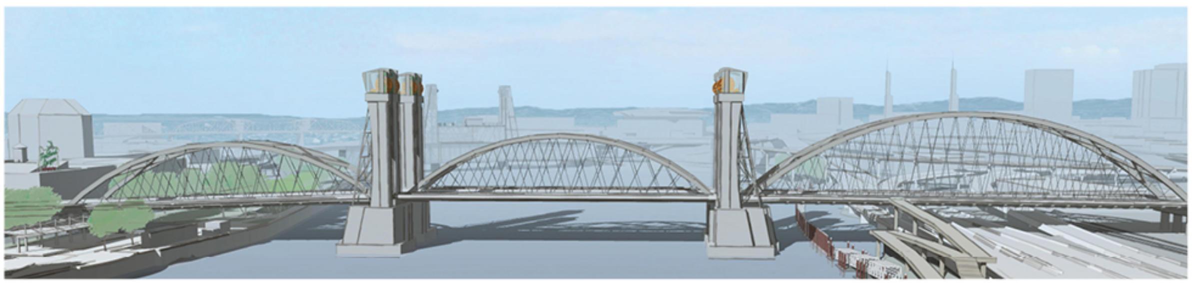
FIGURE S-16. Examples of Potential Long-Span Approach Bridge Types and Movable Span Bridge Types



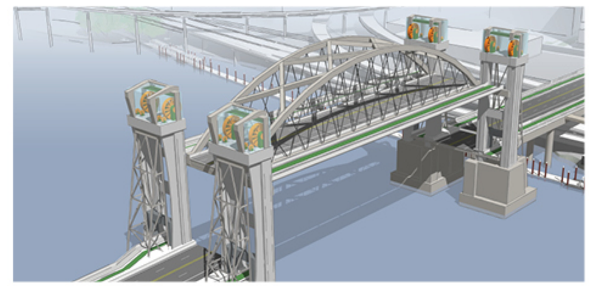
Replacement Long Span – Cable Stayed Concept



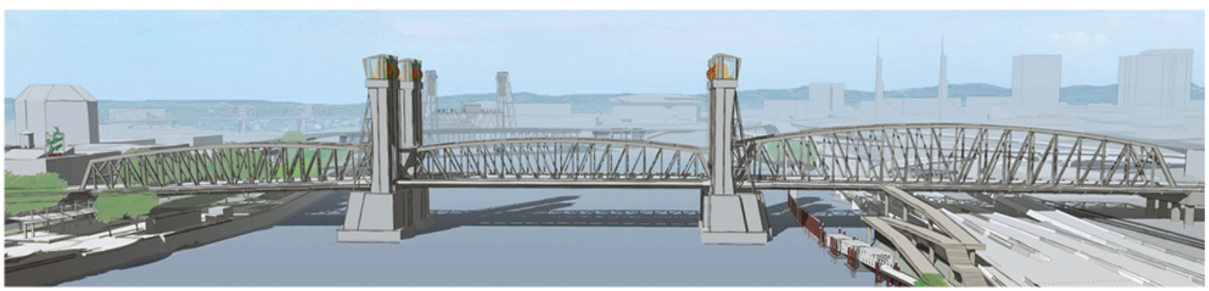
Movable Span Option – Bascule



Replacement Long Span – Tied Arch Concept



Movable Span Option – Vertical Lift



Replacement Long Span – Through Truss Concept

Active Transportation Connections to the Bridge

Currently, a stairway connects the southern (eastbound) sidewalk on the Burnside Bridge to the Eastbank Esplanade approximately 50 vertical feet below it. The stairway is primarily for pedestrians because it is not ADA-accessible and requires bicyclists to carry their bikes up or down the stairs. There is no existing connection between the Esplanade and the bridge's northern (westbound) sidewalk and bike lane. There is ADA and bicycle access to the bridge approximately 1,000 feet east of these stairs at the eastern end of the bridge, but there is no direct ADA or convenient bicycle access between the bridge and the Esplanade.

The original project description proposed to either (a) replace the existing southside stairs with new stairs and an elevator, or (b) replace the existing southside stairs with a ramp. Either option would provide direct pedestrian, ADA, and bicycle access between the Esplanade and the bridge's eastbound sidewalks and bike lanes. These two options are included in the technical reports.

After completion of the technical reports, some stakeholders requested that the Project add direct bicycle, ADA, and pedestrian access to the north side of the bridge. The County initiated a process with the City of Portland and gathered other stakeholder input to develop and evaluate a broad range of potential options for improving or creating new access between the Esplanade and both sides of the bridge. At the time of Draft EIS publication, numerous options have been proposed and are under consideration. Any of the access options could be paired with any of the bridge alternatives and bridge types. Therefore, the PA decision and the bridge type decisions are independent of any decision on the Esplanade access options.

While many options are on the table, they can be grouped into four basic types for purposes of analyzing basic performance and impacts:

1. Stairs and elevator on north and south sides of the bridge
2. Stairs and elevator on south side of the bridge only, with a signalized mid-block crossing on the bridge connecting the north and south sidewalks and bike lanes
3. Ramp on north side of the bridge and ramp and stairs on south sides of the bridge
4. Ramp and stairs on south side only, with a signalized mid-block crossing on the bridge connecting the north and south sidewalks and bike lanes

For the Draft EIS, the project team identified a representative option for each of these four groups to represent the full range of options. The performance and impacts of those representative options were analyzed and the results are documented in the EQRB Active Transportation Access Options Memorandum (Multnomah County 2021a). The description and findings are summarized in Chapters 2 and 3 of the Draft EIS.

While the Draft EIS discloses the range of impacts that could result from these access options, and will allow the public to comment on those impacts and options, there will likely be a need for additional public involvement before selecting which option advances to final design. There will also be a need for more detailed design to fully understand the cost and feasibility of various options before making a final decision.

In addition to the Eastbank Esplanade access options, there are several active transportation access options near the west end of the bridge. These options are also described and evaluated in the EQRB Active Transportation Access Options Memorandum (Multnomah County 2021a), and are summarized in Chapters 2 and 3 of the Draft EIS.

Construction Methods and Impacts

At this point in project development, there is always uncertainty regarding the exact construction means and methods, timelines, and other details. And yet, it is necessary to evaluate the potential construction-phase impacts so as to disclose potential impacts and to understand potential tradeoffs among alternatives. For this reason, the construction assumptions are generally conservative and may reflect over-estimated impacts. For example, the assumed duration of temporary closures of the Eastbank Esplanade, Burnside Skatepark, portions of Waterfront Park, the navigation channel, the MAX station under the bridge, local streets and other facilities may overstate the actual closure duration that will be needed. This will not be more precisely known until the final design is complete and a contractor has determined exactly how they will build the bridge, and even then, adjustments are not uncommon. The conservative assumptions that inform the analysis of short-term impacts in the EIS are intended to allow the flexibility needed given the current level of uncertainty.

Mitigation Decisions

It is standard practice in a Draft EIS to identify a range of potential mitigation measures that could help to avoid, reduce or compensate for adverse impacts, but to not yet commit to the final solutions. This is because there are multiple alternatives being considered and more analysis and coordination are needed to finalize the appropriate mitigation. Following the public comment period on the Draft EIS, further refinement of the PA design, and additional coordination with agencies, affected parties and the public, the proposed mitigation will be narrowed so that mitigation commitments can be made in the ROD. Even then, it will be necessary to leave some leeway for mitigation to be further refined during final design, permitting and construction contracting.

Off-Site Staging Areas

Off-site construction staging sites could be required due to limited storage space adjacent to the bridge. The location would be the contractor's choice so the exact location cannot be known at this time. The environmental technical reports and the Draft EIS identify and evaluate several potential locations for off-site storage to represent the likely type of sites that could be used, and the likely impacts. It is expected that any chosen river access staging site would allow that type of use, would not displace existing uses, and would already be developed for barge access as well as road access.

Completing Federal Regulatory Consultation Requirements

The project team has coordinated with federal and state resource and permitting agencies as well as other participating agencies and tribes. The Project's Agency Coordination Plan (Draft EIS Attachment F) defined the basic approach and coordination steps, and the EQRB Planning and Environment Linkages (PEL) Strategy (Draft EIS Attachment N) outlines the Project's approach for meeting the requirements for agency coordination and specific One Federal Decision guidelines during informal scoping.

PEL is a collaborative and integrated approach to decision-making that engages the public, agencies, and tribes, and considers environmental, community and economic goals starting early in the planning process and continuing through project development and delivery. Integrating these considerations and engaging stakeholders and agencies before formally initiating NEPA can result in a project that better incorporates multiple interests and objectives, while also reducing redundancy and the duration of the project development process. FHWA guidance, issued November 2016, prescribes a PEL approach based on 23 U.S.C. 168 as amended by the Fixing America's Surface Transportation (FAST) Act.[11] It is commonly referred to as "statutory PEL" or Section 168 PEL. Among other things, Section 168 PEL outlines requirements for pre-Notice of Intent (NOI) activities including how agencies can conduct planning-phase analyses and make planning-phase decisions that they can use in the subsequent environmental review phase.

[11] https://www.fhwa.dot.gov/hep/guidance/pel/pelqa2016.pdf

It lays out various requirements including notification and timing with an emphasis on public and agency involvement. The EQRB Project used a PEL approach to help implement the Executive Order (E.O.) 13807 directives noted above, such as the goal to complete the EIS process in not more than 2 years. To ensure compliance with the E.O. and to secure the benefits of linking planning and NEPA, the project team developed a PEL strategy to guide informal scoping work as well as post-NOI activities. This strategy, including a summary of updated progress through the NOI and formal scoping, is included as Attachment N to the Draft EIS.

Per One Federal Decision guidelines, the Project secured cooperating agency agreement on a permitting timetable with the USCG, the Army Corps of Engineers, and the National Marine Fisheries Service (NMFS), and secured their concurrence on the Project Purpose and Need, and the range of alternatives to be studied in the EIS. The project team will be seeking permits from multiple local, state, and federal agencies after the completion of the NEPA process.

In addition, the Project will need to complete two major federal approvals/agreements before FHWA can sign the ROD. Those include a Section 106 (of the National Historic Preservation Act) agreement regarding impacts to and mitigation for historic and archaeological resources, and a Biological Opinion that outlines the allowable impacts to fish or other species protected by the federal Endangered Species Act.

The Project has initiated consultation for Section 106 with Oregon SHPO and Consulting Parties. SHPO has concurred on the API and the Determinations of Eligibility (DOEs). The project has also identified effects and potential mitigation. Additional work and coordination to finalize the findings and a Memorandum of Agreement or a Programmatic Agreement for Section 106 will include:

- Request input and concurrence from the Oregon SHPO on the FOEs in February 2021.
- Invite the Advisory Council on Historic Preservation (ACHP) to review the DOEs, FOEs and potential mitigation measures in February 2021.
- Invite the public to comment on historic resource impacts and potential mitigation during the Draft EIS comment period in January/February 2021.
- Invite input from Consulting Parties, Oregon SHPO, ACHP and tribes on a draft 106 agreement March–June 2021.
- Finalize and sign a Section 106 agreement in August 2021.

The project team has also been coordinating with NMFS while preparing a Biological Assessment in compliance with Section 7 of the Federal Endangered Species Act. The Biological Assessment will be submitted to the NMFS in January 2021, and a Biological Opinion is expected from NMFS before the Final EIS is issued in October 2021.

Potential Changes in Lane Allocation

The analysis of future travel impacts is based on the existing transportation network combined with reasonably foreseeable future projects as described in adopted transportation and land use plans. Projects that are not in adopted and financially constrained plans are not considered to be “reasonably foreseeable”. However, it is possible that other projects, not in those plans, could occur within the planning horizon (2045) of the transportation analysis. For example, the City of Portland is studying the potential for implementing new transit-only lanes on various city roadways including the possibility of converting a general traffic lane into a westbound transit only lane on the Burnside Bridge. While this is just a study, and the project itself is not currently funded or considered reasonably foreseeable, the EQRB project team has coordinated with the City to ensure that the EQRB alternatives would not preclude the ability of the City to implement such a project in the future.

S.6 How the Draft EIS is organized

The core of the Draft EIS consists of three chapters:

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- **Chapter 1**, Purpose and Need for the Project. This chapter explains the problems that the project is addressing and the intended outcomes from project implementation.
- **Chapter 2**, Project Alternatives. . This describes the alternatives that are studied in the Draft EIS and identifies the alternative that has been recommended as the PA. It also summarizes the process followed during the 2018 Feasibility Study and subsequent informal scoping work to identify and screen potential solutions in order to reach the range of alternatives that are studied in the Draft EIS.
- **Chapter 3**, Affected Environment and Environmental Consequences. . This chapter summarizes the relevant natural, built, social and cultural environment and resources in the potentially affected area, and outlines and compares the impacts that would be expected from the different alternatives and options. It also identifies potential measures that could help to avoid, reduce, or mitigate the impacts.

Additional detail on the project alternatives and on the affected environment and impacts can be found in the EQRB technical reports listed in Attachment D of the Draft EIS and found on the project website. See the Draft EIS Table of Contents for a list of all of the Draft EIS attachments. Key attachments include:

- **Attachment G**, Detailed Graphics of Alternatives, which provides additional maps and figures to supplement the description of alternatives in Chapter 2.
- **Attachment H**, Preferred Alternative Memo, which provides more detail than Chapter 2 on the process used to develop a recommended PA and secure approval from various project committees as well as the Multnomah County Board of Commissioners.
- **Attachment I**, Summary of Permits and Clearances that the Project would be expected to need prior to construction.
- **Attachment J**, Summary of Potential Mitigation, which lists in one location all of the potential mitigation measures that are scattered through the different sections of Chapter 3.
- **Attachment K**, Public Involvement Summary
- **Attachment M**, , Draft Section 4(f) Analysis, which documents the Section 4(f) findings to date. Section 4(f) of the Department of Transportation Act, and subsequent regulations, apply specific requirements to minimize impacts to ("use" of) public parks and recreation resources and historic resources for projects that involve funding or other actions by the US Department of Transportation
- **Attachment N**, EQRB Planning and Environment Linkages (PEL) Strategy, which is also summarized above in Section S.5.