1. EXECUTIVE SUMMARY

In 2015, Multnomah County's Willamette River Bridges Capital Improvement Plan prioritized a Burnside Street river crossing that can withstand a major earthquake. To address this need, Multnomah County is conducting the Earthquake Ready Burnside Bridge (EQRB) project to provide the community with a reliable Willamette River crossing on the Burnside regional lifeline route.

Figure 1 below shows the schedule and phases necessary to complete this project.

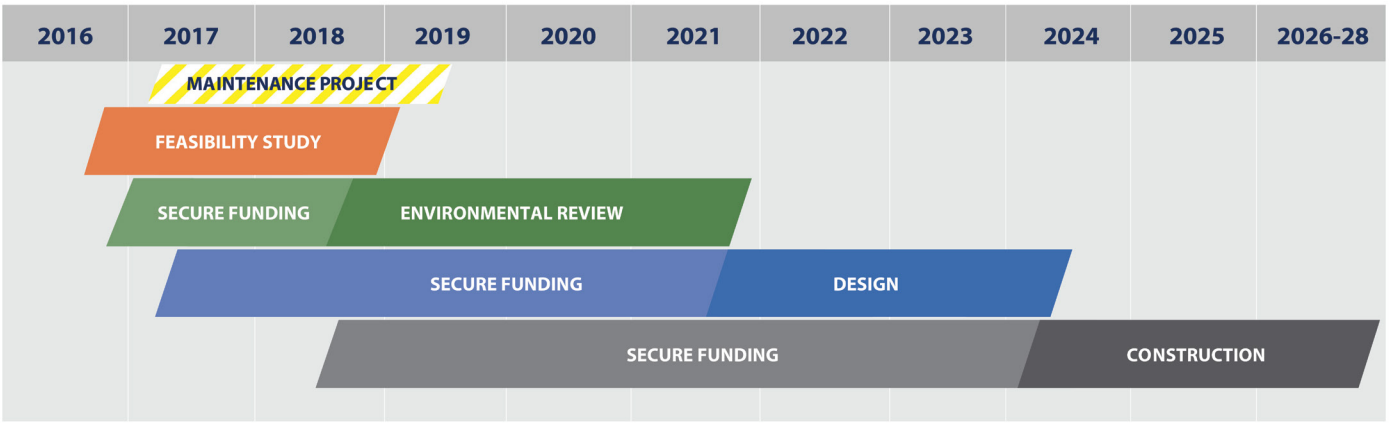


Figure 1: Project Schedule

The Feasibility Study phase began in fall 2016 and was completed in winter 2018. As part of the study, the Draft Feasibility Study Report was available to the public and project stakeholders during the month of September 2018 for review and comment at in-person and on-line open houses and on the project website. The Feasibility Study was completed in November 2018 after public and agency comments were received and the draft purpose and need and range of alternatives were adopted by the Multnomah County Board of Commissioners (**Appendix F**) for further study in the Environmental Review phase of the project.

Project Background

Oregon is located in the Cascadia Subduction Zone (CSZ), making it subject to some of the world's most powerful, recurring earthquakes. That is why Multnomah County is conducting the Earthquake Ready Burnside Bridge (EQRB) Project to provide the community with a reliable Willamette River crossing on the Burnside regional lifeline route after a major earthquake. During the Feasibility Study phase, the project team analyzed more than 100 Willamette River crossing options that resulted in four options being recommended for further evaluation in the Environmental Review phase. This report documents the alternatives development, screening process, screening results, and community and agency engagement process of the Feasibility Study phase.

The Feasibility Study included four major phases, as shown on **Figure 2.**

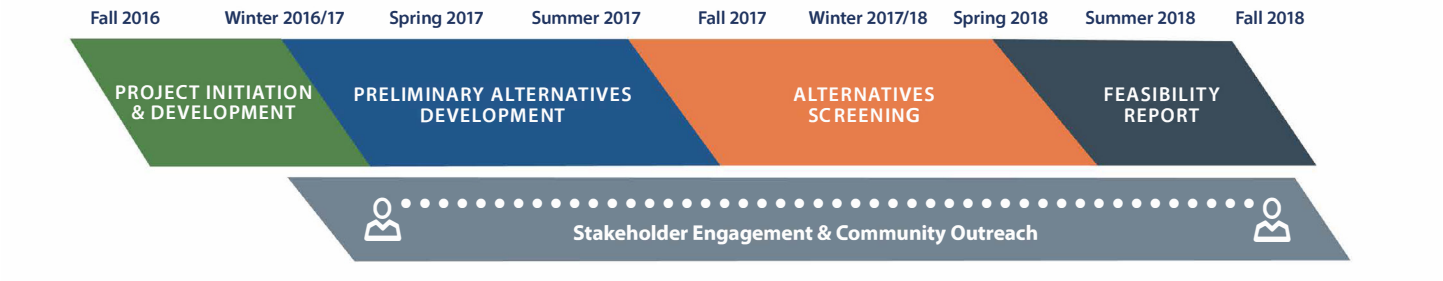


Figure 2: Project Milestones

1.1. PROJECT INITIATION AND DEVELOPMENT

During this phase, the project team worked with community and agency stakeholders to develop the project objectives and problem statement, as well as build project awareness through early engagement, which included shaping project key messages and identifying stakeholder interests.

1.2. PRELIMINARY ALTERNATIVES DEVELOPMENT

The following four steps were used to develop the alternatives list:

Step 1: Define the Alternative Groupings

The project team developed a comprehensive set of bundled alternatives, called alternative groupings, as follows:

1. **Preservation Alternatives –** this alternative grouping would implement standard preservation and maintenance to the existing bridge but would not involve seismic retrofit work.
2. **Seismic Retrofit Alternatives –** this alternative grouping would retrofit the existing bridge to make it seismically resilient.
3. **Replacement Alternatives –** this alternative grouping would replace the existing bridge with a new bridge or tunnel.
4. **Enhanced Seismic Retrofit Alternatives –** this alternative grouping would replace some sections of the existing bridge and retrofit all others.
5. **Enhance Another Bridge Alternatives –** this alternative grouping would replace and/or designate a different bridge (other than the Burnside Bridge), where traffic would be rerouted after a major earthquake.

Step 2: Identify Potential Crossing Alternatives

For each alternative grouping, the project team developed a list of potential crossing alternatives. For example, the "Replacement Alternatives" grouping consisted of "low movable bridge," "high fixed bridge," and "tunnel" options, while the "Enhanced Seismic Retrofit Alternatives" grouping considered various proportions of bridge retrofit versus replacement. For each potential crossing alternative, the following question was asked to establish a crossing profile:

- What is the alternative's clearance height over or under the Willamette River?

Step 3: Refine and Expand the Crossing Alternatives List

For each crossing alternative, the following questions were considered that led to an expanded suite of design options. These questions were as follows:

- Where does the bridge cross the Willamette River?
- How many bridges should there be?
- How should the roadway alignment be set?
- What overall bridge widths should be considered?

Step 4: Consider the Construction Method

For each crossing alternative, multiple construction methods were considered. These can generally be summarized as those that maintained traffic on site during construction versus those that detour traffic to another adjacent bridge during construction.

Figure 3, on the following page, illustrates the alternative groupings and subsequent crossing alternatives considered during the Feasibility Study phase.

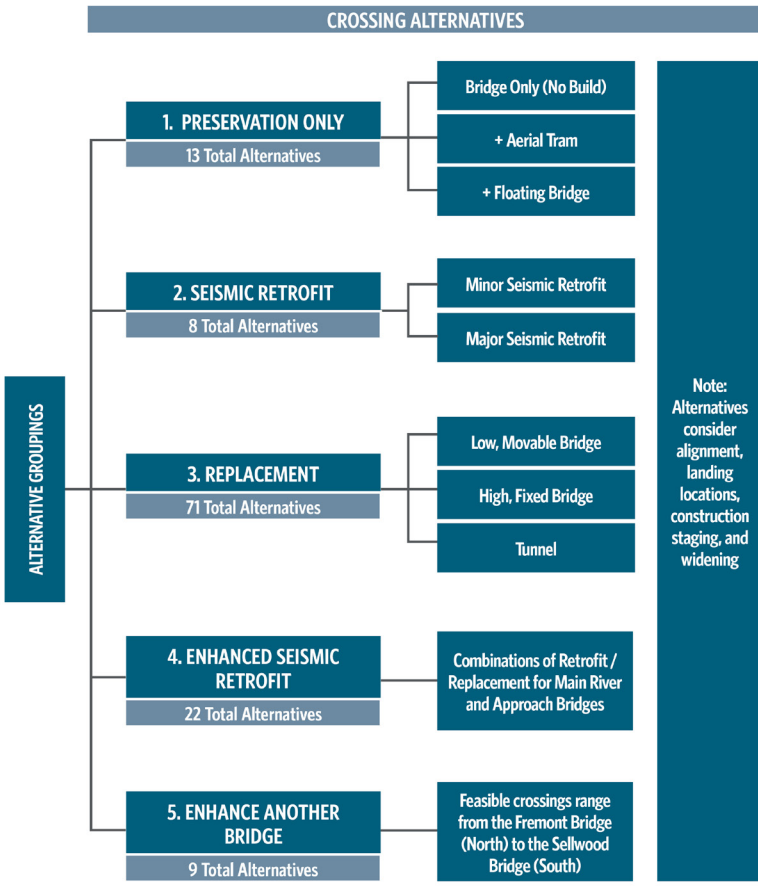


Figure 3: Alternative Groups and Crossing Alternatives

Alternative groupings: Five major crossing types.

Crossing alternatives: Specific river crossing alternatives within each grouping.

1.3. ALTERNATIVES SCREENING PROCESS

The alternatives screening process was conducted in three steps. Each step involved developing screening criteria and then applying them to the alternatives to eliminate unreasonable alternatives. Screening criteria were developed based on the project's problem statement, stakeholder interests, and technical considerations. This included input from stakeholder interviews and project committees, which are comprised of representatives from multiple local, state, and federal agencies, neighborhoods, business and citizen groups, special interest groups and social service providers, and on-line events.

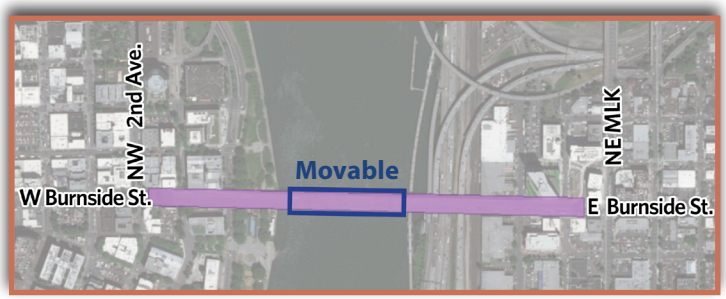
The ratings were informed through analysis based on aerial photos, plans and policies, existing data, maps, stakeholder input, and ArcGIS. The results were presented to the project committees for feedback and were shared publicly through on-line events and in-person open houses.

1.4. SCREENING RESULTS

The three-step screening process, including analysis and stakeholder input, led to the recommendation to advance the following bridge alternatives for further study in the Environmental Review phase.

Enhanced Seismic Retrofit

This alternative involves an upgrade of the existing bridge to meet current seismic standards. Because a retrofit over the I-5 corridor and railroad tracks is not feasible because of long-term closures of those facilities during construction, that portion of the bridge would be replaced.



Replacement: Fixed Bridge

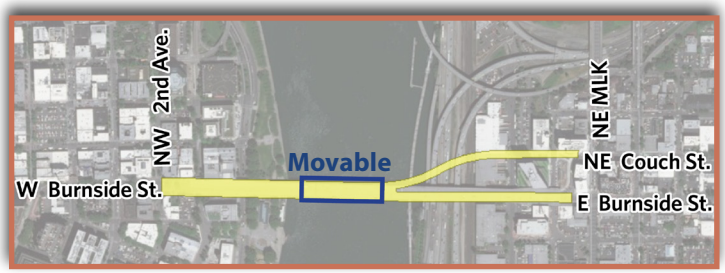
This alternative involves a new fixed bridge with a maximum clearance of 97 feet, at approximately the same location as the current bridge. The new bridge would not open but is tall enough to allow ships to pass without halting traffic. The west landing touches down about three blocks further west than the current bridge, near NW 5th Avenue.

Replacement: Movable Bridge

This alternative involves a new movable bridge at approximately the same height and location as the current bridge.

Replacement: Movable Bridge – NE Connection

This alternative involves a new movable bridge at approximately the same height as the current bridge. The east landing splits and connects to NE Couch Street. Westbound (WB) traffic enters from NE Couch Street.



1.5. COST ESTIMATES

Figure 4 contains the preliminary cost estimates for each of the four recommended alternatives. The dark blue columns represent the project cost if traffic were detoured to another site during construction, and the light grey columns represent the project cost if the alternative maintained traffic at the site during construction.

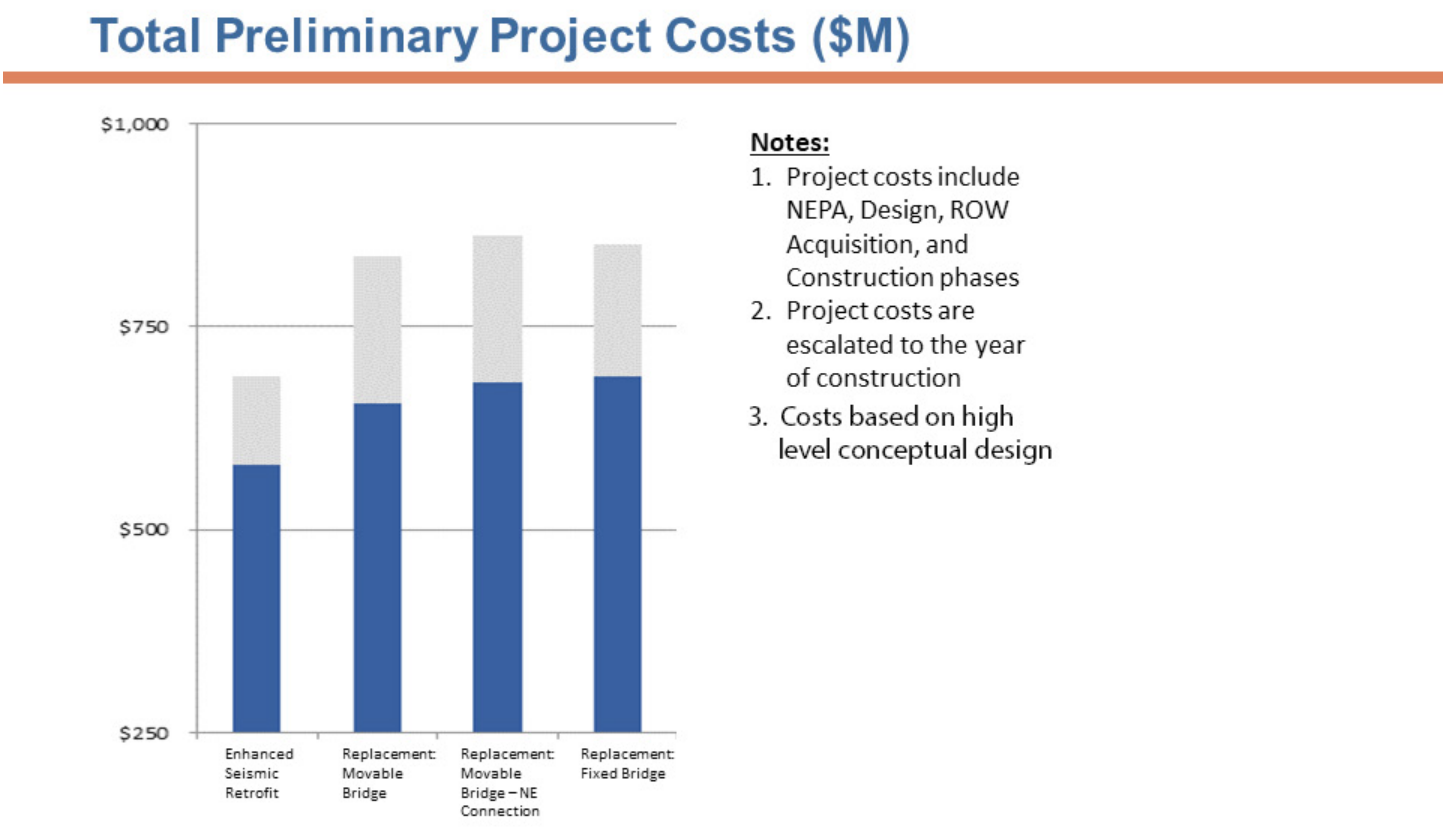


Figure 4: Preliminary Capital Costs

1.6. NEXT STEPS

The next phase of the project is the environmental review process. During this phase, the County will work with the public, regulatory agencies, special interest groups and other project stakeholders to further refine the recommended options and evaluate how they affect the environment and the community. This process will result in selecting a preferred option to advance into subsequent phases.