

1. Executive Summary

The Columbia River Crossing (CRC) project convened a panel of bridge and geotechnical engineers (the Panel) with relevant seismic design and retrofit experience to consider and discuss critical issues concerning the seismic vulnerability and retrofit possibilities of the existing I-5 Interstate Bridges.

The Panel was asked by the CRC project team to specifically address three questions. The questions and the responses from the Panel are as follows:

1. *Is it feasible to retrofit the existing structures? If so, how?*

Yes, it is technically feasible to retrofit the existing bridges to the current seismic safety standards. The Panel identified expected vulnerable elements of the bridges and discussed potential retrofit concepts to address these vulnerabilities. Retrofit concepts could include strengthening or replacing significant portions of the existing bridges.

2. *How would a retrofit affect the existing structure with regard to 4(f) sensitivities?*

For the purpose of protecting the structures' historic significance, the design effort can minimize changes in the structures' appearance. Examples of this include:

- Foundation and pier strengthening could follow the outline of the existing bridge elements, and although the resulting elements would be larger, there would be minimal visual impact.
- Bearing retrofit or replacement would be virtually unnoticeable to the untrained eye.
- If truss member strengthening and tower reconstruction is required, member shapes could be reasonably replicated.

3. *What is the cost to seismically upgrade the existing bridges?*

The Panel discussed and developed their opinion of estimated raw bridge construction costs to retrofit both bridges. This opinion ranges from \$88 million to \$190 million. This opinion of cost increases from \$125 million to \$265 million when design, permitting, right-of-way, construction inspection and management, agency oversight, and contingencies are added. (Note: The Expert Panel determined an opinion on ranges of construction costs and did not estimate the added costs.)

Discussion of these issues and others, including recommended next steps for more clearly defining the retrofit, if needed, are developed in more detail in the body of this report.