

I-5 Willamette River Bridge Project

Purpose and Need Statement

Purpose of the Project

The purpose of the proposed project is to improve safety and maintain connectivity and mobility for all users of Interstate 5 over the Willamette River in the Eugene/Springfield Metropolitan Area.

Need for the Project

The existing bridge has been decommissioned and the temporary detour bridge was not designed to withstand earthquakes. Currently average daily traffic (ADT) is about 49,000 vehicles on the interstate facility in the project area, and is predicted to increase to roughly 73,000 ADT by 2030 (20-year design).

The project is needed to meet state and federal safety and mobility policies. The existing interstate bridge is weight restricted and has been decommissioned so that heavy haul trucks must use the temporary detour structure built in 2004. The detour structure does not meet current seismic standards and the construction methods used met environmental requirements only as they apply to temporary, not permanent, structures. The decommissioned bridge (constructed in 1962) is structurally deficient and cannot feasibly be repaired or widened to accommodate traffic flow and capacity for the projected traffic demand 20 years into the future. For those reasons, the bridge has been slated for replacement. The temporary detour structure was completed in 2004 to eliminate a 200-mile detour for heavy haul truck traffic caused by the overloading of the existing I-5 bridge beyond applicable weight restrictions. The 200-mile truck detour represented an enormous economic impact to the state and region.

An inspection of the existing bridge in 2002 found the bridge to be structurally deficient, with poor superstructure and poor substructure. The bridge is cracked in many places: longitudinally throughout the deck; near joints; in sides of box near bearings; in the web ends of the girders; and in the caps. In addition, it was designed to the bridge standards of the time that are no longer sufficient for today's freight movement.

The bridge has a sufficiency rating of 20.00. Three primary factors make up a sufficiency rating: structural adequacy and safety; serviceability and functional obsolescence; and essentiality for public use. A sufficiency rating can not be less than 0 or greater than 100. A bridge qualifies for replacement funding from the Federal Highway Bridge Replacement and Rehabilitation Funding Program if it has a sufficiency rating of less than 50. A rating of 51 to 80 only qualifies for repair funding. A structurally deficient bridge does not necessarily result in a sufficiency rating of less than 50. However, if a bridge is deemed structurally deficient, and has a sufficiency rating of less than 50, it has an increased likelihood of being selected for replacement.

Table 1 provides data from the February 2004 Bridge Inspection Report (2002 inspection) supporting the need for the project. State and federal rating guideline

systems have been developed to aid in the inspection of bridges. The National Bridge Inspection Standards (NBIS) are federal regulations establishing requirements for inspection procedures and reporting. A 1-digit code on the federal Structure Inventory and Appraisal (SI&A) sheet indicates the condition of the bridge elements. For the bridge rail, transitions, approach rail and rail ends, rating codes include 0 (does not meet standards or a safety feature is required) and 1 (meets current acceptable standards). For the deck, superstructure, and substructure, rating codes range from 9 to 0, where 9 is excellent condition, 7 is good condition some minor problems, 4 is poor condition, advanced section loss, deterioration, spalling or scour, and 0 is failed condition.

Based on a review of these and other factors in the bridge inspection report data, the I-5 Willamette River Bridge is in need of replacement instead of being continually repaired and maintained. Replacing the cracked bridge with a new structure would greatly reduce the required regular maintenance costs; would provide greater public safety by using the most current design standards; and would decrease delays to the traveling public due to less required maintenance with a new bridge.

Table 1 - Bridge Evaluation Ratings and Remarks

APPRAISAL		NBI CATEGORY	
Appraisal	Rating	Category	Rating
Scour	5 Foundation stable/scour within	Deck	6 Satisfactory
Bridge Rail	0 Does not meet standards	Superstructure	3 Serious
Transitions	0 Does not meet standards	Substructure	3 Serious
Approach Rail	1 Meets acceptable standards	Channel	8 Bank well vegetated
Rail Ends	1 Meets acceptable standards	Culvert/Retaining Walls	N Not Applicable
Structural	2 Basically intolerable requiring high priority of replacement		
Deck Geometry	4 Meets minimum tolerable limits to be left in place as is		
Clearance	2 Basically intolerable requiring high priority of replacement		
Waterway	9 Superior to present desirable criteria		
Approach Alignment	8 Equal to present desirable criteria		

Remarks

Bridge Component	Deficiency Description
Decks	Longitudinal cracks throughout deck. Transverse and map cracking; some spalling next to joints.
Drains	Plugged and partially plugged drains.
Box	Flexural cracks in sides of box near bearings. Some minor spalling; on two occasions inspected inside box spans and found shear and flexural cracking 0.025" to 0.060"; between piers 3 & 4 there were at least ½ dozen 0.060" cracks in sides of box (could only access first 3 cells [no. west to east]); also moderate deflection in this span; installed crack gauge in one location.
Box	Crack gauges on 9/12/02 read 0, 1 on the box reading and 0,-0.25 on the cap.
PS Girders	Some cracking in the web ends of girders
Caps	Some cracking in caps w/efflorescence and minor cracking under bearings. (Some cracks marked July 1971.) During 5-30-02 inspection inside box found 0.125" shear crack through pier 3 cap and utility hole (under southbound lane); installed gauge.
Joints	Several joints are spalling low & leaking. Inspected underside and top of deck, many of the headers are breaking up.

Goals & Objectives

The goals and objectives listed below for the I-5 Willamette River Bridge project were developed after consulting the public, local jurisdictions, and resource and regulatory agencies. The goals and objectives help ODOT identify and respond to key issues and concerns as the project is developed.

Transportation and Mobility

Goal 1: Provide transportation facilities that complement and support State and local transportation systems and land use planning.

- Objective 1A: Meet Oregon Highway Plan mobility and access standards and policies for interstate highways to maintain an acceptable and reliable level of mobility now and in the future.
- Objective 1B: Accommodate transportation improvements planned for railroads, streets, highways, interchanges, and bicycle/pedestrian paths in the area.
- Objective 1C: Provide a freeway bridge and potential associated roadway improvements that are safe and effective.
- Objective 1D: Maintain and where practicable enhance connectivity for pedestrians and bicyclists during and after construction.
- Objective 1E: Keep bicycle paths open during construction and make them safe and compatible with long term usage.

Natural Resources

Goal 2: Avoid or minimize impacts to natural resources.

- Objective 2A: Avoid or minimize adverse impacts to the Willamette River and its tributaries, Patterson Slough, riparian areas, upland native plant communities, and wetlands, and fish and wildlife in the area.
- Objective 2B: Eliminate or minimize the number of bridge piers in the Willamette River.
- Objective 2C: Minimize adverse alterations to river hydraulics.
- Objective 2D: Take advantage of practical opportunities to enhance habitats for native plants, fish, and wildlife.
- Objective 2E: Mitigate unavoidable impacts to the natural environment.

Recreation

Goal 3: Protect and enhance recreation resources and the recreational experience of users in the vicinity of the project.

- Objective 3A: Protect and, as practical, enhance the pleasant pastoral character of the Whilamut Natural Area of Alton Baker Park (including Eastgate Woodlands Park).
- Objective 3B: Maintain access to park facilities during construction and minimize adverse construction impacts to park users.
- Objective 3C: Maintain or improve safety for river users.
- Objective 3D: Take advantage of practical opportunities to enhance the park environment and further park planning goals.

Aesthetics

Goal 4: Provide an aesthetically pleasing solution that recognizes the scenic beauty and community significance of the project area.

- Objective 4A: Design and construct a structure that can enhance the views from the river and surrounding areas.
- Objective 4B: Design and construct an aesthetically pleasing structure that is a signature or landmark bridge -- a unique and special structure that represents the community.
- Objective 4C: Design and construct a structure that is aesthetically pleasing when viewed from the underside where most people will see it.

Project Design, Construction, and Operation

Goal 5: Provide a sustainable, cost-effective solution that has performance durability during its expected design-life, minimizes construction impacts, and can be safely constructed and operated.

- Objective 5A: Minimize the impacts of construction staging and access disruptions on park users and neighborhoods.
- Objective 5B: Minimize noise impacts during construction and long-term operations.
- Objective 5C: Meet Oregon Freight Mobility Standards on I-5 during construction by minimizing traffic delays and detours.
- Objective 5D: Include design elements that discourage transient camping under the bridges.
- Objective 5E: Design and construct an affordable, cost-effective project.
- Objective 5F: Provide a facility that is easily maintainable.
- Objective 5G: Incorporate materials and construction techniques that allow for maintenance and sequential replacement of elements as needed to extend the lifespan of the structure.