



Interstate 5 Willamette River Bridge CM/GC

The Whilamut Passage Bridge
Eugene/Springfield, Oregon

By Linda Scronce-Johnson and Nichole Hayward | Based on interviews with Karl Wieseke, Oregon Department of Transportation and Jeff Firth, Hamilton Construction Co.

\$18M Under budget for construction

4 Months ahead of schedule

30 million Pounds of wood, concrete and steel repurposed

INSIDE:

- project information
- successes
- lessons learned
- insights into:
 - reducing costs through cooperation
 - community involvement
 - technical innovation
 - sustainable practices
- interview excerpts



PROJECT INFORMATION

SCOPE

- Largest bridge replacement project undertaken by the Oregon Department of Transportation
- ODOT's first project using Construction Manager/General Contractor (CM/GC) delivery
- Design and construction of uniquely designed 2,000-foot arch span bridges under heavy traffic
- Demolition of four bridges
- Construction of commuter bicycle-pedestrian paths including a new viaduct
- Environmental enhancement of riverbank and 237 acres of public open space
- Large public art installations

TEAM/BUDGET/SCHEDULE

- Owner: Oregon Department of Transportation / Oregon Bridge Delivery Partners (HDR-Fluor)
- CM/GC Contractor: Hamilton Construction Co. / Slayden Construction
- Lead Engineer: OBEC Consulting Engineers / TY Lin International
- Final Construction Cost: \$150 million
- Schedule: 2009 - 2014

CHALLENGES

- Numerous environmental considerations and site constraints
- First CM/GC project for owner and contractor
- Unique construction challenges due to design
- Highly engaged community
- Multiple jurisdictional overlap

SUCCESSSES

- ✓ The project delivery method allowed the team to start construction two years ahead of schedule while design was still underway and to open to traffic nine months ahead of schedule.
- ✓ Despite its unique challenges and complexity, the project was completed four months early and \$18 million under budget.
- ✓ Exceptional quality control as a result of collaboration led to no non-conformance reports and zero construction claims.
- ✓ The project maintained an excellent safety record: During the 351,192 total hours worked by Hamilton Construction, only one lost-time injury occurred on the job.
- ✓ A notable strength of this project was advancement in the area of environmental practices, which proved that productivity, safety, cost and sustainability are mutually compatible.
- ✓ The project exceeded stakeholder expectations.

LESSONS LEARNED

DOs

- ✓ Select partners who possess a strong team orientation
- ✓ Engage all stakeholders as early as possible in the process

- ✓ Develop a conflict resolution process early on

DON'Ts

- ✗ Switch drivers mid-project; strong team dynamics are based on leadership continuity from the beginning of procurement to the completion of construction



INSIGHTS INTO:

REDUCING COSTS THROUGH COOPERATION

- Colocation and regular team meetings promoted increased and more efficient communication.
- Frequent and timely communication resulted in fewer change orders.
- Collaborative risk management resulted in reduced contingency fees by assessing each risk early on and identifying which team member was best suited to manage each risk most effectively.
- Constructability reviews early on allowed less costly design alternatives that met owner performance criteria.
- The ability to begin construction before completion of design and, in turn, continue design during construction allowed greater flexibility to capitalize on cost-effective innovation.
- Closer working relationships helped stakeholders understand the hidden cost impacts of their decisions and avoided “silo thinking.”
- With all the players at the table, the CM/GC team could quickly assess or mitigate construction impacts, making regulatory streamlining and resultant cost savings possible.

COMMUNITY INVOLVEMENT

Extensive community involvement resulted in elements added mid-project. The most significant example of this was a new \$4 million bike path on the south side of the Willamette River. The addition affected pile driving, crossed over a stream restoration project in process and affected staging on the main bridge. But the delivery team was motivated to work with the community, and the CM/GC process provided the flexibility to find a way to make the bike path a reality. The team was able to identify cost savings through a series of Value Engineering propositions, including using girders salvaged from the demolished old bridge. The project was fortunate to receive additional funds secured by Oregon’s U.S. Rep. Peter DeFazio to improve the aesthetics for the project. The new bike path stands as a testimony to the power of collaboration.

TECHNICAL INNOVATION

Supplier and subcontractor collaboration was a key element of success on the Willamette River Bridge project. Hamilton and ODOT worked closely with the concrete subcontractor, Knife River, to test 80 mixes and innovative application methods. The southbound bridge features 17 specialized concrete mixes customized for each component — drilled shafts, columns, arches and deck — selected from 27 options.

SUSTAINABLE PRACTICES

Hamilton facilitated constant open communication, information sharing, and collaboration. Having everyone at the table, including regulatory agencies in some cases, enabled the development of notable innovations for protecting the environment:

- ✓ A noise attenuation system developed by Hamilton Construction and dubbed the “bubbleator” created a bubble curtain to protect fish from the impact of pile driving.
- ✓ A previously untried method of wire sawing to remove old bridge piers proved environmentally safer than traditional in-place concrete breaking.
- ✓ Fully contained work bridges protected the river from construction debris and contaminated run-off.
- ✓ Safer vegetable-based oil products in lieu of petroleum powered equipment used near the river.
- ✓ Materials from the demolition of the old bridge found new life through recycling, reuse and repurposing, included a new pedestrian bridge from reused beams and steel.
- ✓ Installed bat boxes designed specifically for endangered bat species provided habitat on the new structures.

“Not only is the Interstate 5 Willamette River Bridge replacement project complicated — it is located between two cities; crosses a set of railroad tracks, a four-lane boulevard and a river; and is flanked by two parks — but it is also ODOT’s first construction manager/general contractor bridge project. We’ve learned that the success of a CM/GC project depends on the strength of the partners. In Hamilton ODOT has a partner that has exceeded our expectations. From its commitment to the community, to its flexibility and responsiveness to design challenges, Hamilton has been instrumental in this project’s success.”

— *Matthew Garrett, Director, ODOT*

“The arch deck design was applauded by designers and the community for its beauty — and by environmentalists for its low impact to the river.”

— *Jeff Firth, Project Manager,*

Hamilton Construction Co.

“It might be said the community’s contribution to the contractor was equal to the contractor’s contribution to the community, and the synergy resulted in a process that brought people together and a product that surpassed all expectations.”

— *Karl Wieseke, Senior Project Manager,*

ODOT

“I learned more about bridges that I thought possible. Hamilton’s staff helped us to all learn the foreign language of bridge building and how the parts all fit to make a strong bridge.As a member of the local community, I felt a valued member of the team that worked on the Whilamut Passage Bridge project.”

— *Vicky Mello,*

Citizen Advisory Group member

Case Study in Collaboration

During pre-construction design constructability reviews, Hamilton’s Construction Manager Con O’Connor identified that the narrow configuration of Bent #2 on the proposed arch bridge would present challenges for the concrete pour. He expressed his concerns, but felt that Hamilton could identify and address any problems by building a practice “mock up” column pour. Unfortunately, when the time came for the actual Bent #2 pour, the process failed to deliver acceptable quality results. Hamilton readily accepted responsibility for the problem. The Hamilton team worked with the owner and the inspectors to correct the problem — which they did successfully. Hamilton accepted its role of accountability on the problem, paid the extra expense without argument and construction proceeded. ODOT PM Karl Wieseke said he was impressed.

“Con walked into my office, sat down and told me there was a problem and it was his problem. Another contractor would have tried to make it a contractual issue, but not Con. He was straightforward with me. He treated me the way I wanted to be treated — with integrity.” Wieseke said that particular incident set the tone for trust on the project.

“How do you develop trust?” Wieseke asked rhetorically. “Someone has to go first.”

“Thanks for showing the nation how to put innovation to work!”

Federal Highway Administrator Victor Mendez said as he recognized the success of the CM/GC team at the project’s opening ceremonies.