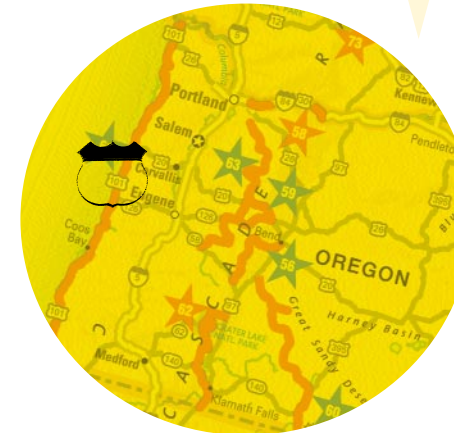


VALUING THE RESOURCE AND PARTNERING FOR SUCCESS



BYWAY LENGTH: 360 MILES

IN OREGON, PUBLIC CONCERN ABOUT THE REPLACEMENT OF THE HISTORIC ALSEA BAY BRIDGE LED TO A CONCERTED EFFORT BY THE OREGON DEPARTMENT OF TRANSPORTATION TO PRESERVE AN ENTIRE COLLECTION OF HISTORIC OREGON COASTAL BRIDGES

In 1991, U.S. 101 became Oregon's first state byway. Designated a National Byway in 1998, the Pacific Coast Highway stretches the entire three hundred sixty mile length of U.S. 101 from Oregon's border with Washington to its border with California.

Starting in Astoria and traveling south to the California border, the byway provides spectacular views of the coastal scenery. The road winds by estuarine marshes, clings to exposed seaside cliffs, passes through gentle agricultural valleys, and brushes against wind-sculpted dunes.

In the 1930s, Conde B. McCullough, an Oregon Department of Transportation (ODOT) bridge engineer set about the task of completing what is now known as the Pacific Coast Highway. To link the roadways, McCullough designed a series of bridges ingenious in both their engineering and aesthetic form.

Many of these bridges still stand today as outstanding examples of their era of construction, proud achievements and historic legacies. Embellished with Art Deco ornamentation and decorative railings, the bridges reflect the grandeur of their setting and span gracefully over the landscape.

PROJECT: Preservation of Oregon's Historic Coastal Bridges Through Restorative Technologies

BYWAY: Pacific Coast Scenic Byway (U.S. 101)

STATE: Oregon

STARTED:
BID LET DATES: DEPOE BAY BRIDGE: 1993, YAQUINA BAY BRIDGE: 1991 AND 1995 (LET IN 2 PHASES) CAPE PERPETUA HALF VIADUCT: 1997, BIG CREEK BRIDGE: 1997

COMPLETED:
DEPOE BAY BRIDGE: 1997, YAQUINA BAY BRIDGE: 1995 AND 1997, CAPE PERPETUA HALF VIADUCT: 1997, BIG CREEK BRIDGE: 1998

TOTAL COST: \$21.8 million

State DOT Bridge Funds: \$ 4.4 million
 Bridge System On System (118): \$13.5 million
 Bridge System On or Off System (114): \$3.9 million

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* Restored 4 historic bridges along the Oregon coast
 designed by Conde B. McCullough to favor ODOT bridge expansion

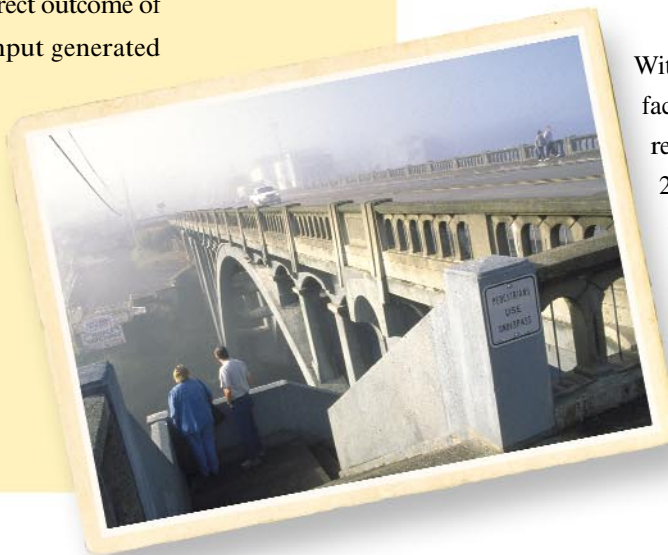
* Carefully replaces the missing and damaged concrete
 (damaged from years of exposure to salt water) to closely match
 coastal atmosphere





PROJECT FEATURES:

- Restores four historic bridges along the Oregon Coast designed by Conde B. McCullough (a former ODOT bridge engineer)
- Carefully replaces the missing and damaged concrete (damaged from years of exposure to high chloride laden coastal atmosphere) – finished surfaces closely match their original design
- Combines an arc-sprayed zinc anode with active current supply cathodic protection to preserve the restoration – includes monitoring systems for remote data retrieval for ODOT to watch the sites and analyze their results
- Project is a direct outcome of community input generated during the Alsea Bay (Waldport) Bridge replacement



What Happened

After over fifty years of service, many of McCullough's bridges were in a state of serious decline due to corrosion from prolonged exposure to salt. In 1985, with no solution at hand, the Oregon Department of Transportation hired a consultant to design a replacement structure for one of McCullough's masterpieces, the Alsea Bay (Waldport) Bridge. Outraged by the potential loss of the historic resource, the public advocated its rescue. Unfortunately, the bridge was beyond repair.

Recognizing the need for a comparably aesthetic structure, the DOT and its consultant worked closely with the public to design the new bridge. Completed in 1991, the bridge embodies all the grace, style and elegance of its predecessor. To preserve an important link to the past, salvaged pieces of the old bridge including pylons, spires, and railings were incorporated into the new bridge and used to punctuate an overlook located at the northwest corner of project. To ensure that the story of the old bridge was not forgotten, ODOT constructed the Alsea Bay Bridge Interpretive Center. Located at the southwest end of the structure, the Center complements its displays of the Old Alsea Bay Bridge project with information about Oregon's ongoing efforts to preserve its coastal bridges.

With several other historic coastal structures facing a similar fate, ODOT committed not to repeat the Alsea Bay Bridge loss. As part of its 2020 plan, the agency has set the goal of completing the restoration of all historic coastal bridges. While work was underway on the new Alsea Bay Bridge, a Bridge Preservation Team was formed to find ways to preserve, and restore these and other significant Oregon bridges.

PARTNERS

Oregon Department of Transportation
Coastal Policy Advisory Committee on Transportation
Oregon State Historic Preservation Office
Oregon Fish & Wildlife
U.S. Fish and Wildlife Service
U.S. Coast Guard

IMPORTANT PEOPLE

Thomas Lulay
Bruce Johnson
Frank Nelson
Donald Lowe
James Norman
Lea Ann Hart-Chambers
Mark Hirota

At the outset, the Bridge Preservation Team gathered information on other state's efforts in protection and restoration. Based on this data and recent innovations, the agency began work on the initial coastal bridge projects.

Each of these projects was designed to carefully replace the missing and damaged concrete so that the finished surfaces closely match their original design. The work was performed under full environmental containment of all project materials from streams and estuaries. ODOT's implementation approach was one of closely controlled concrete repair using pneumatically applied (or formed) concrete, mixed to match the existing bridge's chloride content and finished to closely match the original lines of the structure. The installation of an active current cathodic protection system using an arc-sprayed zinc anode followed to preserve the restoration work. Seismic retrofitting, securing the beams to their seats, was added to further protect the structures. Permanent monitoring equipment was also installed to permit remote data collection to enable ODOT to analyze their results.

Project Benefits

We were facing a huge problem, so we listened, worked hard and found a solution, so that Oregon citizens could continue to love these bridges.

— Lea Ann Hart-Chambers, Oregon Department of Transportation

The restoration and preservation techniques employed by ODOT will greatly extended the life of these historic bridges, many at a cost less than replacement. Revered local attractions, the bridges are featured on a variety of promotional items and play a significant role in promoting coastal tourism and drawing visitors to the state. To educate visitors on the work being undertaken, interpretive materials have been developed and installed at the Alsea Bay Interpretive Center and the Yaquina Bay Lighthouse State Park. ODOT is currently in the process of assessing the timing and funding of a brochure to depict the significance of the coastal bridges to the Pacific Coast National Scenic Byway and the efforts undertaken by the Bridge Preservation Team.

As Oregon works toward its 2020 goal to complete the restoration of all historic coastal bridges, ODOT has ongoing project sites at Rocky Creek (Ben Jones) Bridge, the Cummins Creek Bridge and the Rogue River (Gold Beach) Bridge. At the same time, the DOT's program is replacing non-historic coastal bridges with more aesthetically pleasing structures employing innovative corrosion engineering to provide a design life of one hundred twenty years. The Brush Creek Bridge, the first of these new structures, was completed in 1999. Haynes Inlet Slough Bridge just north of the McCullough Memorial Bridge in Coos Bay is currently in construction. The Cooks Chasm Bridge is scheduled for Fall, 2001 and the Spencer Creek Bridge is anticipated to follow by 2003.

Partners

The biggest success of this project is that engineers, historians, environmentalists, and local communities were able to partner together and create the solution they needed.

— Lea Ann Hart-Chambers

This project involved many regulatory entities whose permission and permits were required. From the Oregon State Historic Preservation Office, whose concern is the preservation of historically significant works, to the U.S. Coast Guard concerned about vessel clearance, to Fish and Wildlife concerned with endangered species and habitat, to those seeking opportunities to further research efforts on the technology

applied, to businesses and residents who lived near the project sites, ODOT listened carefully, and worked to integrate their needs into a project that would provide long-term benefits in a cost effective manner that satisfied all parties.

To accomplish this, ODOT also worked closely with the Federal Highway Administration to facilitate the implementation of new technology and garner the design exceptions that were required for the project work.

Considerations

SEE A NEED AND RESPOND TO IT BEFORE IT IS TOO LATE.

The loss of the Alsea Bay Bridge signaled the need to do more to protect Oregon's significant bridges. Recognized as the intrinsic theme that threads together the length of the Pacific Coast

National Scenic Byway, loss of additional coastal bridges would have meant the loss of significant state resources. Formation of the Bridge Preservation Team was the first step in coordinating efforts to preserve and restore similar structures throughout the state.

KEEP THE PUBLIC ENGAGED AND INFORMED DURING THE PROCESS.

This project resulted from the community involvement generated during the Alsea Bay Bridge replacement project. Recognizing that the community valued the coastal bridges as significant state resources, ODOT worked with the public to solicit their input and keep them apprised of project progress. To help the public visualize special bridge replacements, ODOT takes photos of the existing bridges and utilizes digital imagery to illustrate how the new bridges will look. This really helps the public see and understand what the engineers are talking about.

PARTNER FOR SUCCESS. The list of individuals and agencies that contributed to this project is long and could be considered a study in the cooperation efforts that are required when the problem at hand requires a solution that has not been traditionally applied before.

ENVIRONMENTAL NEEDS ARE EQUAL TO TECHNICAL NEEDS.

All of the work on the bridges was performed under full environmental containment of all debris and project materials from streams and estuaries. During this project, ODOT also met with a number of regulators and environmental groups to address area specific concerns. On Big Creek Bridge, the highly rare and endangered Oregon Silver Spot Butterfly had an active habitat, one of only three known, directly under the Bridge. Working with U.S. and Oregon Fish and Wildlife, ODOT decided to restore the less noted McCullough structure rather than potentially disrupt the critical habitat.

RESEARCH YOUR OPTIONS TO FIND THE RIGHT SOLUTION.

Oregon's Bridge Preservation Team started out by gathering information on other states' efforts in protection and restoration and used this data to help inform the project.

KEEP REFINING AND TESTING NEW METHODS. The permanent monitoring equipment enables ODOT to study the bridges and consider future modifications. Sharing this technology with others also provides a forum for information exchange. ODOT staff has participated in research, written technical papers and made numerous presentations on the bridges included in this project.

