

## 2015 BRIDGE CONDITION REPORT

# EXECUTIVE SUMMARY

**M**aintaining good bridges is critical to a strong economy and to preserving safe and reliable travel. Deteriorated bridges can impede mobility and force trucks to detour, costing businesses time and money. Measuring the current health of Oregon's bridge population enables the Oregon Department of Transportation to track conditions over time to determine bridge rehabilitation and replacement needs.

ODOT's 2015 Bridge Condition Report summarizes bridge condition ratings on state highways and performance measures based on National Bridge Inventory and ODOT data. As a consistent reference point for evaluation, ODOT uses the bridge conditions snapshot provided annually to the Federal Highway Administration. Data from the April 2015 submittal is the basis of this report.

### Measuring Bridge Conditions

ODOT measures bridge conditions using two categories of characteristics:

- ▶ Structurally deficient as defined by the Federal Highway Administration — meaning the bridge has deteriorated deck, substructure or superstructure that requires repair.
- ▶ Other deficiencies as defined by ODOT, including freight mobility, bridge safety and serviceability needs.

A distressed bridge is one that is rated as structurally deficient or has at least one other deficiency. ODOT targets both aspects in determining bridge needs and selecting projects for the Statewide Transportation Improvement Program.

**Projections show significant deterioration in Oregon's bridge conditions in the next several decades.**

### Current Conditions

Oregon's state highway bridge conditions have improved since 2007. A significant increase in bridge program funding from the 2003 Oregon Transportation Investment Act (OTIA III) and special federal funding in 2008 and 2009 resulted in the largest spike of new bridge construction since the 1960s.

The \$1.3 billion OTIA III State Bridge Delivery Program, completed in 2014, addressed aging bridges on Oregon's highway network. The program repaired 122 bridges and replaced 149 — about 10 percent of the 2,727 bridges on the state highway system — improving bridge conditions while increasing safety and facilitating the free movement of goods.

These new bridges and a large number of rehabilitation projects have improved Oregon’s current bridge conditions. In 2015, 79 percent of state highway bridges, 86 percent of bridges on interstate highways and 79 percent of bridges on the National Highway System are not distressed. The improvement trend, however, is not expected to continue in the long term.

## An Aging System and Declining Revenue

While the OTIA III bridge program allowed for a significant, if temporary, “catch-up” in bridge conditions on important freight routes, projections show significant deterioration in conditions in the next several decades due primarily to aging structures and reduced funding.

More than half of the bridges in the state’s current inventory were built prior to 1970 (Figure 1), and 57 percent will reach the end of their design lives by 2020. Of those, 18 percent are currently one point away from structural deficiency. Each year, about 0.5 percent of the state’s bridges — about 14 structures — deteriorate to the point of becoming structurally deficient. By 2020, that rate is expected to increase to 2.5 percent or close to 70 structurally deficient bridges each year.

## Interstate-Era Bridges

With increased maintenance and repair, most of ODOT’s bridges can have a longer service life. But this does not hold true for a large number of bridges constructed during the Interstate-era of the 1950s and 1960s that are still in use today.

Many of these bridges were designed for loads smaller than allowed by state law since the mid-1980s. Preserving them is not cost effective because of their design details. Bridges with so-called “poor details” have higher incidences of

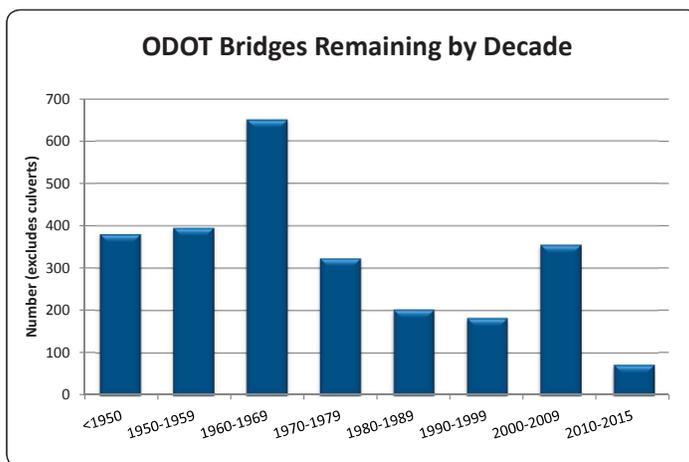


Figure 1. More than half of Oregon’s bridges were built prior to 1970, and more than 1,000 were built during the Interstate-era.

cracking that may grow rapidly, holes in thin bridge decks developing without warning, load capacity issues and instability during earthquakes. Of the 1,101 bridges built in the 1950s and 1960s in Oregon, 490 have poor details. These interstate-era bridges will continue to deteriorate, creating a backlog of preservation and replacement needs.

**Funding levels for 2015-2017 are lower than at any time since the mid-1990s.**

### Reduced Funding

Historically, funding for the state bridge program is below the level needed to maintain current conditions. Under the OTIA III bridge program, the state turned to significant bond funding to improve bridges on freight routes, including those on the interstate system, to acceptable conditions. Today's declining revenues combined with dedicating bridge funding to repay bond debt exacerbate an already unsustainably low funding level.

Funding levels for 2015-2017 are lower than at any time since the mid-1990s, and inflation has further reduced purchasing power. Oregon needs significant increased investment to maintain the service level of our aging bridges and to get ahead of the wave of pending deterioration.

### Projected Conditions

Predicting bridge conditions over time is challenging, but a general trend emerges based on the aging system and the large number of interstate era bridges.

Bridge conditions are projected to continue to decline significantly in coming years (Figure 2). Current funding levels allow preservation on many bridges, but more extensive work is required as time passes, reducing the number of bridges ODOT can address. As the

number of bridges with other deficiencies levels off over time, significantly more become structurally deficient. By 2050, more than 70 percent of Oregon's state highway bridges are expected to be distressed.

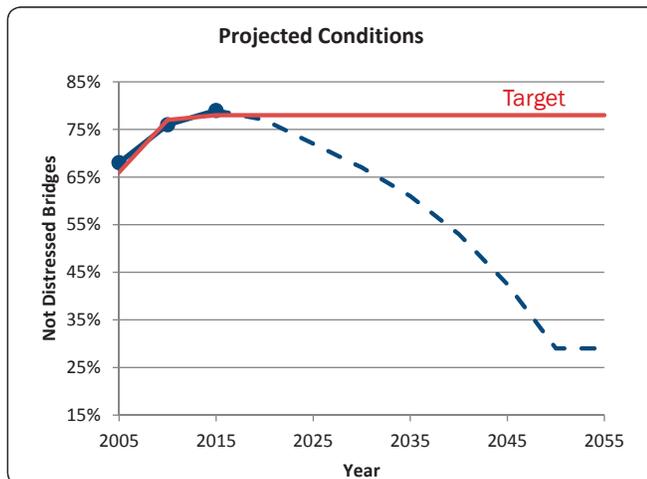


Figure 2. Based on general conditions, the percentage of non-distressed bridges is projected to decline steadily.

### Implications of Reduced Funding

Over the next two decades, ODOT expects approximately 900 state highway bridges to require repair or replacement, but limited funding will allow us to address only about 300 of these. Deferred maintenance will eventually require the bridges ODOT can't repair to be weight restricted to heavy trucks, causing significant disruption to Oregon's trade-based economy.

The consequences of reduced bridge funding are significant, including:

- ▶ Long delays to the traveling public associated with closures and emergency bridge repairs.

- ▶ Increased costs to businesses when trucks are detoured or forced to break up large loads to avoid weight-restricted bridges.
- ▶ High costs for reactive repairs to an ever-increasing number of deteriorated bridges.

**Deteriorating bridges could cost the state 100,000 jobs and \$94 billion in lost production by 2035**

Worsening conditions will increase transportation user costs and hurt Oregon's economy. Economic analysis has indicated that the state could forfeit 100,000 jobs and \$94 billion in production by 2035 as a result of deteriorating bridges.

Delayed preservation increases the frequency of reactive work, which leads to further delays to the traveling public. Depending upon the nature of the needed repairs, reconstruction could require full bridge closures. The cost of restoring an under-maintained bridge to normal operation is much greater than the cost of properly maintaining it over time.

## Preservation Strategies

In response to reduced funding, in 2011 ODOT proactively revised its strategies to preserve the significant number of bridges nearing the end of their service lives. We adopted seven strategies for bridge preservation:

- ▶ Protect high-value coastal, historic, major river crossing and border structures.
- ▶ Employ Practical Design guidelines and fund only basic bridge rehabilitation projects and rare replacements.
- ▶ Prioritize maintenance on the highest priority freight corridors.
- ▶ Develop a bridge preventive maintenance program.
- ▶ Raise awareness of the lack of seismic preparation.
- ▶ On low-volume bridges, address only significant structural problems to protect public safety.
- ▶ Monitor the health of bridges.

An emphasis on preservation with rare replacements brings with it a new set of strategies and problems. ODOT has been successful at reducing bridges in poor or structurally deficient condition but maintaining bridges in good repair has been challenging, which indicates that bridge preservation actions are not occurring at a rate necessary to maintain current conditions.

## Sustainable Bridge Program Needs

At current funding levels, only a small percentage of bridges in the system receive treatment beyond basic maintenance activities. As shown in Figure 3,

ODOT is able to complete preservation projects on just 0.7 percent of bridges each year. Bridges should receive major preservation every 30 to 50 years, but at the current rate it will take well over 100 years to get to each bridge just once.

To replace each state highway bridge on a 100-year cycle would require replacing an average of 27 bridges each year, but ODOT currently has

funding to replace an average of three bridges per year. At the current rate of replacement – about 0.1 percent per year – state highway bridges will have to last more than 900 years on average.

Simply to maintain Oregon’s aging bridges in their current condition, ODOT would need to spend an estimated average of \$240 million each year for the next two decades. Such spending would require approximately \$180 million in additional funding for state highway bridges.

Limited funding has prevented ODOT from managing near a sustainable level, and based on current funding levels, the number of bridge preservation and replacement projects will not increase significantly. Oregon needs dedicated and sustainable funding that will allow ODOT to implement a comprehensive strategy to fix bridges for the long term.

### **In this Report**

The 2015 Bridge Condition Report includes discussion and charts presenting bridge conditions across the state. Structurally deficient interstate and National Highway System bridges are listed in separate tables in addition to the district-level reports. The appendices include detailed information regarding programmed projects, Oregon’s restricted bridge list, the rating systems and other background information.

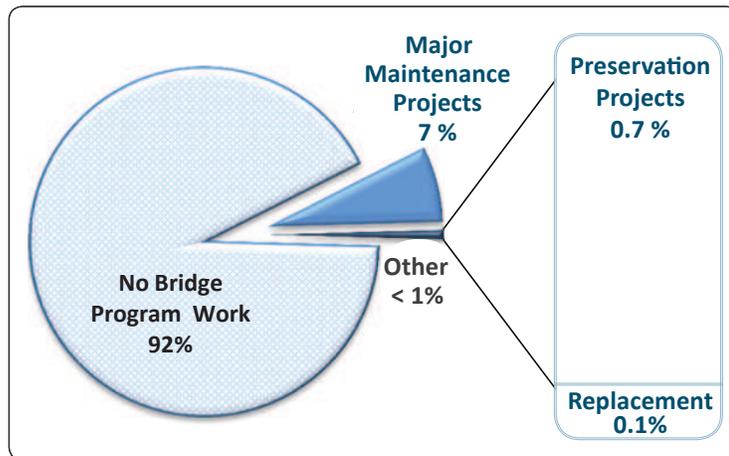


Figure 3. The average annual percentage of ODOT’s state bridge projects in the past three years.