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INSIGHT

Condition of Highway Bridges Continues to Improve

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A construction-industry group recently estimated that more than one-third of all U.S. highway bridges need major repairs or replacement, construction work that could cost federal, state, and local governments about $164 billion. When compared to total bridge capital spending of about $17 billion per year, of which roughly $7 billion is federal support, some might consider this bridge investment "backlog" to be a significant budgetary challenge. Others say the situation is probably not as dire as this analysis suggests. The data used in that estimate, published every year by the Federal Highway Administration (FHWA), continue to show that the number and share of bridges in poor condition have dropped significantly over the past 20 years. Furthermore, repairing every deficient bridge in just a few years is unrealistic, and not every bridge repair is likely to be justified when considering both the economic benefits and costs. FHWA's own analysis of bridge data suggests a relatively modest increase in spending could substantially reduce or eliminate the backlog of economically justifiable investments if sustained over a 20-year period.

Bridge Conditions

Federal law requires states to inspect public road bridges periodically and to report their findings to FHWA. This information permits FHWA to characterize the existing condition of bridges as good, fair, or poor. A bridge is considered in good condition if the deck, superstructure, and substructure are rated at least 7 on a 0-to-9 scale. If any of these bridge elements is rated 5 or 6, a bridge is considered in fair condition. A bridge is considered in poor condition if any element is rated 4 or less.

At the end of 2019, according to FHWA, of the 617,000 bridges in the United States about 46,000 were in poor condition. This represented about 7.5% of all bridges. About 291,000 (47%) were classified as fair and 280,000 were classified as good (45%).

The number and share of bridges considered in poor condition have been cut in half over the past 20 years, although this conclusion is complicated by a methodological change in the way bridges are

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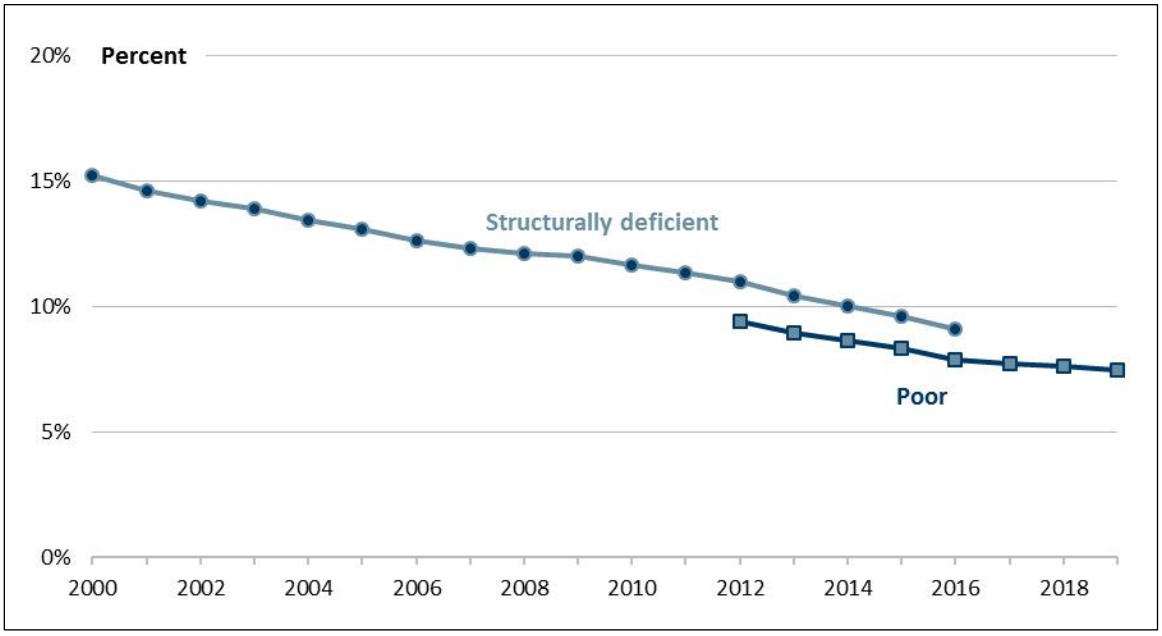
classified. Prior to the change, FHWA used the term "structurally deficient," which included bridges in poor condition and some others, such as those with an inadequate waterway opening. Fewer bridges, therefore, are rated poor than structurally deficient (**Figure 1**). The difference between structurally deficient and poor bridges was about 7,500 bridges in 2016, 1.2% of the total bridge count. Both urban and rural bridges have improved since 2000, but a greater share of rural bridges continues to be in poor condition (**Figure 2**).

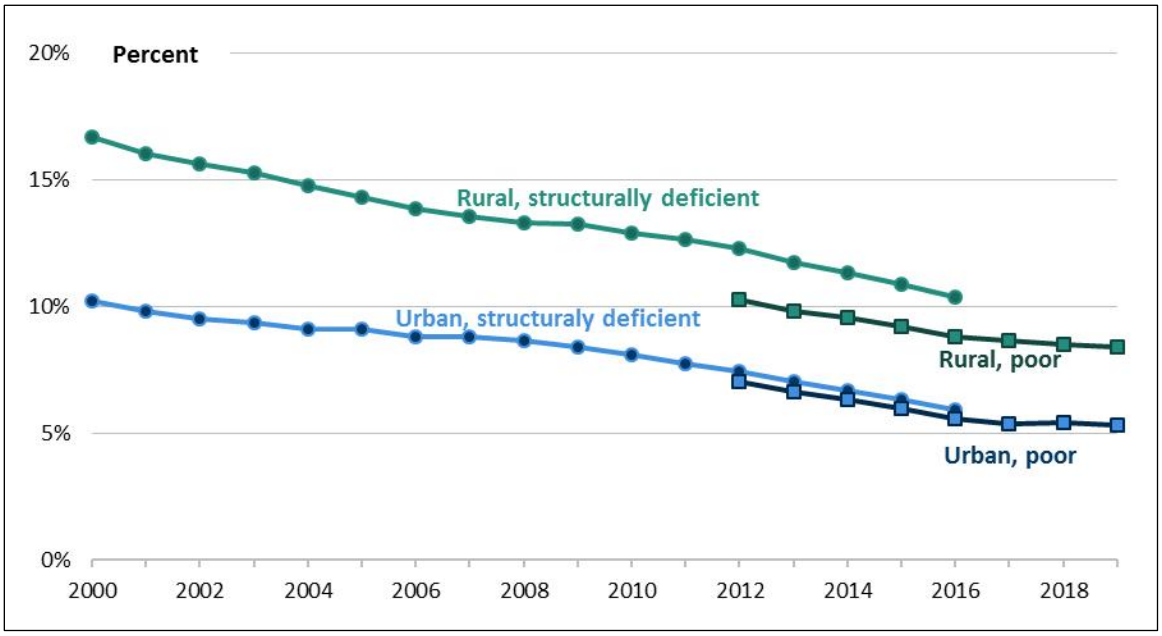
Figure 1. U.S. Highway Bridges in Poor Condition or Structurally Deficient, 2000 to 2019



Source: Federal Highway Administration, "National Bridge Inventory," at https://www.fhwa.dot.gov/bridge/nbi.cfm.

Note: The definition of structurally deficient is the FHWA definition prior to the change implemented in January 2017.

Figure 2. Highway Bridges in Poor Condition or Structurally Deficient by Urban and Rural Location, 2000 to 2019



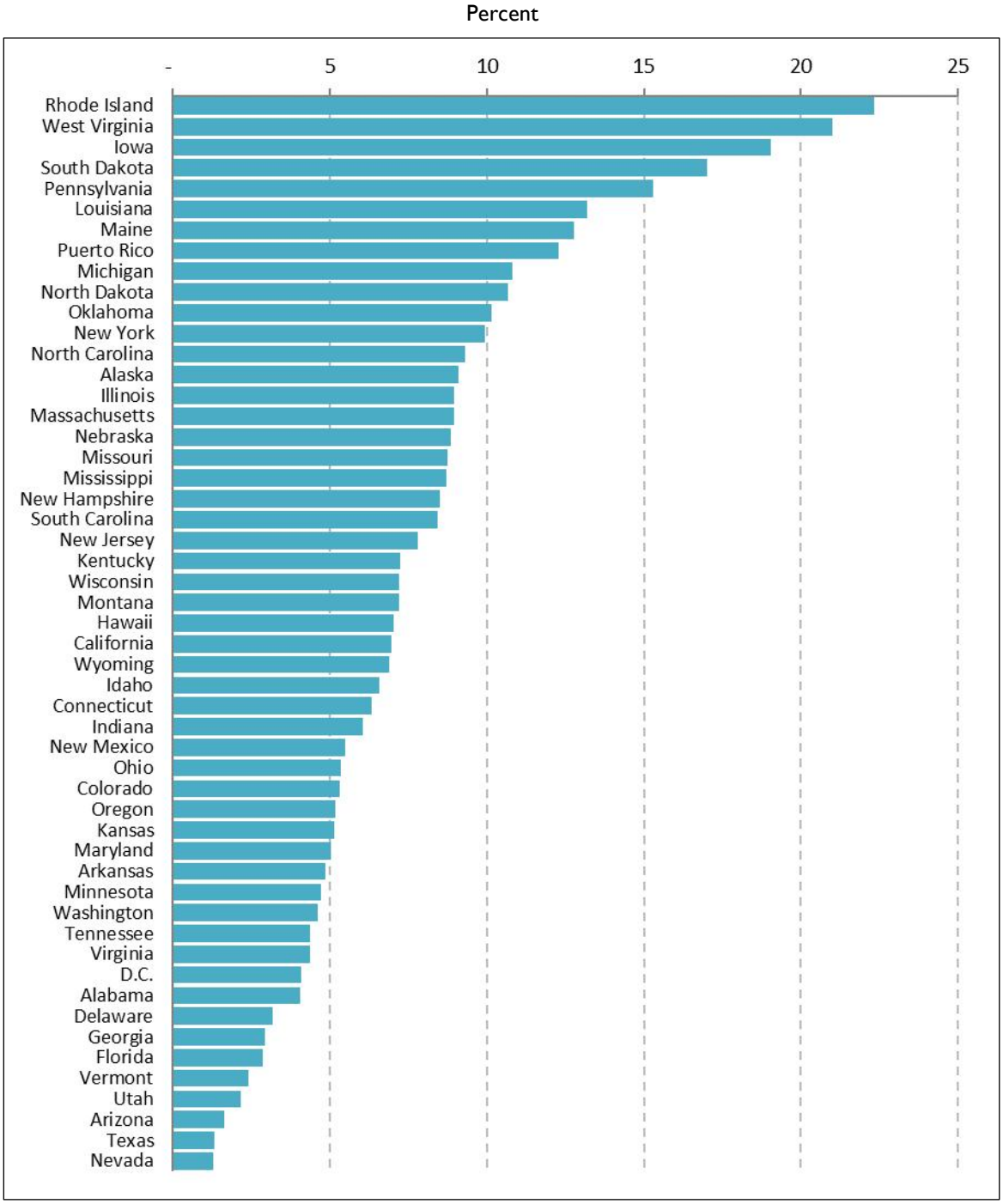
Source: Federal Highway Administration, "National Bridge Inventory," at https://www.fhwa.dot.gov/bridge/nbi.cfm.

Note: The definition of structurally deficient is the FHWA definition prior to the change implemented in January 2017.

Wide Variation Among the States

According to FHWA's data, the share of bridges in each state classified as poor varies widely. Almost a quarter of bridges in Rhode Island are classified as poor, whereas in Nevada the share is 1% (**Figure 3**). Some states have made substantial progress on improving the condition of their bridges. Between 2009 and 2019, for example, Pennsylvania reduced the share of bridges in poor condition from 27% to 15% and the share in Vermont declined from 13% to 2%.

Figure 3. Highway Bridges in Poor Condition by State, 2019



Source: Federal Highway Administration, "National Bridge Inventory," at https://www.fhwa.dot.gov/bridge/nbi.cfm.

Investment Needs

Every two years or so, FHWA assesses the condition and performance of the nation's highways and bridges, documents current spending by all levels of government, and estimates future spending needs. The most recent assessment was published in 2019 based on 2014 data. Represented in 2019 dollars, this

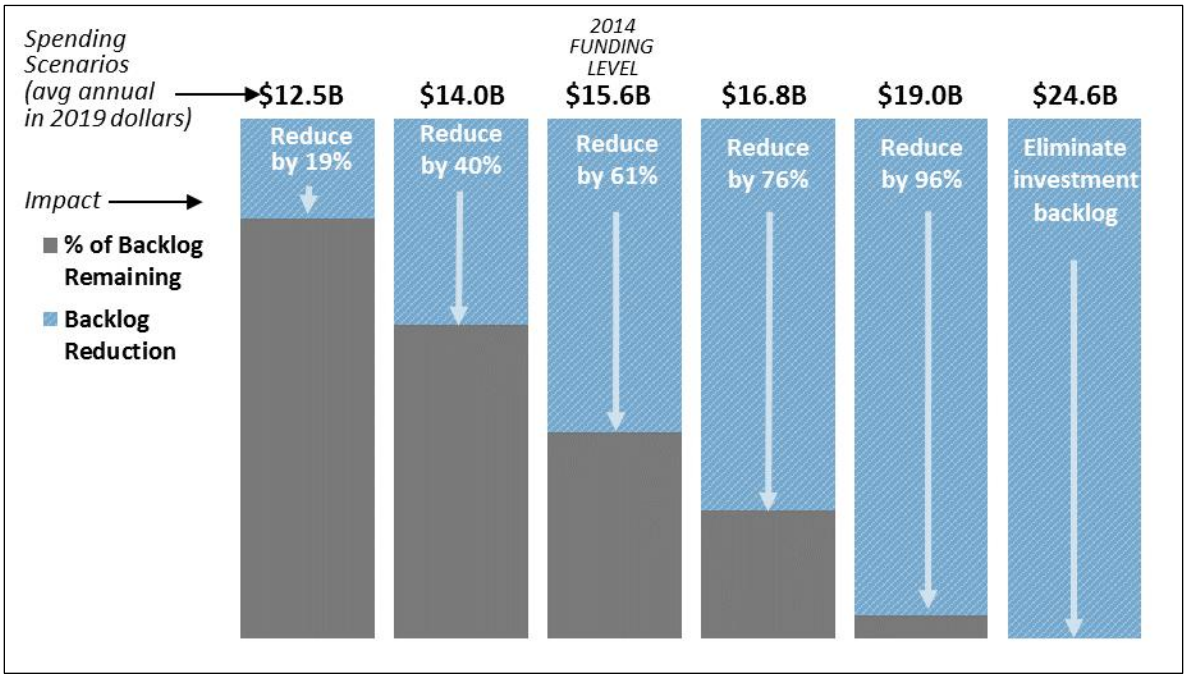
assessment showed that $15.6 billion was spent on bridge rehabilitation or replacement by governments at all levels in 2014. An additional $1.7 billion was spent on the construction of new bridges.

FHWA's needs estimates for bridges are limited to fixing deficiencies in existing bridges only when the benefits outweigh the costs. This could be one reason why FHWA's estimate of the bridge investment backlog was about $135 billion (in 2019 dollars), about $30 billion lower than the estimate based on fixing all deficiencies.

Fixing all bridge deficiencies over a short period of time is not feasible given limits in skilled labor and equipment, even during a recession. FHWA, therefore, estimated how this investment backlog might change at various levels of spending over a future 20-year period, taking into account the deterioration of existing bridges over that period. The results of this analysis are seen in **Figure 4**. FHWA estimated that eliminating the backlog in 20 years would require an investment of $24.6 billion annually (in 2019 dollars), which would represent about a 58% increase in spending. A 96% backlog reduction could be achieved with an investment of $19 billion a year, a 22% increase. Funding for the construction of new bridges is not included in these estimates.

Figure 4. Estimated Effect of Various Spending Levels on Bridge Investment Backlog

Average Annual Spending for 20 Years



Source: Federal Highway Administration and Federal Transit Administration, *Status of the Nation's Highways, Bridges, and Transit: Conditions and Performance, 23rd Edition*, January 2019, exhibit 10-15.

Notes: The current funding level is for 2014 and the 20-year spending scenarios are for 2015 through 2034. CRS adjusted the data expressed in 2014 dollars to 2019 dollars using the implicit GDP deflator.