

BRIDGES

2010 Report Card for Pennsylvania's Infrastructure

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Of Pennsylvania's 22,280 bridges, 27% are considered structurally deficient and 17% are deemed functionally obsolete. These figures mean increased traffic congestion as well as forcing emergency vehicles to take lengthy detours due to speed or weight restrictions. PennDOT's emphasis on bridges through their accelerated bridge program has allowed these numbers to hold steady despite the advancing age of the Commonwealth's bridge inventory. Further emphasis on the bridge program and proper funding of bridge replacement and rehabilitation will help push trends in a positive direction. However, the recently rejected 1-80 tolling proposal means the Pennsylvania legislature is now faced with the task of coming up with new sources of funding to cover a transportation funding gap of \$1.7 – \$2.4 billion per year, including \$11 billion in immediately needed bridge repairs.

BACKGROUND

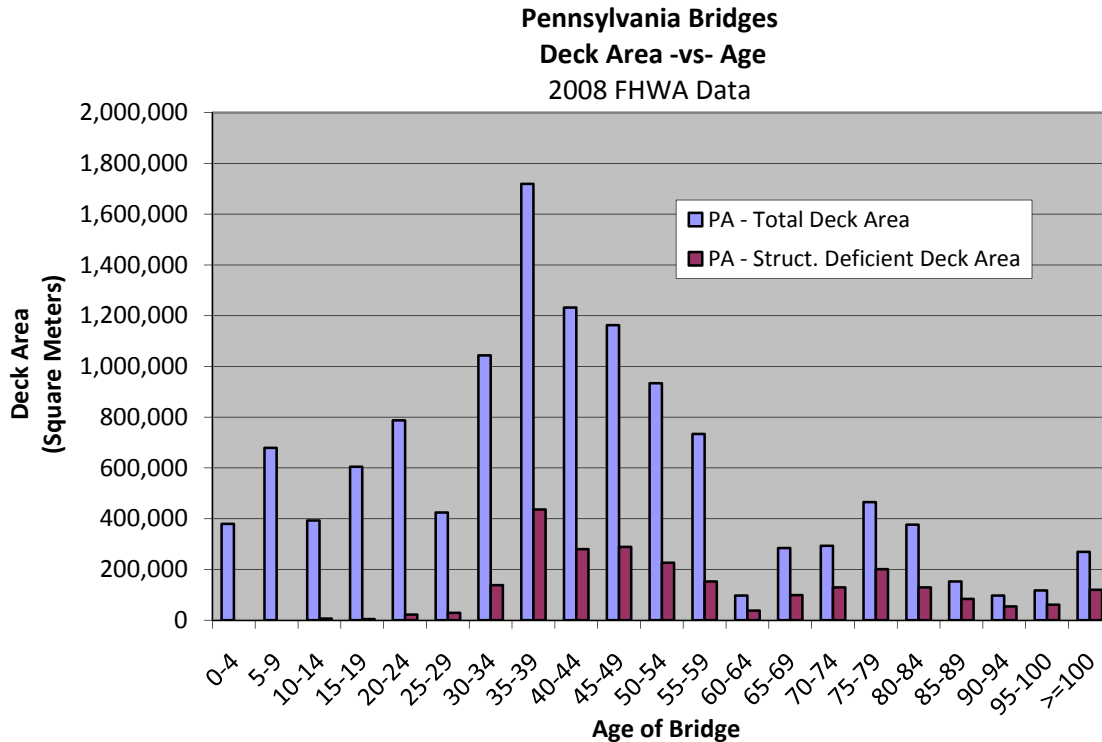
Bridges in Pennsylvania are inspected on a regular basis and given numeric ratings based on their condition. Current statistics show that 27 percent of Pennsylvania's bridges are structurally deficient, while 17 percent of the state's bridges are functionally obsolete. In terms of bridge deck surface area, 20 percent is considered structurally deficient and 23 percent is deemed "functionally obsolete." A structurally deficient bridge has at least one deteriorating structural component. While not necessarily unsafe, these bridges may have limits for speed and weight. A functionally obsolete bridge has older design features and, while not unsafe for all vehicles, it may not adequately accommodate current traffic volumes, vehicle sizes and weights. Without proper funding to maintain the commonwealth's recent emphasis on bridge replacement and rehabilitation to correct structural deficiencies and bridge preservation, the inevitable increase in bridge age, traffic volumes and weights will continue to degrade the bridges more rapidly and cause the number of deficient bridges and deficient deck area to rise.

CONDITIONS

All bridges in Pennsylvania are inspected using consistent criteria. Determination of structural deficiency and/or functional obsolescence is uniform across the commonwealth and the United States. The potential resulting restrictions contribute to traffic congestion. They also pose inconveniences for school buses and emergency vehicles, which often are required to take lengthy detours. Based on August 2009 statistics from the Federal Highway Administration (FHWA) National Bridge Inventory, Pennsylvania has 22,280 bridges with a 20-foot or longer span located on public roads. Twenty-seven percent of these bridges are structurally deficient while 12 percent of bridges are structurally deficient nationally. Seventeen percent of the commonwealth's bridges are functionally obsolete while 13 percent of bridges are nationally.

These statistics indicate a significant discrepancy between the national averages and Pennsylvania's bridges; however, it is important to consider the following:

- Pennsylvania has more lane miles than most other states that suffer severe winters. Bridges are susceptible to cracking due to temperature and weather changes (freeze/thaw cycles) in the state. Also, the corrosion-inducing salt used during snowy/icy conditions decreases the life of a structure compared to southern states.
- Pennsylvania has some of the oldest and most heavily traveled highways and bridges in the nation. The average bridge age in Pennsylvania is more than 50 years old (see graph below).
- Historically known as the Keystone State, Pennsylvania is a key link in the nation's infrastructure—connecting people and commerce north-to-south and east-to-west.



Predicted increases in the number of trucks and axle loads on the roads will continue to degrade the roads more rapidly. Deterioration of the bridges is expected, but it can be monitored and controlled through properly funded preservation and maintenance activities. Proper funding and a continued focus on bridges, such as the Pennsylvania Department of Transportation's (PennDOT) Accelerated Bridge Program, is necessary to decrease the number of structurally deficient and functionally obsolete bridges in the state.

According to the ASCE 2006 *Report Card for Pennsylvania's Infrastructure*, 25 percent of the bridges in Pennsylvania were structurally deficient, 13 percent of bridges were structurally deficient nationally. Eighteen percent of the state's bridges were functionally obsolete while, 13 percent of bridges were nationally. Pennsylvania's numbers generally held steady in terms of structurally deficient bridges, with the current number increasing by 2 percent and the number of functionally obsolete bridges decreasing by 1 percent. Without PennDOT's recent bridge program emphasis, the numbers would be significantly worse due to advancing bridge age and increased bridge usage.

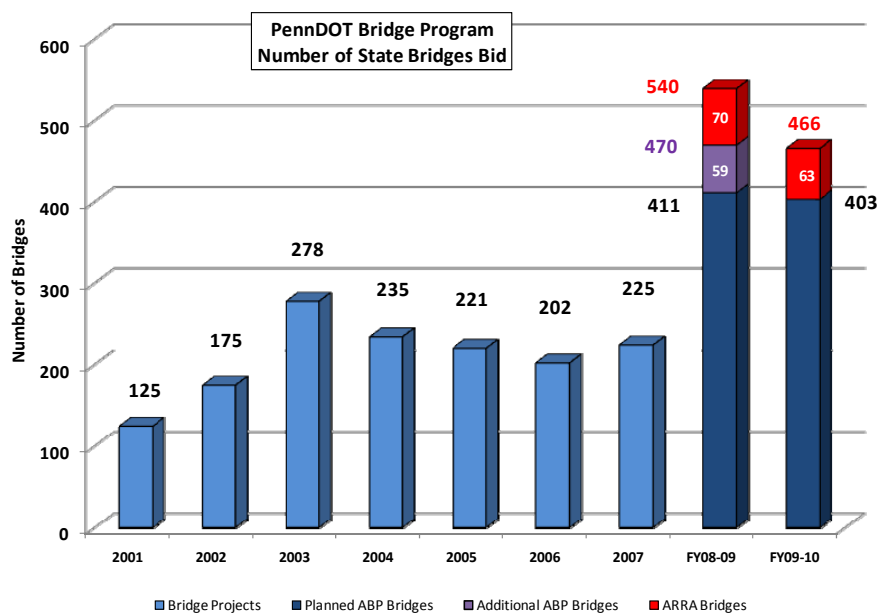
POLICY OPTIONS

Policy and funding developments since the 2006 Report Card for Pennsylvania's Infrastructure

As mentioned above, without the recent major emphasis on the commonwealth's bridges, the percentage of structurally deficient bridges would be much higher. Fortunately, PennDOT's Accelerated Bridge Program was instituted in 2008, which was a main factor in abating this issue.

Recognizing the structural deficiency issues affecting the commonwealth, PennDOT instituted the Accelerated Bridge Program to address the worsening conditions of its bridges. After analysis, coordination with FHWA and re-prioritization of funding, PennDOT developed a list of 1,145 structurally deficient bridges to be rehabilitated or replaced between 2008 and 2010. A combination of innovative bidding, design, preservation and construction techniques was, and continues to be, used. Further, PennDOT focused on the "right" bridges – based on a risk assessment methodology—that addressed the most immediate needs for Pennsylvania's traveling public. These needs were determined by evaluating issues such as traffic volumes, condition, safety and remaining life span. As shown in the graph below, due to this program, the number of bridge rehabilitations/replacements bid for construction has significantly increased.

Rebuild PA



Another positive development was the American Recovery and Reinvestment Act of 2009 (ARRA), which provided funding to bridges in the commonwealth. To date, Pennsylvania has been allotted more than \$1 billion for highway and bridge work. Roughly \$390 million of that amount has been dedicated to Pennsylvania's bridges.

Less positively, the most recent six-year federal surface transportation bill, SAFETEA-LU, expired in October 2009 and has yet to be reauthorized. Currently, the federal government is working under continuing resolutions which provide roughly 30 percent less funding and no recognition of changing conditions in the transportation infrastructure climate, not even construction cost inflation.

Finally and most critically, Act 44 passed the Pennsylvania legislature in July 2007, establishing a long-term funding stream to help address Pennsylvania's transportation funding crisis. Based on traffic and revenue forecasts, Act 44 would have provided minimum payments to PennDOT from the Pennsylvania Turnpike Commission of \$83.3 billion over a 50-year period for transportation maintenance and improvements in Pennsylvania by converting I-80 to a tolled facility.

However, as of April 6, 2010, the federal government rejected Pennsylvania's application to convert I-80 to a toll road, leaving a funding gap of more than \$450 billion in the transportation budget. While other provisions of Act 44 have provided more than \$2 billion in transportation funding, revenues will drop sharply as of July 2010. The Pennsylvania Legislature is now faced with the task of coming up with new sources of funding to cover the critically underfunded transportation needs of the state, including \$11 billion in immediately needed bridge repairs.

Current Policy Issues

The key to a successful infrastructure program is to have funds to support bridge construction, rehabilitation and emergency situations. These three key aspects make possible the goals of accessibility, structural integrity and safety that are needed for Pennsylvania's bridges. However, the state of proper future funding for these issues is perilous at best.

- The recently enacted 2009-2010 Pennsylvania budget reduced transportation spending 6 percent from the 2008-2009 budget;
- Without the I-80 tolling portion of the Pennsylvania Act 44 funding stream, the number of structurally deficient bridges will increase;
- Reauthorization of the expired federal transportation bill is lagging in the U.S. Congress; and
- Continued solvency of the federal Highway Trust Fund is tenuous under the current motor fuels user fee level.

However, there are some bright spots in the efforts to improve Pennsylvania's bridges.

- PennDOT's continued emphasis the accelerated bridge program;
- The eventual federal surface transportation authorization will most likely contain significantly higher funding allocations.

RECOMMENDATIONS

Specific recommendations supported by the Pennsylvania sections of the American Society of Civil Engineers

- Set a state goal to reach the national average of structurally deficient deck area percentage for state bridges by 2033;
- Encourage PennDOT to continue the successful Accelerated Bridge Program;
- Continue to increase dedicated funds for bridge replacement, rehabilitation and preservation;
- Advocate the need for a reauthorized federal surface transportation program;
- Advocate for increased funding for bridge projects by the commonwealth;
- Encourage the use of life-cycle cost analysis principles to evaluate the total cost of projects;
- Encourage the use of cost-benefit analysis principles in evaluating projects;
- Continue to use PennDOT's *Smart Transportation* principles in bridge design to efficiently meet the commonwealth's transportation needs;
- Support environmental streamlining of transportation projects;
- Develop and implement creative financing and project delivery strategies for high priority projects (such as public-private partnerships and design/build); and
- Advocate for additional research and development funding.

SOURCES

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- ASCE Policy Statement 208: [*Bridge Safety \(PS 208\)*](#)
- ASCE Policy Statement 382: [*Transportation Funding \(PS 382\)*](#)
- ASCE Policy Statement 400: [*Design-Build Procurement \(PS 400\)*](#)
- ASCE Policy Statement 404: [*Endorsement of Infrastructure Projects \(PS 404\)*](#)
- ASCE Policy Statement 434: [*Transportation Trust Funds \(PS 434\)*](#)
- ASCE Policy Statement 451: [*Life Cycle Cost Analysis \(PS 451\)*](#)
- ASCE Policy Statement 496: [*Innovative Financing for Transportation Projects \(PS 496\)*](#)
- ASCE Policy Statement 497: [*Surface Transportation Research Funding \(PS 497\)*](#)
- ASCE Policy Statement 526: [*Public-Private Partnerships \(PS 526\)*](#)