Report Card for Pennsylvania's Infrastructure

GRADE SUMMARIES

Bridges



important concern regarding bridges is the safety of the public, a bridge closure or weight restriction will do more than just create local traffic delays. It can impact both local and regional traffic, and the economy of the region. The Commonwealth's bridges are in dire need of additional long-term funding. In November 2013, the Pennsylvania

legislature passed Transportation Funding Bill Act 89, an unprecedented transportation funding package that will bring much needed investment to the Commonwealth's transportation system. Unfortunately, even with the additional funding fully in place, it is estimated that more than 50 percent of the needs for state bridges and more than 60 percent of the funding needs for local bridges will still not be met in 2019

Dams



Pennsylvania has a total of 3.347 stateregulated dams, including 776 high hazard potential dams (23 percent): 289 significant

hazard potential dams; and 2,282 low hazard potential dams. High hazard potential dams are those whose failure would cause probable loss of human life and substantial property damage. Of the 776 high hazard potential dams in Pennsylvania, 518 (67 percent) are considered "deficient." A deficient dam is defined as any dam with a structural or hydraulic deficiency capable of causing the sudden uncontrollable release of reservoir

water by partial or complete failure of the dam or any of its features. The estimated cost to repair all Pennsylvania dams projected to be found deficient over the next five years is more than \$1.4 billion. Because of the Dam Safety Program, established in the late 1970s. Pennsylvania has remained ahead of most states in dam safety. For Pennsylvania dams, a grade of C- reflects the positive benefits of Pennsylvania's Dam Safety Program, balanced against the high number of dams in need of repair, the \$1.4 billion needed for repair and rehabilitation of deficient high hazard potential dams, and the significant threat a dam failure would pose to public health, safety, property, the environment, and to local, county and state economies.



Drinking Water

Drinking water infrastructure in Pennsylvania faces a required investment of \$13.9 billion over the next 20 years to replace aging facilities and comply with safe drinking water regulations. Although waterborne outbreaks are low, the number of incidents has been on the rise. It is encouraging that the number of drinking water systems in violation of clean water regulations has declined. Drink-

ing water facilities will require a steady source of funding.

Drinking water systems must adopt full-cost pricing in water billing to reflect operational and maintenance costs, as well as raising funds for eventual replacement. If funding needs are not met, the state risks reversing the public health, environmental, and economic gains that have been made over the past three decades.

Energy





in the country in terms of electrical generation. Pennsylvania is the number one exporter of electricity in the United States. The policy focus of increasing energy efficiency, reliability, and development of renewable energy resources, coupled with the recent expansion of natural gas resources from the Marcellus Shale regions, have had significant impact on the energy infrastructure of the Commonwealth. The infrastructure appears to be reasonably

well positioned to meet the state's current and 20-year planning horizon needs, although it is clear that energy and environmental policy will likely have a significant impact. In addition, given the power outages resulting from harsh winter of 2013-2014, the system's resilience needs to be addressed.



Freight Rail

Pennsylvania has 57 freight railroads covering 5127 miles across the state, ranking it the 4th largest rail network by mileage in the U.S. By 2035, 246 million tons of freight is expected to pass through the Commonwealth of

Pennsylvania, an increase of 22 percent over 2007 levels. Pennsylvania's railroad freight demand continues to exceed current infrastructure. Railroad traffic is steadily returning to near-World War II levels, before highways were built to facilitate widespread movement of goods by truck. Rail projects that could be undertaken to address the Common-

wealth's infrastructure needs total more than \$280 million. Annual state-of-good-repair track and bridge expenditures for all railroad classes within the Commonwealth are projected to be approximately \$560 million. Class I railroads, the largest railroad companies, are poised to cover their own financial needs; however, some smaller railroads need assistance to continue service to rural areas of the state



Levees

Pennsylvania has historically been one of the most flood-prone states in the nation, having experienced billions of dollars in flood damages since the 1930s. Over the last 100 years, 4,523 deaths have been attributed to levee failures nationwide. Levee systems are aging and deteriorating over time, with many of the systems approaching their anticipated lifespan, and many have exceeded their anticipated lifespan. The advanced age of the state's levee systems casts doubt on their ability to perform without incident or failure

in an extreme flood event. The potential for the increasing frequency of flooding due to climate change results in an overall increase in the risk of flooding due to levee overtopping or failure. The grade of C- is a balance of, on the one hand, the benefit of the Commonwealth effectively operating one of the few state-level comprehensive flood protection programs in the nation, and, on the other hand, the advanced age of the levee systems, the population at risk, the ongoing struggle to obtain funds for the repair and maintenance, and the often under-appreciated threat to public safety resulting from catastrophic levee failure.

Schools



Current information on the infrastructure of our public and charter schools is not available. Act 59 of 2013 required the Pennsylvania Department of Education to conduct a statewide analysis of school facilities and future capital needs. The information collected will be publicly available and included in a preliminary report due to be submitted

to the General Assembly in 2014. The Commonwealth has had a moratorium on approving new school construction projects since 2011. Progress on addressing the findings of the pending report through streamlining of the PlanCon

process and providing adequate, predictable, and sustainable state funding for the repair, renovation and construction of school buildings is critical for school districts and charter schools to address their facility needs.

Inland Waterways



Pennsylvania's inland waterway infrastructure, which connects the Commonwealth to the national waterway systems, was built over the last 150 years. Many of its locks and dams are in a severe state of disrepair due to lack of maintenance and capital improvements funding over sev-

eral decades. The grade of D+ reflects the fact that none of Pennsylvania's navigation dams and only 18 percent of the locks have a "satisfactory" condition assessment rating, and shipping delays at the most degraded facilities are frequent. This negatively impacts our economy. While American

Recovery and Reinvestment Act (ARRA) funding provided a much needed boost to construction and operations and maintenance budgets, the ongoing and significant Federal funding limitations have greatly delayed completion of major rebuild projects. A catastrophic failure within the inland waterway system, like any major infrastructure failure, would have serious effects on the industries that rely directly on river transport of heavy bulk commodities.

RESIDUOS PELIGROSOS

Hazardous Waste

Over the last ten years, Pennsylvania has made steady progress in reducing the amount of hazardous waste generated, in cleaning up and redeveloping sites that are con-

taminated with hazardous waste, and in addressing other potential environmental impacts such as storage tanks, abandoned mines, and oil and gas drilling and production practices. However, more progress is needed to further reduce the environmental impacts of hazardous waste in the Commonwealth. From 2001 to 2011, the amount of hazardous waste generated annually in the Commonwealth

has decreased by 23 percent. Pennsylvania's waste-related environmental challenges extend beyond the boundaries of the Resource Conservation and Recovery Act (RCRA) Subtitle C definition of hazardous waste and include wastes associated with recent oil and gas drilling and production activities, historic coal mining, and the management of coal combustion residuals

Parks & Recreation

Despite the downturn of the economy over the past six years, and a significant reduction in Federal and state funding for the past few years, the Department of Conservation and

Natural Resources (DCNR) has succeeded in expanding its source of income, as well as managing its programs and facilities expertly, to further increase the appeal and reputation of state parks, forests, and recreational areas and continue Pennsylvania's tradition as a leader in this category. Moreover, the royalties that have been collected by DCNR from Marcellus shale gas operations have introduced a new

Ports



Nearly one-third of America's Gross Domestic Product (GDP) is derived from international trade, and 99 percent of that trade passes through the nation's ports. Thirty million

jobs are related to international trade, and \$200 billion in Federal, state, and local tax revenue is generated by our ports each year. The ports on the Delaware and Schuylkill Rivers handled 87 million tons of cargo in 2011 (the most recent available data), comprising 26.3 percent of the North Atlantic ports' market share. Most of the gasoline

Pennsylvanians put in their cars, the food they eat, and the clothes they wear passed through the port facilities on the Delaware River. The grade of C+ reflects the fact that, although the responsible authorities have maintained the necessary depth of most river channels, there is not a stable funding stream for their continued maintenance or for the completion of the deepening of the Delaware River channel from 40 to 45 feet, nor are there sufficient disposal areas for dredged material for some channels. If there is insufficient funding to complete the deepening project, by its scheduled 2017 completion date, the ability of the ports on the Delaware River to take advantage of the Panama Canal expansion will adversely impact their competitiveness with other eastern ports for oceangoing cargo.

Solid Waste



by private haulers and disposed at private facilities, with oversight provided by municipal and county staff. In 2012, solid waste collection services were adequate in all but the most rural areas, and disposal capacity was adequate for anticipated future needs. Recycling, which accounted for a large percentage of waste diversion, can be subdivided into two major aspects: collection and processing. On the collection side, recycling faced challenges given recent de-

creases in state funding and recycled commodity value, as well as recent court rulings, which have adversely affected the ability of local governments to fund programs. While recycling commodity processing was well established in urban areas, many rural areas struggled with limited access to adequate processing facilities.





Stormwater

Over the last several years economic turmoil brought residential and commercial development to a halt. This is significant because most stormwater management infrastructure



is installed in new developments. At the same time, more frequent large storms, flooding, and episodes of drought due to climate change are putting pressure on existing stormwater management infrastructure. Several new pieces of stormwater legislation were enacted in the last three years; however, no funding has been available for implementing those rules. The current and anticipated needs

for stormwater infrastructure are too large for individual municipalities to fund. Whether Pennsylvania municipalities and the state will come together to address the problems caused by stormwater remains to be seen.





Transit

In recent years, transit use has increased faster than any other mode of transportation. Use of Commonwealth-supported public transportation increased by more than 33 percent since 1995. Public transportation providers are located in every county in the state. Public transportation

helps the environment by reducing the number of cars on the road, saving millions of gallons of gasoline each year and reducing both the pollutants that cause smog and climate change and the need for increasing land development for road use. Act 89 of 2013 provides much needed

funding stability for transit systems across the state to operate, improve service, and replace aging equipment with more efficient models. Maintaining the positive direction this new funding provides requires Congress to reauthorize MAP-21 (Moving Ahead for Progress in the 21st Century Act: P.L. 112-141) expeditiously in 2014. To increase capital expansion, local funding sources should be utilized.



Wastewater

Aging wastewater management systems discharge billions of gallons of untreated sewage into Pennsylvania's surface waters each year. In fact, Pennsylvania has the

greatest number of combined sewer overflows (CSOs) of any state. The Commonwealth must invest \$28 billion over the next 20 years to repair existing systems, meet clean water standards, and build or expand existing systems to meet increasing demands. The Pennsylvania Infrastructure Investment Authority's (PENNVEST) budget in 2013 for grant and loan awards for sewer projects is \$335 million, less than 25 percent of the required annual investment. In 2013, Pennsylvania's ap-

propriation from the Federal Clean Water Act also decreased to \$53 million.



Roads

Pennsylvania's 8.8 million drivers travel nearly 100 billion miles on these roads every year. Truck traffic on Pennsylvania's current 1,855 miles of interstate roads averages over 34 percent, more than double the national average. The

Pennsylvania Department of Transportation (PennDOT) rated 44 percent of Pennsylvania's roads fair or poor in 2012. If this trend continues, over half of Pennsylvania roadways will be rated fair or poor by 2015. Without construction of new roadways and lanes to increase capacity, Pennsylvanians will continue to sit in traffic.

Traffic congestion costs the average commuter 182 hours of delay and 86 gallons of fuel wasted every year in major urban areas. That's over 4 weeks of vacation time and a month's worth of fuel for a vehicle with average gas mileage! Statewide congestion is estimated to cost drivers over \$3.7 billion per year in lost time and wasted fuel. Maintaining Pennsylvania's huge existing roadway system is a constant challenge. Although the recently signed Transportation Bill was an unprecedented, comprehensive package that will bring much-needed additional investment to the Commonwealth's transportation system, it is estimated that roadway needs will still not be met in 2019. Simply keeping the road system from degrading, let alone improving it, requires more funding than is currently available



By tackling our infrastructure's needs now,

we can start Building Bridges to the Future.

Contact us at reportcard@asce.org





Pennsylvania's Infrastructure Matters

Most of us take infrastructure for granted in our daily lives—whether it's an easy commute across roads and bridges, clean drinking water and streams, or reliable energy to power our electronics. Infrastructure also moves our economy, taking goods from ports to roads to store shelves and moves workers from their homes to their workplace. In fact, Pennsylvania's roads carry 34% more goods across the Commonwealth than the average state, making it critical that roads and bridges are able to handle the loads and keep us moving.

About Us

Founded in 1852, the American Society of Civil Engineers (ASCE) represents more than 145,000 civil engineers worldwide and is America's oldest national engineering society. ASCE has four Pennsylvania Sections representing over 5,000 civil engineers who supported the development of this Report Card. By developing leadership, advancing technology, promoting the value of civil engineering, and advocating lifelong learning, ASCE enables its member, partners, and the public to improve our infrastructure and build a better quality of life.

w.asce-pa.org

w.lvasce.org

.asce-pgh.org

sce-philly.org

ww.asce.org

Central Pennsylvania:	ww
Lehigh Valley:	w
Pittsburgh:	www
Philadelphia:	www.a
ASCE National:	

While we may not think about infrastructure every day, Pennsylvania's civil engineers do because they've pledged to build it, maintain it, and keep the public safe. Every few years, Pennsylvania Sections of the American Society of Civil Engineers (ASCE) provide a *Report Card on Pennsylvania's Infrastructure* so that each citizen and decision maker can understand how Pennsylvania's infrastructure is doing. This 2014 Report Card on Pennsylvania's Infrastructure gave the Commonwealth an overall grade of C-, as our state has some of the oldest infrastructure systems in the country. Our leaders have taken big steps forward to address the immediate and long-term infrastructure needs of the Commonwealth, but the work to improve our aging infrastructure is just beginning. From water to roads to waterways, our infrastructure grades show that we must prioritize strategic assets and

The Report Card provides three recommendations to move Pennsylvania forward:

build infrastructure that protects our economic

prosperity and our citizens.

- Keep up the momentum for better infrastructure: In 2013, Pennsylvania's officials showed leadership by passing a transportation package that will start putting our roads, bridges, and transit back into working order. Just like mom and dad planning for retirement, we also need to make sure there's a plan for aging infrastructure.
- 2. Affirm public safety as government's #1 job: Whether it's repairs to bridges or keeping up on dam safety inspections, public safety must always be the first priority as our leaders budget and plan for the future. Ensuring our infrastructure is resilient and online 99% of the time will keep our communities safe and our economy thriving.
- **3. Stop wasting money by waiting:** Of the 7 infrastructure categories with D grades, all deal with transportation and water systems, and

much of the repairs and long-term funding are being short-changed. Waiting will only lead to larger issues that will disrupt our lives and cost even more when the bill comes due. We must look at the full cost of our decisions and put our savings to use.

Behind the Grades

Over 55 experts from the four Pennsylvania Sections of the American Society of Civil Engineers (ASCE) evaluated 16 infrastructure categories: bridges, dams, drinking water, energy, freight rail, hazardous waste, inland waterways, levees, parks and recreation, ports, roads, schools, solid waste, stormwater, transit, and wastewater. The experts gathered background information for each of the categories—including reports, studies, surveys and other research materials—from professional societies, non-profit associations, and local, state, and Federal agencies. The grades were developed in the simple A to F school report card format, assigning letter grades that are based on the physical condition and needed fiscal investment for improvement. Grades were developed considering each of the following eight criteria: capacity, condition, funding, future need, operation and maintenance, public safety, resilience, and innovation. As engineers, we are committed to improving the Commonwealth's infrastructure.

The grades were developed with current conditions in mind. The grades are an evaluation of the current state of the physical infrastructure itself and not a reflection on the agencies responsible for the infrastructure, who are often working with limited resources. Each category also puts forth recommendations for how to raise the grades.

A major transportation funding bill (Act 89) was passed by the Pennsylvania Legislature and signed by the Governor in November 2013. We look forward to improvements in the grades for the transportation categories in the 2018 Report Card for Pennsylvania's Infrastructure as a result of this new funding source. Despite the transportation funding, there will still be a gap in investment to maintain a "state of good repair" in the Commonwealth. There also needs to be additional focus on the other infrastructure categories, especially drinking water, inland waterways, stormwater, and wastewater.

Grades were assigned		
to each category based on		
the eight criteria.		
The grades break down		
as follows:		
Α	90–100%	Exceptional
В	80–89%	Good
С	70–79%	Mediocre
D	51–69%	Poor
F	50% or lower	Deteriorating

You can access the Pennsylvania Report Card grades, read the full report for each category, see the list of contributors and their professional backgrounds, and access the sources used for the analysis at <u>www.pareportcard.org</u>. m

 201_4



WWW.PAREPORTCARD.ORG



REPORT CARD_{FOR} PENNSYLVANIA'S INFRASTRUCTURE