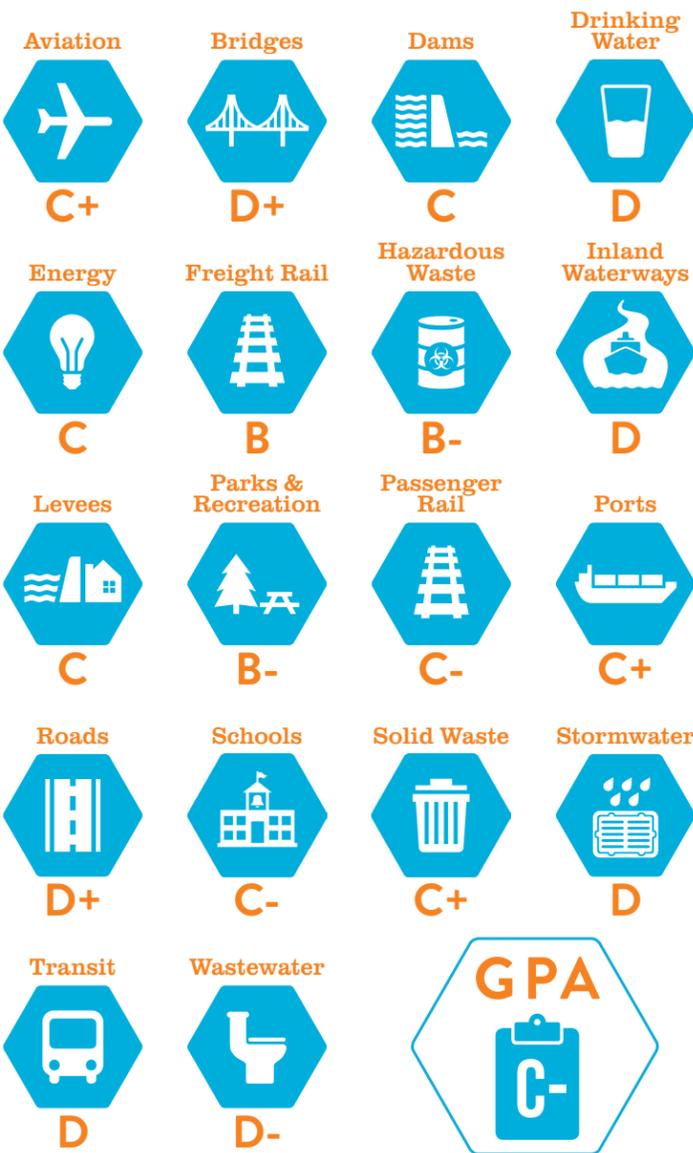


# PENNSYLVANIA GRADES



## About the Grades

The 2018 Report Card for Pennsylvania's Infrastructure was written by a committee of more than 75 civil engineers across Pennsylvania who volunteered their time to collect and analyze data, prepare and review their findings and present their conclusions. The committee worked with staff from ASCE National and ASCE's Committee on America's Infrastructure to provide a snapshot of our state's infrastructure, as it relates to us locally and on a national level. The Report Card Sections are graded based on the following eight criteria: capacity, condition, funding, future need, operation and maintenance, public safety, resilience and innovation. ASCE defines these grades as follows:



# SOLUTIONS TO RAISE THE GRADE

As Pennsylvania seeks to continue improving our infrastructure, ASCE in Pennsylvania offers some suggestions to raise the grade:

- 1 CONTINUING THE INVESTMENT IN TRANSPORTATION**  
Act 89 (signed in 2013) provided meaningful funding for multiple modes of transportation infrastructure. However, our needs are enormous and a one-size-fits-all approach to providing funding does not work anymore. ASCE encourages the Commonwealth to expand upon the Act 89 provision empowering revenue collection at the county level and to consider a regional basis for revenue collection.
- 2 FOCUS ON WATER**  
Drinking water, wastewater and stormwater grades were some of the lowest in the 2018 Report Card, yet are critical to protecting our public health and safety. Building, replacing and updating water infrastructure will require leadership to plan to tackle new developments and improve upon existing conditions. We should encourage and support the passage of legislation that allows localities to reflect the true cost of treating, delivering, and managing water in their user fees.
- 3 PREPARING FOR THE FUTURE**  
With a significant backlog of infrastructure needs, we need to push forward new ways to approach existing problems, such as public private partnerships (P3's) to pay for additional highway lanes or using connected and autonomous vehicles to increase capacity. Lawmakers should provide funding for research, development and deployment; engineers should continue to ensure the safety of the traveling public; and private industry should have a seat at the table as decision makers explore the ramifications of new technology.

## About ASCE-PENNSYLVANIA

The American Society of Civil Engineers (ASCE) is America's largest and oldest national engineering society. In Pennsylvania, ASCE has four active Sections: Central Pennsylvania, Lehigh Valley, Philadelphia and Pittsburgh, with nearly 6,000 members. By developing leadership, advancing technology, promoting the value of civil engineering, and advocating lifelong learning, ASCE enables its members, partners, and the public to improve our infrastructure and build a better quality of life.



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# REPORT CARD FOR PENNSYLVANIA'S INFRASTRUCTURE

2018

## 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 moving workers from their homes to their workplace. 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.

Today, much of Pennsylvania's infrastructure is old and outdated. Pennsylvania has some of the first infrastructure systems in the nation, and as a result, some of the oldest systems in the country. We're now faced with frequent water main breaks due to our old pipes, the greatest amount of combined sewer overflows in the nation and a lack of easily accessible information relating to our stormwater assets.

The 2018 ASCE Report Card for Pennsylvania's Infrastructure is a simple tool used to help residents, businesses, and policymakers understand the state of Pennsylvania's infrastructure. This information helps start the conversation about how to improve our infrastructure.

## How You Can Get Involved

- 1 Get the full story behind this Report Card at [www.pareportcard.org](http://www.pareportcard.org).**
- 2 Find out the condition of the infrastructure near you on the Save America's Infrastructure app available on the Apple App store and GooglePlay.**
- 3 Ask your elected leaders what they're doing to make sure your infrastructure is reliable for the future. Use your zip code to find your list of elected officials at [www.infrastructurereportcard.org/take-action](http://www.infrastructurereportcard.org/take-action).**



# 2018 PENNSYLVANIA'S INFRASTRUCTURE REPORT CARD

The 2018 Report Card for Pennsylvania's Infrastructure gave the state an overall GPA of C-. The good news is there are solutions to all of these challenges, and we can raise Pennsylvania's infrastructure grades. By learning more today about the conditions of the infrastructure you use every day, you too can help raise the grade.

## AVIATION

Airports in Pennsylvania are a critical element of the overall transportation network in the region. Generating over \$10 billion in annual payroll and over \$28 billion in output, aviation serves as a key economic generator, crucial to maintaining Pennsylvania's global competitiveness, and a safety and security asset for its citizens. With a good history of funding, Pennsylvania is developing a modern and safe aviation network, and multi-billion dollar investments are underway in Philadelphia and Pittsburgh that will benefit 90% of enplaned passengers in the state. Both challenges and opportunities remain, particularly with resiliency improvements, the need for consistent funding, and opportunities to develop both hangar and air cargo facility capacity to support growth and a changing economy.

## BRIDGES

Of Pennsylvania's more than 22,779 highway bridges – the ninth largest inventory in the nation – 18.3% (4,173 bridges) are classified as being in poor condition, down from 24.4% in 2014. On average, Pennsylvania's bridges are 15 years older than the national average and continue to be in need of repair and modernization. The additional funding from Act 89 passed in November 2013 has brought much needed investment to the transportation system, but more work needs to be done. While there have been many improvements over the past four years, Pennsylvania's bridge asset managers still face several challenges, and Pennsylvania has more than double the national average of bridges rated in "poor" condition.

## DAMS

There are 3,380 state-regulated dams in Pennsylvania that provide for the drinking water, irrigation, flood control, hydropower, recreation and industrial water needs of the state. While dams provide many needed services, if they are not properly invested in and maintained, they can pose a risk to life and property within the state. This is particularly true of high hazard potential dams; should these fail, there is probable loss of human life and substantial property damage. There are 803 high hazard potential dams in Pennsylvania, 743 of which are state-regulated. Of the state-regulated high hazard dams, 44% are considered deficient, a reduction from 67% in 2014. While this is encouraging, approximately 33% of the deficient dams are still considered unsafe, meaning they do not meet current Pennsylvania Department of Environmental Protection standards. Estimates show that \$1.1 billion is needed to repair deficient and unsafe dams in Pennsylvania.

## DRINKING WATER

Pennsylvania's drinking water infrastructure is aging. In Philadelphia, half of the city's water mains were installed prior to 1930 and nearly 30% were installed before 1900. Cast iron, which makes up a majority of Pennsylvania's water mains, saw break rates of nearly 35 per 100 miles per year, a 43% increase since 2012. Smaller community water systems, meanwhile, are struggling to fund projects to meet new regulations. Many public water system (PWS) billing rates have not kept up with rising costs. Over the next ten years, Pennsylvania's PWSs are projected to have a \$10.2 billion funding gap. To meet this gap, these systems will likely need to adopt full-cost pricing and find new technologies to reduce consumption and waste. Otherwise, the public could face increased health risks, environmental impacts, and financial losses.

## ENERGY

Pennsylvania benefits from having diverse, reliable and affordable energy resources, and utilizes those resources to rank third in the country in terms of total energy production. The state has a solid foundation of energy generation, transmission, and distribution infrastructure that is continuing to transform and react to market forces. However, Pennsylvania must also contend with increasing energy dependence and reliability requirements, aging infrastructure, and physical and cyber threats. While a portion of Pennsylvania's Electric Distribution Companies have been challenged with meeting reliability standards in recent years, the infrastructure appears to meet the current needs. It is clear that collaborative involvement among utilities, electric generation companies, regulators, and policymakers will be required to ensure investments and proposed projects address future system needs, such as renewables and evolving industry trends, while considering the impacts to affordability.

## FREIGHT RAIL

Pennsylvania's 64 freight railroads operate on 5,604 miles of track across the state, ranking it the fifth 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% over 2007 levels. Pennsylvania's railroad freight demand continues to exceed current infrastructure. Improvements such as double stacking or parallel tracks and larger transfer facilities would help improve capacity. The Pennsylvania Department of Transportation's Freight Rail Bureau has continued to procure impressive levels of freight infrastructure funding, which directly or indirectly supports multimodal transportation projects throughout the Commonwealth. This public funding is in addition to all private support committed. It has further produced the most comprehensive state rail plan to date, with a strong emphasis on understanding stakeholders and their needs.

## HAZARDOUS WASTE

Pennsylvania has made notable progress in reducing the amount of EPA-regulated hazardous waste generated and in cleaning up and redeveloping abandoned contaminated sites. From 2005 to 2015, the amount of hazardous waste generated in the Commonwealth annually decreased by 18.5%, for a total decrease of 26.1% since the inception of biennial reporting in 2001. Since 2014, the Commonwealth has been the benefactor of over 1,800 brownfield cleanup sites under the Act 2 Land Recycling Program. Funding for environmental protection within the Commonwealth remains an issue. Although available revenue has modestly increased since 2013, the PADEP general fund still remains approximately 40% lower than it was 15 years ago in 2003. Without action, the environmental values expressed in the Pennsylvania Constitution and the progress noted above will be jeopardized.

## INLAND WATERWAYS

The Port of Pittsburgh's Inland Waterways Navigation System consists of 17 locks and dams on the three major rivers that connect in Pittsburgh. Much of the infrastructure is 70 to 80 years old. Extended age and lack of consistent funding have allowed the condition of this system to deteriorate to the point that watercraft lockages have become severely impeded. Reduced hours of operation are in effect for several locks and dams along the Allegheny and Monongahela Rivers. While an increase in funding for the Olmstead project on the Ohio River is helpful, it has limited available funding for the remainder of the infrastructure. Meanwhile, inconsistent funding has caused project costs to increase from the original 1992 estimate of \$750 million to the current estimate of \$1.2 billion. Continued lack of sufficient funding could lead to a major lock and dam failure and loss of navigation for an extended period of time.

## LEVEES

With two new levee systems in Bloomsburg and Mt. Carmel constructed since 2014, and five new systems and seven rehabilitations currently under design, Pennsylvania is expanding and modernizing its levee infrastructure. Meanwhile, the US Army Corps of Engineers (USACE) substantially improved its online National Levee Database and over the past four years has expanded the National Levee Safety Program to include inspections of non-state, non-Federal levees and a hazard potential classification system. Yet, there is a growing need to rehabilitate aging levee systems, an often-underappreciated threat to flood-prone communities, and a need to re-evaluate levee designs based on outdated flood frequency statistics. In addition, municipalities that own and manage most levees often lack expertise needed to expedite needed rehabilitations. With the average age of levees in Pennsylvania approaching the typical design life of a levee system, further action is needed to keep Pennsylvanians safe from flooding.

## PARKS & RECREATION

Pennsylvania is home to more than 3.75 million acres of dedicated parks and recreational areas, including national trails and areas, recreational reservoirs and numerous county, municipal, and city parks. Overall capacity grew to accommodate the 44.5 million parks visitors in 2017 and the Commonwealth ranked fifth in the nation for how much users spend on outdoor recreation. However, national, state and local parks have significant needs. The Statewide Comprehensive Outdoor Recreation Plan 2014-2019 found state parks require \$783 million to bring the system back to a state of good repair. The Pennsylvania Department of Conservation and Natural Resources (DCNR) has embraced new funding methods, via the Marcellus Shale gas operation, and implemented long-range planning strategies such as the PA Outdoor Recreation Plan. While overall state-wide funding may be holding strong, fluctuating budgets put some municipalities in a difficult position when trying to keep up with their increased needs.

## PASSENGER RAIL

While safe to continue operations, much of Pennsylvania's passenger rail infrastructure is over 80 years old and is in need of on-going repairs and/or replacement. Passenger rail agencies have demonstrated commitment to safety with advancement of Positive Train Control (PTC) installation within the federally mandated deadlines, which will help prevent major accidents and save lives. When Act 89 was passed in 2013, passenger rail agencies were quick to respond with additional construction to rebuild the system and explore longer term efforts to increase capacity. The demand for passenger rail service continues to grow across Pennsylvania and should be studied further, particularly in the western part of the state, to maximize ridership opportunities. Continued funding is needed to improve existing infrastructure and provide expanded service throughout the state.

## PORTS

With over 100 million tons of goods moving through Pennsylvania's ports, Pennsylvania ranks ninth in the country for volume of goods that move through ports, providing an annual economic benefit of nearly \$50 billion to the Commonwealth. With substantial completion of the Delaware River Deepening scheduled in 2019, and \$300 million in major infrastructure capacity investments committed in 2016, the Commonwealth has demonstrated its commitment to be competitive in the global and regional economy. This momentum will need to continue to address deteriorating conditions as numerous facilities have aged past their useful life and are in need of significant infrastructure improvements in order to prevent Pennsylvania facilities from becoming obsolete, which will result in cargo finding another route into the country.

## ROADS

In 2013, Act 89 provided significant improvement funding increases, resulting in 2,600 projects that are currently in progress or have been completed. Although these funds have contributed to the advancement of reconstruction, rehabilitation, new roadway, and intersection improvement projects, there is a significant roadway backlog that still requires attention, as seen by 43% of PennDOT owned roadways having a fair or poor pavement surface. For motorists statewide, traffic congestion results in over \$3.7 billion per year in lost time and wasted fuel, and deficient roadway conditions cost the average motorist over \$500 in operating and maintenance outlays. In FY 2019, Act 89 funding will hit its maximum funding level and plateau. Thus, as Pennsylvania's roadway infrastructure ages, needs for increased capacity rise, and fuel economy increases, the funding gap will grow unless additional and alternative funding sources are identified.

## SCHOOLS

Statewide, we are spending \$500 million less than the recommended standard for public school facility operation and maintenance each year. Additionally, the school funding debt in Pennsylvania is double the national average and is the second highest in the country. Despite the funding gap, most schools are in good condition with some repairs needed and capacity is sufficient. However, reportedly half of Pennsylvania's schools do not have an asset management plan for their schools. Nevertheless, the Commonwealth remains a leader in the construction of energy efficient school facilities with over 100 LEED certified schools. More funding and focus on condition as well as on-going maintenance and operation of facilities is needed for school infrastructure to be considered fit for the future.

## SOLID WASTE

Pennsylvania's solid waste consists of household trash as well as waste generated by construction, commerce and industry. The solid waste infrastructure including haulers, landfills, and transfer stations remains in fair condition. Landfill capacity is sufficient and counties are required by law to plan for a minimum of 10 years' worth of disposal. Although Pennsylvania's daily per person solid waste disposal is over half a pound of trash less than our nation's average, the rate of disposal is on the rise. To counteract the increase, funding is needed to strengthen and grow municipal recycling universally across the Commonwealth. Safety issues and illegal dumping incidents serve as reminders that funding for the Pennsylvania Department of Environmental Protection is necessary to protect the public and support safe handling, transport, disposal, and recycling practices.

## STORMWATER

While generally performing adequately for higher-frequency lower-intensity rainfall events, the age of much of Pennsylvania's stormwater infrastructure exceeds 100-years, and needs on-going repairs, replacement, and capacity upgrades. There is also a lack of easily accessible critical information relating to the size, condition, capacity, and capital needs of all public and privately-owned stormwater assets. Sources of funding for these much-needed improvements are not consistently available for municipalities across the Commonwealth. The Pennsylvania Municipal Authorities Act was amended in 2013 by Act 68 to permit the creation of stormwater authorities, and Act 62 was signed into law in June 2016 authorizing second class townships to create stormwater utilities. Several other legislative bills are currently in the Pennsylvania Senate, and if enacted, will further empower local governments to apply a stormwater use-based revenue system to fund the operation, maintenance and upgrades of stormwater assets.

## TRANSIT

Each of the 67 counties in Pennsylvania has transit service available and the state boasts high transit usage in both cities and rural areas. In addition to the benefits of enhanced mobility, increased public safety, and environmental stewardship, the transit system's ability to carry more people in less space makes this mode an effective alternative to building new roadways. However, challenges exist. The Southeastern Pennsylvania Transportation Authority has identified \$5 billion for capital improvements to its light rail network alone. Smaller transit operators need to invest in vehicle replacement, storage and maintenance facility upgrades, and expanding the number of transit centers. Act 89 provided much-needed funding for transit infrastructure, which has helped authorities address some capital needs, but in the future more funding will be needed to maintain and expand capacity.

## WASTEWATER

Aging wastewater management systems discharge billions of gallons of raw sewage into Pennsylvania's surface waters each year. The average age of most sewer systems is approaching 70 years with many having pipes over 100 years old. 1.6 million homes in PA are served by on-lot systems with failure rates of nearly 20%. Half of the State's Sewage Facilities Plans are over 20 years old. It is estimated that the Commonwealth has a funding gap of \$8.4 billion over the next 10 years to repair existing systems, upgrade existing systems to meet regulatory requirements, control Combined Sewer Overflows, address illicit Sanitary Sewer Overflows, and construct new or expand existing systems to meet increasing demands. Available funding over that time is estimated to be \$900 million, approximately 10% of the required annual investment.