



2017 INFRASTRUCTURE REPORT CARD

Thank you for the opportunity to discuss an issue that increasingly dominates the news across the country, with serious consequences for our nation's economy: **America's infrastructure.**

The American Society of Civil Engineers is the nation's oldest engineering society and represents the 150,000 civil engineers who serve as stewards of infrastructure here in the U.S. and around the globe.

Every four years since 1998, ASCE has prepared a comprehensive assessment of the nation's 16 major infrastructure categories in its *Infrastructure Report Card*. Using a simple, familiar A to F school report card format, the Report Card examines current infrastructure conditions and needs, assigning grades and making recommendations to raise them. And how does ASCE determine these grades?

Nearly 30 civil engineers volunteer their time and expertise across the Report Card's 16 categories to serve on the ASCE Committee on America's Infrastructure. Working with ASCE staff, they review relevant reports and data, meet with technical and industry experts, and assess each category according to the following eight key criteria:

- *Capacity*
- *Condition*
- *Funding*
- *Future Need*
- *Operation and Maintenance*
- *Public Safety*
- *Resilience*
- *Innovation*

Upon determining the grades in the 16 categories, the grades are averaged just as on a school report card to determine an overall grade for the nation.

Needless to say, since ASCE's first Infrastructure Report Card, the grades have not been ones to make Lady Liberty proud; ASCE has yet to give an overall grade out of the Ds.

2017 Infrastructure Grades

 AVIATION	D	 PARKS AND RECREATION	↓ D+
 BRIDGES	C+	 PORTS	↑ C+
 DAMS	D	 RAIL	↑ B
 DRINKING WATER	D	 ROADS	D
 ENERGY	D+	 SCHOOLS	↑ D+
 HAZARDOUS WASTE	↑ D+	 SOLID WASTE	↓ C+
 INLAND WATERWAYS	↑ D	 TRANSIT	↓ D-
 LEVEES	↑ D	 WASTEWATER	↑ D+

America's
Cumulative
Infrastructure
Grade



A EXCEPTIONAL

B GOOD

C MEDIOCRE

D POOR

F FAILING

That remains true in the 2017 Infrastructure Report Card: America's cumulative GPA is once again a D+.

The cumulative grade of D+ reflects the significant backlog of needs facing our nation's infrastructure writ large, particularly in the three categories that experience a **decline** in grade this year: Parks, Solid Waste, and especially Transit, the Report Card's lowest grade at a D-.

Six categories' grades remain **unchanged** from 2013: Aviation, Bridges, Dams, Drinking Water, Energy, and Roads, with all but Bridges stalled in the D's.

Yet there are signs of progress – seven categories saw **slight improvements**: Hazardous Waste, Inland Waterways, Levees, Ports, Rail, Schools, and Wastewater.

Where we see areas of infrastructure that improved, those benefited from:

- Strong leadership
- Thoughtful policymaking
- Investments that garnered results.

These improvements demonstrate what can be accomplished when innovative solutions that move projects forward are implemented.

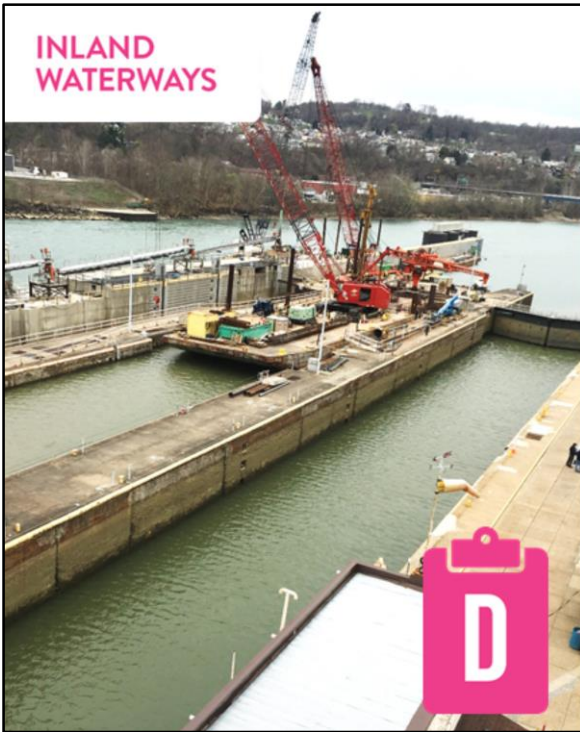
A quick look at the highest and lowest grades:

Rail is the highest grade, rising to a B from a C+.

- The private freight rail industry owns the majority of the nation's rail infrastructure, and has made significant investment in recent years to meet current and future needs and accommodate changing cargo trends, including investment \$27 billion in 2015 alone. This investment has led to the significant jump in grade.
- However, U.S. rail still faces clear challenges, particularly on the passenger rail side, including addressing increasingly congested corridors, meeting safety technology demands, replacing 100-year old bridges, and improving rail interconnections with other aspects of the freight network for a more efficient system.

Transit received the lowest grade of a D-, a drop from a D in 2013.

- Transit in America is hitting ridership records –10.75 billion trips in 2014 – yet the symptoms of overdue maintenance and underinvestment have never been clearer or, in some cases, more dangerous.
- Despite increasing demand, the nation's transit systems have been chronically underfunded, resulting in aging infrastructure and a \$90 billion maintenance backlog.
- While some communities are experiencing a transit boom, many Americans still don't have access to public transit.



INLAND WATERWAYS



PORTS

Now let's look at the categories of greatest interest to you. We couldn't have done this without the help of AAPA, who served as a tremendous resource not just for data but also photos and video.

Inland Waterways

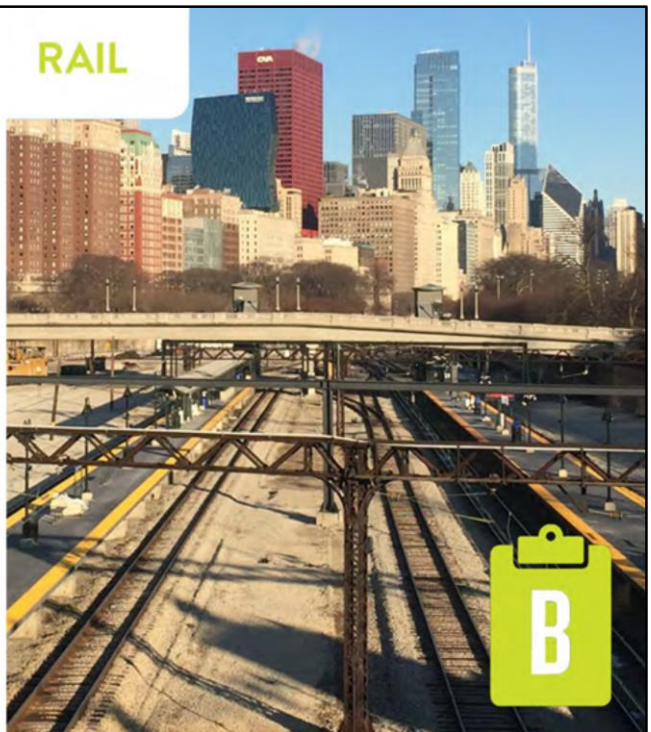
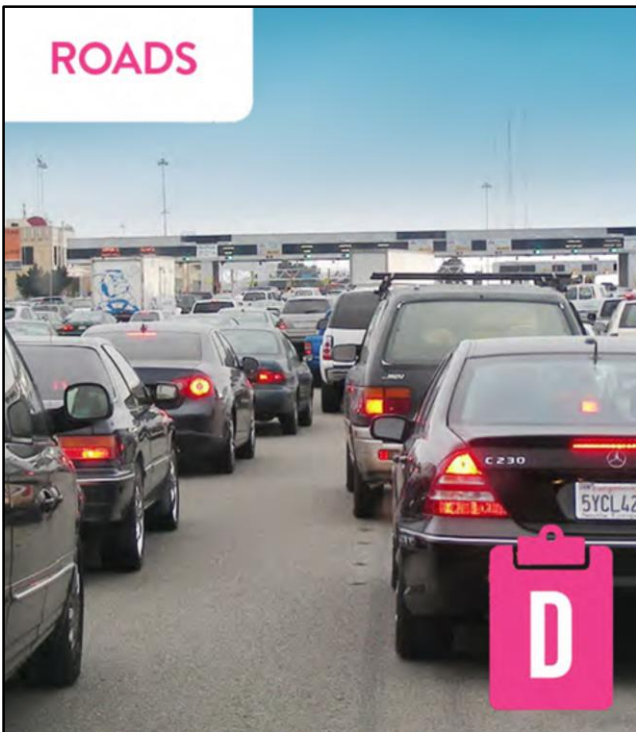
Grade: D (up)

- Our inland waterways received a grade of D, up from a D- in 2013.
- The United States' 25,000 miles of inland waterways and 236 locks form the freight network's "water highway."
- This intricate system, operated and maintained by the U.S. Army Corps of Engineers, supports more than half a million jobs and delivers more than 600 million tons of cargo each year.
- On one gallon of fuel a barge can move goods four times farther than trucks, making barge transport the most fuel-efficient way to move goods on the ground.
- Most locks and dams on the system are well beyond their 50-year design life, and nearly half (49%) of vessels experience delays. Between 2000 and 2014, average delay per lockage nearly doubled from 64 minutes to 121 minutes. Coupled with increasing traffic, vessel may be delayed for hours while aging locks are shut down for maintenance and repair.
- While data on lock delays are inconsistently tracked, the overall number of hours during which parts of the system are unavailable has declined; in 2015 the system's unavailable hours reached their lowest level in a decade.
- Investment in the waterways system has increased in recent years but upgrades on the system still take decades to complete. Projects once on the books that were expected to be completed in 2090 are now on track to be completed in 2038.

Ports

Grade: C+ (up)

- The condition of our nation's ports improved from a C to a C+.
- The United States' 926 ports are essential to the nation's competitiveness, serving as the gateway through which 99% of overseas trade passes. The top 10 U.S. ports accounted for 78% of U.S. foreign waterborne trade in 2015.
- Ports are responsible for \$4.6 trillion in economic activity, roughly 26% of the U.S. economy. The movement of goods through ports supports 23.1 million jobs, and provides \$321.1 billion in tax revenue to federal, state, and local governments.
- As ships get bigger, congestion at landside connections to other components of the freight network increasingly hinder ports' productivity.
- Similarly, on the water side, larger ships require deeper navigation channels which only a few U.S. ports currently have. To remain competitive globally and with one another, ports have been investing in expansion, modernization, and repair.
- The Fixing America's Surface Transportation (FAST) Act requires states to have state freight plans; most port-related investments are limited to state or local appropriations.
- To remain competitive both globally and with one another, ports have been investing into their facilities, and plan to spend \$154.8 billion in their facilities from 2016 to 2020 on expansion, modernization, and repair investments. Landside connections will receive only \$11 billion in new funding for landside freight improvements through 2020.



Since Ports operate as a system, the Road and Rail category should be of interest to you as well.

Road

Grade D (Same)

- Roads did not see an improvement; the 2017 grade remains a D
- More than two out of every five miles of America's urban interstates are congested.
- Traffic delays cost the country \$160 billion in wasted time and fuel in 2014.
- Over 35,000 people were killed in motor vehicle crashes in 2015.
- In 2014, Americas spent 6.9 billion hours delayed in traffic – that's 42 hours per driver.
- According to TRIP, driving on roads in need of repair costs U.S. motorists \$112 billion a year in extra vehicle repairs and operating costs.
- Most recent data shows a \$420 billion maintenance backlog on the nation's highways.

Rail

Grade: B (up)

- The condition of our nation's freight rail improved from a C+ to a B.; the highest grade in the Report Card in 2017
- The U.S. rail network's 160,000 miles of track, 100,000 rail bridges and 800 tunnels remain a critical component of the transportation system and economy, carrying approximately one-third of U.S. exports to ports and other distribution centers, delivering 5 million tons of freight, and transporting 84,600 passengers each day.
- The private freight rail industry owns the majority of the nation's rail infrastructure, and has made significant investment in recent years to meet current and future needs and accommodate changing cargo trends.
- However, U.S. rail still faces clear challenges, particularly on the passenger rail side, including addressing increasingly congested corridors, meeting safety technology demands, replacing 100-year old bridges, and improving rail interconnections with other aspects of the freight network for a more efficient system.
- In 2015 the freight railroads spent \$27.1 billion maintaining, growing, and modernizing the system with major track replacement projects, large capacity upgrades to permit double tracking, and the deployment of a new safety system, positive train control.
- Federal forecasts show a 40% increase in U.S. freight shipments over the next 30 years.
- In the next five years Amtrak's Northeast Corridor needs \$4.4B investment for basic infrastructure, an additional \$4.4B for major backlog projects, \$210M for mandated health and safety projects, and \$10.4B for service preservation and improvement. Funding for the effort falls short by one-half of what is needed.

Investment Gap

Infrastructure Systems	2016–2025 (10 years)		
	TOTAL NEEDS	ESTIMATED FUNDING	FUNDING GAP
SURFACE TRANSPORTATION	\$2,042	\$941	\$1,101
WATER/WASTEWATER INFRASTRUCTURE	\$150	\$45	\$105
ELECTRICITY	\$934	\$757	\$177
AIRPORTS	\$157	\$115	\$42
INLAND WATERWAYS & MARINE PORTS	\$37	\$22	\$15
DAMS	\$45	\$5.6	\$39.4
HAZARDOUS & SOLID WASTE	\$7	\$4	\$3
LEVEES	\$80	\$10	\$70
PUBLIC PARKS & RECREATION	\$114.4	\$12.1	\$102.3
RAIL	\$154.1	\$124.7	\$29.4
SCHOOLS	\$870	\$490	\$380
TOTALS	\$4,590	\$2,526	\$2,064

\$2.0
trillion
needed



FUNDING GAP | CURRENT FUNDING

The grades in the 16 categories are cause for concern and reflect the fact that America's infrastructure bill is long overdue.

In addition to grading the nation's infrastructure, every four years, ASCE estimates the investment needed in each infrastructure category to maintain a state of good repair and earn a grade of B.

Between 2016 and 2025, the estimated Investment Gap totals just over \$2.0 trillion.

For Inland Waterways and Ports alone, just over half of the infrastructure investment need is projected to be funded over the next 10 years, resulting in a gap of \$15 billion. However, this does not account for privately owned landside infrastructure and equipment that is critical to the freight network's effectiveness and efficiency.

Even though Congress and some states have recently made efforts to invest more in infrastructure, these efforts do not come anywhere close to what's needed; we've simply failed to invest for too long and now are struggling to catch up.

Failing to close this infrastructure investment gap brings **serious economic consequences**. According to ASCE's latest economic study, prepared in 2016, if we do not address the infrastructure investment gap:

- \$3.9 trillion in U.S. GDP will be lost by 2025;
- Businesses will lose \$7 trillion by 2025; and
- 2.5 million jobs will be lost in 2025.

Failing to close the Waterways and Ports gap alone will potentially lead to 440,000 fewer jobs in 2025, and by 2025 the nation will have lost almost \$800 billion in GDP.

On top of all of this, each American family is already losing \$3,400 in disposable income each year -- \$9 a day -- due to poor infrastructure. That's income we could be saving or spending on other things that make our lives better, but instead are spending on car repairs, wasted time and gas, and increased costs for goods.



To raise the national infrastructure grade over the next four years, ASCE urges the following starting points:

- **Investment**
- **Leadership & planning**
- **Preparation for the needs of the future**



Increase investment from all levels of government and the private sector **from 2.5 percent to 3.5 percent** of U.S. Gross Domestic Product (GDP) by 2025.

Put the “**trust**” back into “**trust funds.**”

Fix the Highway Trust Fund by raising the federal motor fuel tax

Authorize programs to improve specific categories of deficient infrastructure

Infrastructure owners and operators must charge, and Americans must be willing to pay, rates and fees that reflect the **true cost of using, maintaining, and improving all infrastructure**

Investment:

- If the United States is serious about achieving an infrastructure system fit for the 21st century, some specific steps must be taken, beginning with **increased, long-term, consistent investment**.
- Delaying investment escalates costs and risks of an aging infrastructure system – something the nation can no longer afford.
- To close the \$2.0 trillion 10-year investment gap, meet future need, and restore our global competitive advantage, we must **increase investment from all levels of government and the private sector from 2.5 percent to 3.5 percent of U.S. Gross Domestic Product (GDP) by 2025**.

This investment must be consistently and wisely allocated, and **must begin with the following steps:**

- **Put the “trust” back into “trust funds.”** Dedicated public funding sources on the local, state, and federal levels need to be consistently and sufficiently funded from user-generated fees, with infrastructure trust funds never used to pay for or offset other parts of a budget.
- **Fix the Highway Trust Fund by raising the federal motor fuel tax.** To ensure long-term, sustainable funding for the federal surface transportation program the current user fee must be raised and tied to inflation to restore its purchasing power, fill the funding deficit, and ensure reliable funding for the future.
- **Authorize programs to improve specific categories of deficient infrastructure** and support that commitment by fully funding them in an expedient, prioritized manner.
- Infrastructure owners and operators must charge, and Americans must be willing to pay, rates and fees that reflect **the true cost of using, maintaining, and improving all infrastructure**.

Specific to Ports and Waterways, we must:

- Increase overall investment into the freight program, to ensure ports can effectively distribute and receive goods as ships continue to grow in size.
- Appropriate funds to the congressionally-authorized projects to ensure that projects crucial to freight movement are completed in a timely manner, and do so consistently, including passing a Water Resources Development Act on a two-year cycle.
- Ensure that full use of the Inland Waterways Trust Fund continues to be appropriated, and increase the amount spent on operations and maintenance of the inland waterways each year.

SOLUTIONS

Leadership & Planning

- Leaders from all levels of government, business, labor, and nonprofit organizations must come together to ensure **all investments are spent wisely**
- Require all projects greater than \$5 million that receive federal funding use **life cycle cost analysis**
- Create incentives** for maintenance
- Develop tools** to prioritize projects
- Streamline the **project permitting process**
- Identify projects attractive to **private sector investment and public-private partnership**

Leadership & Planning:

- Smart investment will only be possible with leadership, planning, and a clear vision for our nation's infrastructure.
- **Leaders from all levels of government, business, labor, and nonprofit organizations must come together to ensure all investments are spent wisely**, prioritizing projects with critical benefits to the economy, public safety, and quality of life, while also planning for the costs of building, operating, and maintaining the infrastructure for its entire lifespan.

To do so, we must:

- Require all projects greater than \$5 million that receive federal funding use **life cycle cost analysis** and develop a plan for funding the project, including its maintenance and operation, until the end of its service life.
- **Create incentives** for state and local governments and the private sector to invest in maintenance.
- Develop tools to ensure that projects most in need of investment and maintenance are prioritized, to **leverage limited funding wisely**.
- **Streamline the project permitting process** across infrastructure sectors, with safeguards to protect the natural environment, to provide greater clarity to regulatory requirements, bring priority projects to reality more quickly, and secure cost savings.
- Identify a pipeline of infrastructure projects attractive to **private sector investment and public-private partnership**.

Specific to Ports and Waterways, we must:

- Give the US Army Corps of Engineers contract authority for projects, to avoid the stop-and-start of construction currently happening because of the appropriations process.
- Ensure that ports have a seat at the table as states create and execute freight plans.



Preparing for the Future:

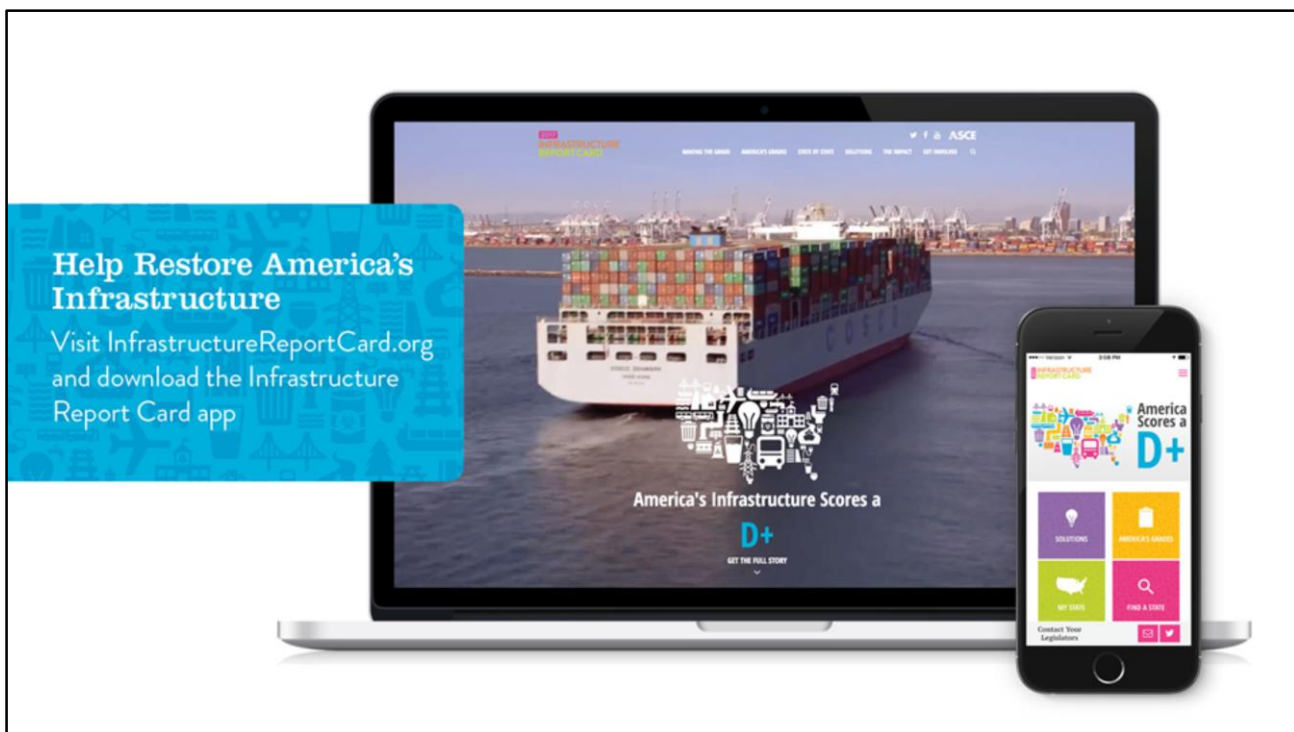
We must utilize new approaches, materials, and technologies to ensure our infrastructure is more **resilient** and **sustainable**.

This can be achieved by:

- **Developing active community resilience programs** for severe weather and seismic events to establish communications systems and recovery plans to reduce impacts on the local economy, quality of life, and environment.
- **Considering emerging technologies and shifting social and economic trends** – such as autonomous vehicles, distributed power generation and storage, and larger ships – when building new infrastructure, to assure long-term utility.
- **Improving land use planning** at the local level to consider the function of existing and new infrastructure, the balance between the built and natural environments, and population trends in communities of all sizes, now and into the future.
- **Supporting research and development** into innovative new materials, technologies, and processes to modernize and extend the life of infrastructure, expedite repairs or replacement, and promote cost savings.

Specific to Ports and Waterways, we must:

- Adopt new technologies to reduce wait times at docks, boost efficiency, and increase security.
- Improve freight and landside connections to strengthen the entire freight system and reduce congestion that is costly to the economy when moving goods.
- Develop and implement a standardized measurement for delays on the system.



Opportunity exists right now to make good on these recommendations to solve our nation's infrastructure crisis, as the Trump Administration and U.S. Congress weigh infrastructure legislation and state and local governments around the country look to take action in their communities.

ASCE is encouraged by the signs from President Trump and leaders in Congress to potentially work together on this bipartisan issue that will contribute to significant gains for the American economy and families.

All levels of government and the private sector must partner to close our infrastructure deficit, commit to a future in which we improve infrastructure, and value it as key to our quality of life and economic prosperity.

Every day of delay escalates our shared costs, jeopardizes our health and risks our security – an option our country, economy and communities can no longer afford.

We urge you all to take the first step by visiting InfrastructureReportCard.org and downloading the Save America's Infrastructure App. Explore the Report Card, videos, infographics, and interactive content, and share it with others.

Thank You

www.infrastructurereportcard.org | reportcard@asce.org



Thank you again for the opportunity to share the Report Card with you today, and thanks to AAPA for their assistance with the 2017 Infrastructure Report Card.

We hope you'll join ASCE in our efforts to save America's infrastructure and prioritize the types of investments that will ensure our country is built for the future.

I'd be happy to take your questions, and you are welcome to contact ASCE at reportcard@asce.org.