

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, as well as the wastewater category, which may be of the most interest to those of you in the audience:

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.

Wastewater earned a D+, up from a D in 2013.

- Years of treatment plant upgrades and more stringent regulations have significantly reduced untreated releases and improved water quality across the country.
- It is expected that more than 56 million new users will be connected to centralized treatment systems over the next two decades, and an estimated \$271 billion is needed to meet current and future demands.
 - 95% of spending on water infrastructure is made at the local level.
 - It is estimated local governments spend \$20 billion a year on capital sewer expenditures and \$30 billion annually on O&M.
 - The federal government provides some assistance through the Clean Water State Revolving Fund program, primarily with discounted loans, and more recently, the WIFIA Act, which finances and funds large water infrastructure projects (over \$20 million).
- Stormwater:
 - In approximately 772 communities in the U.S., wastewater and stormwater drain into the same treatment system. These combined sewer systems can experience capacity issues following heavy rain events, resulting in overflows containing stormwater as well as untreated human and industrial waste, toxic substances, debris, and other pollutants.
 - Called combined sewer overflows (CSOs), these occurrences can significantly impair water quality and impact public health and wildlife and are a leading source of water pollution in the U.S.
 - The problem is exacerbated when communities have large amounts of impervious surfaces – concrete sidewalks, roads, parking lots, traditional roofs – that increase the amount of runoff entering the stormwater system.
 - In the past, data on CSOs was limited. However, in 2015 the EPA finalized a system to report CSOs electronically, meaning better data on these events will soon be available to the public.
- New methods and technologies allow plants to treat more wastewater, often discharging a cleaner product back into the environment; turn waste into energy; and help communities to better manage precious water supplies through reuse.

Investment Gap

2016–2025 (10 years)

Infrastructure Systems	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 these 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.

- 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, *Failure to Act*, 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.

On top of that, each American family is already losing \$3,400 in disposable income each year – more than \$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.

With about \$4 a day – the price of a nice cup of coffee – we can solve this.

So what do we do about the poor state of our nation’s infrastructure and this widening investment gap?



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

Investment,
Leadership & planning, and
Preparation for the needs of the future.

SOLUTIONS
Investment

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.**

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**.

SOLUTIONS

Preparation for the future

RE-SIL-IEN-CY n.
To more quickly recover from significant weather and other hazard events

SUS-TAIN-A-BIL-I-TY n.
Improving the “triple bottom line” with clear economic, social, and environmental benefits

Develop active **community resilience programs**

Consider **emerging technologies and shifting social and economic trends** when building new infrastructure

Improve **land use planning** at the local level

Support **research and development** into innovative new materials, technologies, and processes

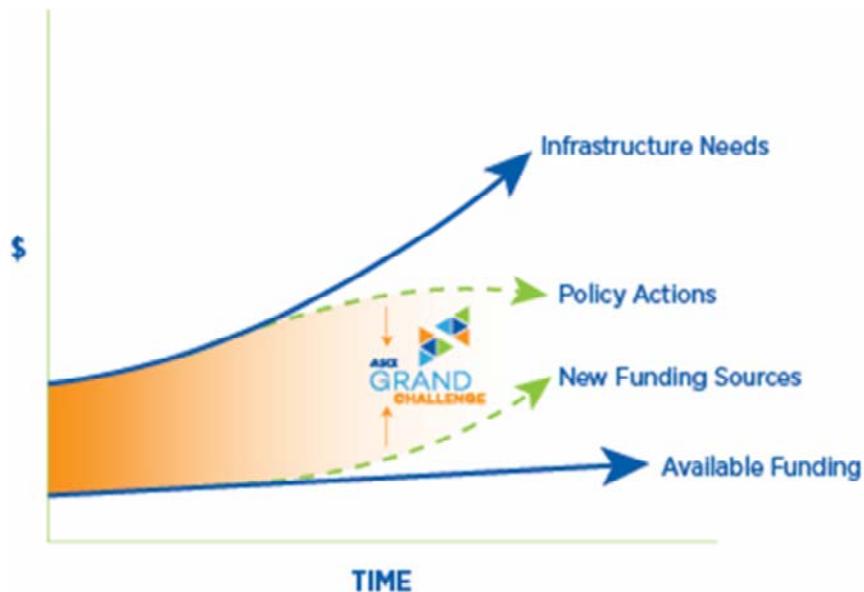
Preparing for the Future:

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.

Closing the Infrastructure Gap



In addition to advocating for our recommendations to raise the grade to elected officials and decision-makers, ASCE believes all civil engineers can be part of the solution to closing the infrastructure investment gap.

The [ASCE Grand Challenge](#) asks all civil engineers to join in the solution to :

- Significantly enhance the performance and value of infrastructure projects over their life cycles by 2025
- Foster the optimization of infrastructure investments for society.
- To reach this goal, the profession must influence major policy changes and infrastructure funding levels, while challenging civil engineers to focus on innovation, rethink life cycle costs, and drive transformational change—from planning to design to delivery.

There's no magic wand to address this crisis, either from an infrastructure money tree or from the private sector so often touted as the key to revitalizing infrastructure. Solving our infrastructure crisis will take collective action and tough choices. We all need to work together to ensure our infrastructure is built for the future.



Thank you again for the opportunity to share the Report Card with you today, and for your interest in this critical topic that underpins our quality of life, public safety, public health, and the success of the American economy.

I'd be happy to take any questions, or you can contact us at ReportCard@asce.org.