# RAIL SAFETY IN THE UNITED STATES

2016



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# I. FOREWORD

OneRail is a broad coalition of stakeholders, including rail owners, operators, suppliers, employees, and advocates who have come together to act as a voice in support of passenger and freight rail and to expand awareness about the critical role rail plays in our nation's transportation system.



The safety of our transportation system justly receives a lot of attention. Every form of transportation is monitored closely by industry participants, governments, and the public for fatalities and injuries to both users and employees. Accidents can result in human tragedy and also disrupt freight and passenger service, neither of which is acceptable.

Due to the ongoing work of railroads, their employees, customers, funding partners, and regulators, rail is safer than its main competition and safer than it's ever been. Trends in rail safety over the past ten years have shown a strong and steady improvement. A variety of new initiatives are underway that will make rail even safer going forward.

#### Rail plays an important role in the nation's transportation system:

The nation's nearly 140,000 mile freight rail network carries approximately 40% of the nation's intercity freight by ton-miles, including raw materials, agricultural products, finished goods, imports, and exports. Intercity passenger rail, provided by Amtrak, serves more than 500 communities in 46 states on more than 21,000 route miles, while commuter rail provides service to over 1,200 stations in 21 states on 7,760 track miles. The 457-mile Northeast Corridor alone hosts 260 million intercity and commuter rail trips annually, earning 77% of the air/rail travel market between Washington, D.C. and New York City, and 57% of air/rail travel between New York City and Boston. Ridership on Amtrak's national network of state supported and long distance passenger trains accounts for more than half of total intercity passenger rail ridership. The nation's intercity and commuter rail systems experienced a 23% increase in ridership over the past decade, growing at a faster pace than either air or highway travel.

While the benefits of our freight and passenger rail system are many, including economic development, mobility, energy efficiency, and environmental sustainability, this report focuses on the overall safety of travel by rail. The report compares rail safety to other modes and industries, documents core statistics on rail safety, highlights successful approaches that have improved the safety of travel by rail, and points toward newer efforts to ensure that rail becomes an even safer way for freight and passengers to travel.

The positive safety trends in rail have been achieved through collaboration between railroads, their employees, customers, funding partners, and regulators, buttressed by significant private investment in the freight rail network, introduction of new technologies, and public outreach.

To continue improving rail safety, the rail industry's attention is now targeted on lowering accidents internal to the rail network. Through improvements to rail operations and infrastructure, safer operating practices, improved inspection technology, and data analysis to closely monitor the health of the network, the goal is to make rail an even safer mode of transportation.

Anne Canby Director, OneRail Coalition





# II. TRANSPORTATION SAFETY: RAIL IS SAFER THAN THE PRIMARY COMPETITION

Getting people and goods out of cars and trucks and onto trains saves lives



When looking at accidents and fatalities across the transportation modes, far more people die on our highways than our rail systems, both because there are more people traveling on our roads and also because the accident and fatality rates for the highway mode are far higher than for rail.

The chart below captures transportation-related fatalities in the United States over the past 10 years, segmented by mode. While the overall trend in transportation related fatalities has been

positive, there are still far too many fatalities on an absolute basis, and as the chart demonstrates, the overwhelming majority of fatalities take place on the highway system. In fact, the most recent safety and census data indicate that the average American has a lifetime risk of approximately 1 in 100 of dying in a car accident<sup>1</sup>. Motor vehicle crashes are one of the leading causes of preventable death, and are even the #1 leading cause of death for American teenagers<sup>2</sup>.



CHART I

<sup>1</sup>Footnote: 1 in 84 according to http://well.blogs.nytimes.com/2007/10/31/ how-scared-should-we-be/?\_r=0, 1 in 113 according to http://www.iii.org/factstatistic/mortality-risk, 1 in 113 according to http://www.nsc.org/learn/safetyknowledge/Pages/injury-facts-chart.aspx  $^{2} http://www.cdc.gov/motorvehiclesafety/teen_drivers/teendrivers_factsheet.html$ 

#### CHART II



Rail, by contrast, is far safer. When measured by fatalities per billion passenger miles, riding intercity passenger rail (.87<sup>3</sup>) or commuter rail (.373<sup>3</sup>) is on average more than 10 times safer than riding in a passenger car (7.033<sup>3</sup>).

Looking at freight accidents per 10 billion ton-miles, fatal accidents involving freight rail take place at

less than one third the rate of truck accidents (3.6 vs 11), accidents involving injuries are one fifth as frequent, and property damage accidents are 62 times less frequent.

<sup>&</sup>lt;sup>3</sup>https://www.rita.dot.gov/bts/sites/rita.dot.gov.bts/files/publications/national\_transportation\_statistics/html/table\_02\_01.html and http://www.rita.dot.gov/bts/ sites/rita.dot.gov.bts/files/publications/national\_transportation\_statistics/html/table\_01\_40.html





These differences in fatality and accident rates highlight the value of taking a broader look at how we travel. From a safety perspective, goods and people face a higher risk of accident, injury or fatality when traveling by the main competing modes of surface transportation, truck or passenger vehicle, compared to freight and passenger rail. Simply put, getting more people and goods out of cars and trucks and onto trains would save lives.

For instance, the data demonstrates that for every 10 billion ton-miles of freight that we could shift from highway to rail (approximately a one half of one percent increase in freight rail volumes), more than 7 lives would be saved. On the passenger side, if just one percent of the nation's approximately three trillion annual vehicle miles traveled by motor vehicle could be shifted to intercity passenger or commuter rail, approximately 200 lives would be saved each year.

Increasing market share for rail would have a significant impact on transportation safety. If federal and state governments invested their transportation funds and regulated their transportation modes with the explicit public policy goal of increasing freight and passenger rail utilization, hundreds if not thousands of lives would be saved every year.



# III. RAIL SAFETY: TEN YEAR TRENDS

Investment in rail infrastructure, particularly track and equipment, plays a key role in preventing accidents





CHART IV

# %

# Safety trends over the past 10 years:

- **31%** Decline in train accident rates
- 33% Decline in derailment rates
- 23% Decline in grade-crossing incidents
- **72**% Decline in release of hazardous materials
- 17% Decline in employee casualty rates

Rail safety has been trending in the right direction over the past ten years even as passenger rail traffic has grown and freight rail traffic has held steady. The accident rate for rail has declined 31% since 2006, making a safe mode of transportation even safer. This is reflected in the decline in derailments, collisions, and all other types of accidents for both forms of service.







#### What has contributed to this trend?

There are a number of factors that have led to the decline in the accident rate for rail. The condition of rail infrastructure, particularly track and equipment, plays a key role in preventing accidents, as has the implementation of new technology over the past decade.

Much of that technology was developed at the Transportation Technology Center, Inc. (TTCI), a world-class transportation research and testing organization, providing technology solutions for the freight and passenger railway industry. TTCI, with its 48 miles of test track, has played a key role in the development of technologies such as communications-based train control, positive train control, wheel rail interface management, instrumented wheelsets, vehicle and track components, signaling/safety devices, trackside acoustic detection systems, and performance monitoring data collection and analysis systems.

#### a. Investment

Privately owned class I freight railroads have spent more



than \$200 billion over the last 10 years to improve the overall condition and capacity of their networks, leading to a safer and more efficient network. In 2015 alone, their combined maintenance and capital expenditure investments on rail infrastructure and equipment were over \$30 billion.







While capital is far more constrained and unpredictable for Amtrak and the nation's 28 commuter railroads, they and their state and local partners nonetheless invested more than \$4 billion in federal, state, local, and self-generated sources in 2014, which improved safety and reliability.

A more specific look at certain areas provides a greater understanding of how rail safety has improved.

## b. Rail-Highway Grade Crossings

The collision rate at rail-highway crossings has declined by 23% over the past 10 years.

#### What has contributed to this trend?

Over the years, through increased attention from states, railroads, and communities, crossings have been consolidated, signage has been improved,





new warning devices have been added, and over time an increasing number of motorists have begun to understand the dangers inherent in crossing live railroad tracks.

#### **SECTION 130**

The federal program for railway-highway grade crossing safety (known as Section 130) provides states with dedicated funding to improve crossing safety. The states take responsibility for evaluating grade crossing risks and prioritizing grade crossings for improvement, including the decisions to install specific types of warning devices at particular public grade crossings. The program has provided approximately \$2 billion over the past decade, and states and railroads will continue to partner into the future to effectively invest these funds.

#### **RAILROAD SAFETY CAMPAIGNS**

In 2007, Norfolk Southern launched their 'Train Your Brain' safety campaign to raise public awareness about the dangers at rail crossings and on railroad property. Brainy is a silent safety sentry who without saying a word helps train people to be smart around grade crossings and railroad property. To date, the campaign has run in TN, NC, IN and OH.





#### **OPERATION LIFESAVER SAFETY INITIATIVES**

Operation Lifesaver (OLI) is a nonprofit public safety education and awareness organization dedicated to reducing collisions, fatalities and injuries at highway-rail crossings and trespassing on or near railroad tracks. OLI produces Public Service Announcements (PSAs) for radio and TV, is active on social media, develops educational videos, provides interactive e-Learning programs for professional drivers and school bus drivers, publishes educational brochures and posters, and offers free in-person presentations by their authorized volunteers in most areas of the country. Over 2,000 Operation Lifesaver authorized volunteers make safety presentations in their communities, reaching over 2 million people per year. The organization has signature taglines for rail crossing safety and trespass prevention such as "Look, Listen and Live," "Stay Off, Stay Away, Stay Alive," and "See Tracks?, Think Train!"

#### **DRIVER EDUCATION**

Amtrak developed a film, Cheating Death, to warn teen drivers of the dangerous consequences of failing to obey highway-rail grade crossing signals. The video features real footage from dozens of actual and near-miss grade crossing and trespassing incidents, and serves as a stark warning to new drivers. It is shown as part of driver education programs. In addition, OLI uses the video as part of their prevention outreach efforts.

#### **OFFICER ON THE TRAIN**

This program on the BNSF Railroad gives local law enforcement officers the opportunity to observe motorist and pedestrian behavior from the cab of a locomotive to learn about grade crossing safety laws and get a sampling of compliance levels. When they spot a violation, they contact patrol units on the ground to enforce it. The experience also gives them a better understanding of how trains operate. Traffic citations or warnings are often issued as part of these exercises.

#### SEALED CORRIDORS

Many railroads, in collaboration with states and local communities, have undertaken long-term efforts to remove as many highway-rail grade crossings as possible, with some states looking to create "sealed corridors" in areas of particularly dense or fast-moving train traffic.

For example, the North Carolina Department of Transportation Sealed Corridor Program, in partnership with the Federal Railroad Administration and Norfolk Southern Railroad, works with communities along the Raleigh-Charlotte corridor to eliminate or improve railhighway grade crossings by using enhanced traffic control devices, crossing closures, and grade separations to enhance safety and reduce accidents between train and automobile traffic. In 1992, only 30% of the state's 5,000 public railroad crossings had flashing lights and gates. Today, automatic warning devices are in place at 60% of the now 4,100 public crossings in North Carolina, meaning the number of unprotected crossings has dropped more than 50% since 1992, from 3,500 to 1,640. The effectiveness of the crossing safety improvements has been validated by video monitored tests which showed a 67-98% reduction in gate violations, depending on the enhanced treatments. Based on Fatal Crash Analysis by the USDOT Volpe Center, the projects implemented on the Sealed Corridor save an estimated 20 lives over a ten-year period.

### c. Reducing Derailments

There has been a marked decline in derailments, even as passenger ridership has increased and freight volumes have been steady over the last ten years.

CHART VIII - IX





**OneRail** 

#### What has contributed to this trend?

**TRACK GEOMETRY CARS** enable the use of high-tech sensors to detect track alignment defects, track surface defects, gauge defects, cross level defects, and other dangerous conditions. The ability to detect defects when they are only minor allows maintenance crews to make repairs at the first sign of deterioration, reducing the possibility of defects causing a derailment.



WELDED RAIL provides a continuous, smoothrunning surface for trains and eliminates vulnerable rail joints. High quality welded rail allows heavier and faster trains to operate more safely than ever before. To date, more than 108,000 miles of welded rail have been laid by the Class 1 railroads alone. Almost 100% of Amtrak-owned track is welded rail.

**ULTRASONIC RAIL TESTING** assists in detecting a variety of microscopic irregularities, such as transverse defects, vertical split heads, and rail joint failures. This testing, done by sophisticated hi-rail vehicles moving at speed across the rail network, expands the miles of track inspected per day.



**TREATED WOOD CROSSTIES** have been a major component of rail infrastructure for over 150 years, and improvements to them have contributed to this safety trend. Research has led to innovative "dualtreatment" for wood, which not only extends the life of wood crossties, but also inhibits corrosion in metal spikes used to fasten rail to track, leading to advancements in rail-to-tie fastener performance. Railroads have combined this technology with their own data and experience to optimize maintenance practices over the past decade.



**EQUIPMENT MONITORING** technologies such as wayside detectors, wheel and profile monitors, and trackside acoustic detector systems can identify potential problems before accidents





occur, allowing railroad employees to address the sisue and keep the system running safely.

# d. Transport of Hazardous Materials

Accidents involving hazardous materials have declined by 72% over the last decade.

#### What has contributed to this trend?

Investments in rail infrastructure and improvements noted above such as track geometry cars, welded rail, ultrasonic rail testing, wood crossties, and equipment monitoring help to decrease all types of derailments, including HazMat accidents. Enhanced track inspection for routes carrying a certain amount of hazmat each year and ever-safer rail cars are among the targeted improvements aimed specifically at HazMat safety. In addition, stronger safety protocols such as voluntary speed restrictions and risk-based routing have reduced the frequency and severity of accidents with a release of hazardous material.

**SPEED RESTRICTIONS** to 40 mph are in place for key trains carrying crude oil in High Threat

Urban Areas.

Railroads use a **RISK-BASED ROUTING** protocol, known as the Rail Corridor Risk Management System, which evaluates 27 risk factors to assign the most safe and secure route for trains moving hazardous materials.

**TANK CARS** built today are vastly improved over earlier generations, with higher grade steel, better thermal protection, improved valves and fittings, and often thicker tanks. A new federal rule set even tougher standards for new tank cars going forward and ordered that existing tank cars that carry flammable liquids be retrofitted with enhanced safety features or phased out.



# e. Employee on duty Casualties

The employee casualty rate has declined 17% since 2006 – a significant accomplishment in an outdoor heavy-industry profession that employs over 200,000 workers.

#### What has contributed to this trend?

**CONFIDENTIAL CLOSE CALL REPORTING SYSTEMS (C3RS)** are voluntary confidential programs allowing railroad carriers and their employees to report close calls. These programs are designed to provide a safe environment for employees and railroads to report unsafe events and conditions, allowing all parties to focus on analyzing close calls and determining corrective actions. In addition to the involvement of rail carriers and employees, expertise is provided by the FRA, NASA, and the Volpe Center. The C3RS system can produce valuable safety data that would not otherwise be available. Amtrak formalized this policy with their UTU and BLET labor partners in 2010.



CHART XI



Railroads also have a better employee safety record than many other industries and transportation modes.



CHART XII





# **IV. LOOKING AHEAD**

As the phased array ultrasound detection unit pulses electronic signals towards the rail, safety experts inside the inspection vehicle will monitor real-time feedback on computer screens. These inspection vehicles will travel the network, regularly monitoring the health of the nation's rail system.



#### CHART XIII



As demonstrated throughout this paper, rail transportation is a safer way to travel in comparison to the primary alternatives - personal vehicles and trucks. Within rail itself, safety has been consistently improving over the last decade, and the trends are pointing in the right direction. However, there are still accidents and fatalities within the system, which must be eliminated.

Understanding where fatalities and accidents occur helps to identify where more needs to be done to continue the positive trends of the past ten years.

An overwhelming majority, 92%, of rail accidents involving fatalities are the result of trespassing on rail property or highway-rail grade crossing accidents. Trespassing along railroad rights-ofway is the leading cause of rail-related deaths in America. Nationally, more than 400 trespass fatalities occur each year, the majority of which are suicides.

Of all train-related accidents (other than grade crossings), about two-thirds are caused by either human factors or track-related defects. Continued research, investment and innovation will focus on these areas, with a goal of further reducing accidents and fatalities.

Examples of new areas that are being pursued include:



# a. Trespassing and Grade Crossing Incident Prevention

Operation Lifesaver will continue to focus on educating the public about the risks of trespassing near railroad tracks.



In particular, OLI will begin focusing on the problem of individuals taking photographs of friends on railroad tracks, and also the growing prevalence of 'selfies.'

In addition to OLI's efforts, many railroads have begun to make use of social media to engage the public on the dangers of trespassing and stopping on tracks at crossings.

An Emergency Notification System (ENS) sign is located at every highway-rail grade crossing. The purpose of the sign is to educate everyone to use the ENS number should they see any type of situation that the railroad needs to address or which requires stopping railroad traffic to avert an accident, such as: (1) malfunctions of warning signals, crossing gates and other safety devices at the crossings; (2) disabled cars, trucks or other vehicles blocking the railroad tracks at the crossings; (3) the presence of trespassers on the tracks or along the right of way at the crossing; and (4) any other information relating to an unsafe condition at the crossing. Amtrak has

recently launched an education campaign encouraging the writers of state driver's education manuals to include information on the ENS in the manual.



The United States Department of Transportation's John A. Volpe National Transportation Systems Center (Volpe Center) is conducting a trespass prevention research study to document best practices and lessons learned for implementation and evaluation of trespass prevention strategies on the rail network in West Palm Beach, Florida. Volpe is developing a set of national recommendations based on the community based trespass problem-solving process<sup>4</sup>.

# b. Highway-Rail Grade Crossing Action Plans

The new FAST Act requires the Federal Railroad

<sup>4</sup>Footnote: https://www.volpe.dot.gov/infrustructure-systems-and-technology/ systems-safety-and-engineering/preventing-rail-trespass Administration to develop and distribute to each state a model of a state-specific highwayrail grade crossing action plan. This plan must include methodologies, tools, and data sources to identify and evaluate highway-rail grade crossing safety risks, including the public safety risks posed by blocked highway-rail grade crossings due to idling trains, best practices for reducing the risk of highway-rail grade crossing accidents or incidents, and complete information on highwayrail grade crossing accidents or incidents. The states, in turn, are required to update or develop and implement their highway-rail grade crossing action plan identifying high risk crossings and specific strategies to improve safety at crossings. The award of rail grants may be conditioned on a state submitting an acceptable action plan.

# c. Safety Analysis Process

Some labor unions and railroads have implemented new safety management processes intended to foster a stronger and more robust safety culture. For instance, the Union Pacific Railroad and the Brotherhood of Maintenance of Way Employes have created a Safety Analysis Process which establishes dedicated safety coaches and advanced training of employees with the goal of identifying and eliminating factors that lead to safety-related rule violations. The railroad and its employees work together to analyze the factors in any given event, develop and implement a corrective action plan to reduce the chance of re-occurrence, provide scheduled follow-ups, and collect and analyze data to make sure the system is working as intended.



d. System Safety Program (SSP)



The recently issued SSP rule requires passenger railroads to implement a defined and measurable safety culture, identify potential safety hazards in their operations and work to reduce or eliminate those hazards, and document and demonstrate how they will achieve compliance with FRA regulations. Proactively identifying potential safety hazards will help prevent safety problems from escalating, resulting in fewer incidents, injuries and deaths.



# e. Short Line Safety Institute

The American Short Line and Regional Railroad Association's (ASLRRA) newly formed Short Line Safety Institute (SLSI) will heighten the short line and regional railroads' focus on safety culture by combining onsite assessments with education, training and research. SLSI will assess the operations and safety programs of short line railroads, develop best practices and work with short lines and regionals to implement these practices, and help improve safety culture and safety knowledge across the short line industry.

# f. Big Data

The rail industry is expanding the Asset Health Strategic Initiative program to compile and analyze massive amounts of data collected across multiple railroads in order to gain more complete information and make better decisions regarding the maintenance, care and operation of rail cars, with the goal of improving rail safety.

In addition, individual railroads collect vast troves of data from equipment monitoring and inspection technologies, which allows them to make predictive and proactive risk-reduction decisions regarding the maintenance of rail cars, locomotives, and track infrastructure.

# g. Phased Array

Phased array ultrasound technology will improve on existing ultrasonic rail inspection techniques, and allow railroads to identify essentially every track imperfection and overcome the challenges faced with conventional ultrasound inspection, such as inconclusive results from worn rails. This will involve a sophisticated, custom-built computer system and accompanying software to interpret the results. Inspectors will be able to use phased



array ultrasound to examine a rail from multiple angles simultaneously. Like traditional ultrasound inspection techniques, phased array units will be installed on the underbelly of inspection vehicles and driven down rail tracks. As the phased array unit pulses electronic signals towards the rail, safety experts inside the inspection vehicle will monitor real-time feedback on computer screens. These inspection vehicles will travel the network, regularly monitoring the health of the nation's rail system.

# h. Positive Train Control

Positive Train Control technology is designed to avoid certain train accidents. When fully installed and operational, PTC will prevent train-to-train collisions, derailments due to excessive speed, entry on track where maintenance activities are underway, and the improper movement of a train through a switch. PTC will supplement existing train control systems.

Freight railroads, Amtrak, and the states have spent more than \$6.7 billion since 2008 developing and implementing positive train control. By the time the technology is fully implemented, freight, intercity and commuter railroads combined expect to have spent over \$13 billion on this unprecedented safety undertaking. As an example of the magnitude of this safety initiative, the New York Metropolitan Transportation Authority secured a \$967 million FRA RRIF loan in May 2015 just to cover the costs of installing positive train control on the Metro North and Long Island Rail Road commuter rail systems.



difficult terrain, or extreme weather, allowing for safer and more effective deployment of rail workers. Several other Class 1 freight railroads are gearing up to incorporate drones, including Union Pacific, which last year secured FAA approval to use drones for aerial data collection. The company also is assessing using drones for hard-to-do inspections, such as those of elevated bridges and several hundred feet tall telecommunications antennas.



## i. Drones

BNSF Railway is one of the first three companies in the United States participating in the FAAsponsored "Pathfinder" program to explore commercial use of drones beyond operations proposed in the FAA's Part 107 Unmanned Aircraft Systems rules. BNSF is using drones to inspect sections of the rail network that are difficult to access from the ground due to natural disasters,



# **V. CONCLUSION**

Increasing market share for rail by getting more goods and people onto trains would save lives.





To make safety truly the top priority in transportation, it's time to take a broader look at how we travel. Putting greater emphasis on moving people and goods by commuter, intercity and freight rail would be a good first step. Rail is safer than its main competition and safer than it's ever been. A host of new initiatives are underway that will make rail even safer going forward. Simply put, increasing market share for rail by getting more goods and people onto trains would save lives and reduce injuries, significantly improving the overall safety of the nation's transportation system. The recently enacted FAST Act takes some positive steps in this direction, but there is still much more to do.



# a. Additional Resources

- American Public Transportation Association:
  <u>www.apta.com/resources/safetyandsecurity/Pages/safetycorner.aspx</u>
- American Short Line and Regional Railroad Association: <u>www.aslrra.org/web/Safety</u>
- Amtrak: <u>www.amtrak.com/ccurl/400/323/2015-Amtrak-Sustainability-Report.pdf</u>
- Association of American Railroads: <u>www.aar.org/todays-railroads/safety</u>
- Federal Railroad Administration (FRA): <u>www.fra.dot.gov</u>
- NASA Confidential Close Call Reporting System (C3RS): <u>http://c3rs.arc.nasa.gov</u>
- National Railroad Construction and Maintenance Association: <u>www.nrcma.org/safety</u>
- Operation Lifesaver, Inc: <u>www.oli.org</u>
- RSI Committee on Tank Cars Resource Center: <u>www.tankcars.rsiweb.org</u>
- Transportation Technology Center, Inc: <u>www.ttci.aar.com</u>
- United Transportation Union: <u>www.utu.org/safety</u>



# **ABOUT THE ONERAIL COALITION**

OneRail is a diverse group of rail stakeholders who have come together to educate America about the benefits of astrongfreightandpassengerrailsystem. Our members include the American Association of Private Railroad Car Owners (AAPRCO), American Public Transportation Association (APTA), American Short Line and Regional Railroad Association (ASLRRA), Amtrak, Association of American Railroads (AAR), Brotherhood of Locomotive Engineers and Trainmen (BLET), Brotherhood of Maintenance of Way Employes (BMWE), Brotherhood of Railroad Signalmen (BRS), National Association of Railroad Passengers (NARP), National Railroad Construction and Maintenance Association (NRC), Railway Supply Institute (RSI), SMART Transportation Division, States for Passenger Rail Coalition (S4PRC), Surface Transportation Policy Project (STPP), and the Transportation Communications International Union/ International Association of Machinists (TCU/IAM).

Our Corporate Supporters include AECOM, Alstom, Caterpillar, General Electric, HNTB, WSP | Parsons Brinckherhoff, and Siemens. These global companies represent the engineering and manufacturing sectors that are an essential component of private sector job creation in the transportation industry in the United States.







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