



AMERICANS  
FOR MODERN  
TRANSPORTATION

# Moving America Forward

## Modernizing America's Transportation Infrastructure

- **America needs to supplement infrastructure investment with modern transportation technologies to meet the demand of the digital economy.**
- **Safety, efficiency, and sustainability are core tenets of a modern transportation system.**
- **The private sector and government must work in tandem to achieve these goals.**

Newspaper headlines in 2017 are filled with promises of drones, driverless cars, and artificial intelligence. Ironically, the newspapers bearing headlines about futuristic technologies are delivered over pothole-ridden roads, congested highways, and deficient bridges.

The disconnect is stark. It's time we close the innovation gap and make the infrastructure changes needed to facilitate the creation and adoption of smart transportation technology.

Over 122.5 million households and 7.5 million businesses rely on deliveries from America's trucks, which now transport 70.1 percent of total commercial freight; up 24 percent since 2000 (See Fig. 1) and expected to increase another 27 percent by 2027.<sup>1,2,3</sup> A growing economy and the rise of e-commerce means U.S. consumers and businesses are

increasingly reliant on an efficient transportation system.

America needs to pair ongoing investment in infrastructure with a modernized transportation system to meet the needs of today's consumers and realize the benefits of the booming digital economy. Pursuing increased investment

alone would be like repaving our roads only to have horses and buggies use them.

There are many opportunities for the public and private sectors to usher in our country's next generation

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**"Today, 122.5 million households and 7.5 million businesses rely on America's trucks to transport 70.1 percent of total commercial freight"**

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of transportation policy advancements in the year ahead. While private companies actively invest in new technologies, such as upgraded fleets and safety equipment, the public sector must mirror this commitment to ensure our transportation system is as efficient, sustainable, and safe as possible.

The following report provides an overview of the current state

of American transportation and recommendations for action that will move America forward in 2017.

## The State Of Our Current Infrastructure

By almost every measure, it is clear that America's infrastructure system is failing. The American Society of Civil Engineers, the World Economic Forum, commercial truck operators, and millions of American drivers on the road have reached the same conclusion.

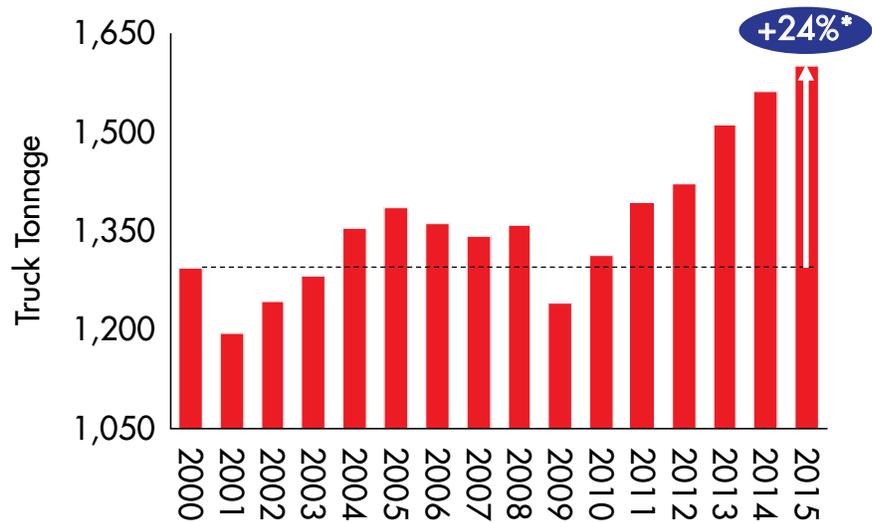
Every four years since 1988, The American Society of Civil Engineers has issued the Report Card for America's Infrastructure, scoring each segment of American infrastructure from A (Exceptional) to F (Failing). Since the Report Card's inception, "the grades have been near failing, averaging only Ds, due to delayed maintenance and underinvestment across most categories."<sup>4</sup> In 2013, the most recently released Report Card, the nation's infrastructure earned a cumulative GPA of D+, rising slightly from the previous edition.

Particularly concerning are the grades assigned to roads and bridges, a D and C+ respectively. The Report Card notes the recent success of targeted efforts to repair some of the nation's most neglected roads, however "forty-two percent of America's major urban highways remain congested, costing the economy an estimated \$101 billion in wasted time and fuel annually."<sup>5</sup>

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**Fig. 1: The Amount Of Goods Moved By America's Trucks Is At An All-Time High**

## Freight Tons Transported By Trucks Over Time



\*Change between 2000-2015

Sources: U.S. Department of Transportation, Federal Reserve Bank Of St. Louis, American Trucking Association

While the overall grade for bridges increased over the last four years, one in nine bridges across the country is rated as structurally deficient, averaging 42 years in age. The lack of new or repaired bridges means "over two hundred million trips are taken daily across

deficient bridges in the nation's 102 largest metropolitan regions."<sup>6</sup>

The failing state of American infrastructure has been noted on the international stage as well. In their

annual Global Competitiveness Report, the World Economic Forum highlighted the United States' significant drop in the global ranking of infrastructure quality.<sup>7</sup> Over the last decade, the U.S. has

fallen from seventh to fourteenth, and has held steady at thirteenth in quality of roads in particular.

These figures should come as no surprise, as U.S. infrastructure investment has fallen steadily. State and local spending on infrastructure dropped from 3 percent of GDP in 1960 to less than 2 percent in 2014, while GDP grew exponentially.<sup>8</sup> Concurrently, investment in highways by states and localities has declined since the mid-1950s.<sup>9</sup>

Federal funding has similarly declined. The Federal Highway Trust Fund, which serves as a major funding stream for roads and bridges, has been depleted by spending that outpaced fuel tax collections. As a result, approximately \$65 billion from the U.S. Treasury general fund has been transferred to the Highway

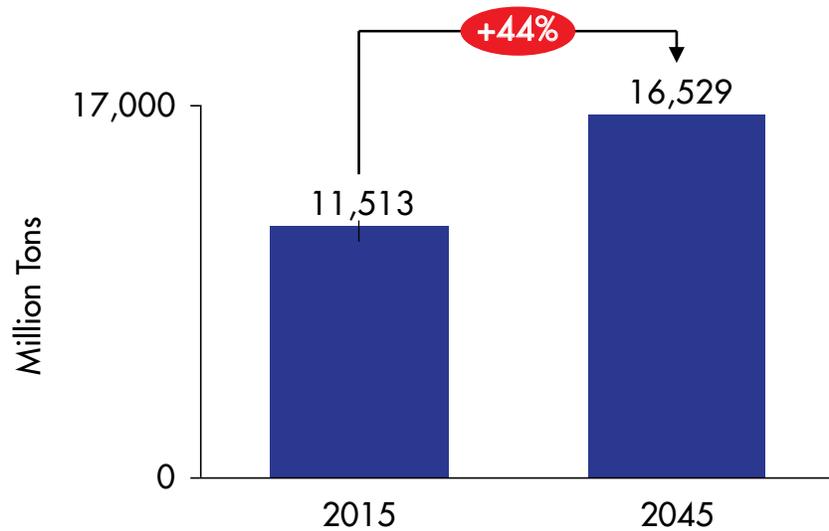
Trust Fund since 2008 to fill funding gaps for ongoing transportation projects.<sup>10</sup> Nonetheless, the existing funding is not sufficient to maintain and improve roads and bridges, as the Federal Highway Administration estimates that "\$170 billion in capital investment would be needed on an annual basis to significantly improve conditions and performance."<sup>11</sup>

The decline has been highlighted at the highest levels of government, but to date there hasn't been significant action. In 2014, the National Economic Council and the President's Council of Economic Advisers produced an economic analysis of transportation infrastructure investment, concluding "there are more than 4 million miles of road, 600,000 bridges, and 3,000 transit providers in the U.S. And yet, over the past 20 years, total federal, state, and local investment in transportation has fallen as a share of GDP – while population, congestion, and maintenance backlogs have increased."<sup>12</sup>

If the state of infrastructure continues to decline, the country will be forced to mitigate the impacts of lost efficiency and the resulting economic consequences. As the Eno Center for Transportation's Robert Puentes notes, unemployment could be reduced "by as much as 1 full percentage point by a sustained \$250 billion annual increase in infrastructure investment." This investment could allow more than 1 million workers find employment every year.<sup>13</sup>

**Fig. 2: Weight Of Freight Transported By Truck Will Increase 44 Percent By 2045**

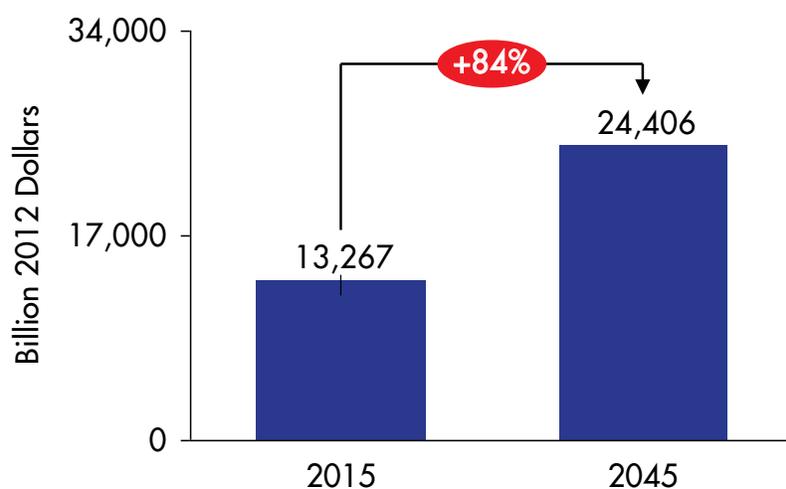
### 30-Year Projection For Weight Of Goods Shipped In The U.S. By Truck



Sources: Bureau of Transportation Statistics, U.S. Department of Transportation; "Freight Analysis Framework," Federal Highway Administration

**Fig. 3: Value Of Freight Transported By Truck Will Increase 84 Percent By 2045**

### 30-Year Projection For Value Of Goods Shipped In The U.S. By Truck

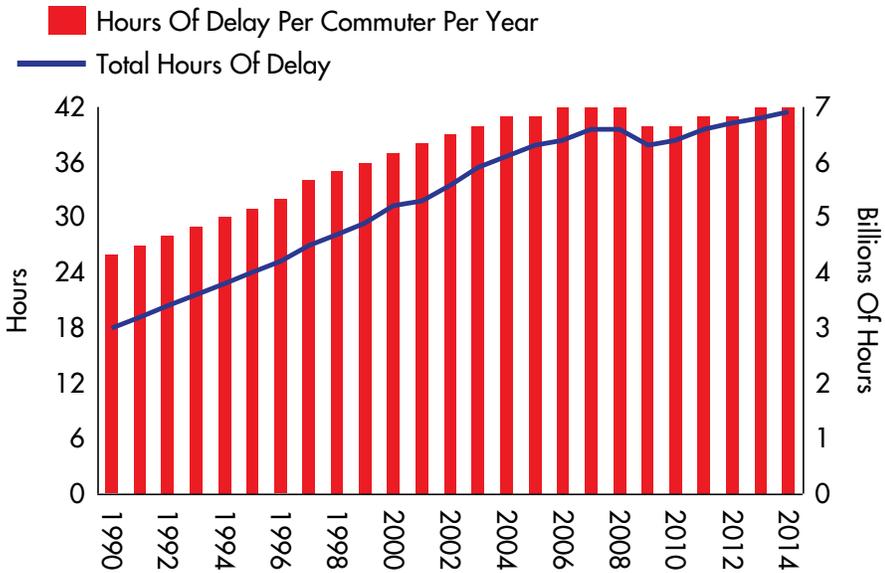


Sources: Bureau of Transportation Statistics, U.S. Department of Transportation; "Freight Analysis Framework," Federal Highway Administration



**Fig. 5: Highway Congestion Has Levelled, But Remains High At An Average Of 42 Hours Per Commuter Per Year**

**Annual Hours Of Highway Traffic Delay**



Source: "2015 Urban Mobility Scorecard," Texas A&M Transportation Institute

because of it.<sup>22</sup>

But we are also shopping and purchasing faster, as the growing e-commerce marketplace enables the 69 percent of Americans who shop online to purchase millions of products at the click of a button. The demand for faster delivery means the U.S. transportation system moves an increasingly massive volume of goods and products every year.

In 2015, the U.S. freight transportation system moved 18.1 billion tons of goods, worth \$19.2 trillion.<sup>23</sup> But that number has not yet peaked, as the tons of goods transported over the next 30 years is projected to grow 40 percent and the value of those goods will increase by 92 percent (See Fig. 7).<sup>24</sup>

This behavior shift also has driven

a change in the way American suppliers and manufacturers operate to match the demand of the 122.5 million households and

**"Federal and state governments must take the same proactive effort to promote a modern transportation system"**

7.5 million domestic businesses that rely on the U.S. transportation system to obtain their goods and materials.<sup>25</sup> Supply-chain programs are moving from an "inventory based 'manufacture-to-supply'" model to a "manufacture-to-order" model. This means more

businesses are relying on the transportation system to rapidly move their supply to meet consumer demand.<sup>26</sup>

In addition to a supply-chain restructuring, this shift has spurred the growth of innovative technologies devoted to increasing efficiency in the transportation sector. Emerging technologies such as vehicle-to-vehicle and vehicle-to-infrastructure communication platforms, autonomous cars, and platooning (a form of autonomous technology that allows trucks to coordinate acceleration and braking), promise to meet consumer demands faster, safer, and with fewer trucks on the road.

As roads become more crowded and shipping becomes more integral to daily life, it is the responsibility of the transportation industry and policymakers to ensure investments and commitments prioritize sustainability, efficiency, and safety for the American consumer. This includes laying the groundwork for, and supporting the development of, innovations that can make a difference on our roads.

**Policy Recommendations**

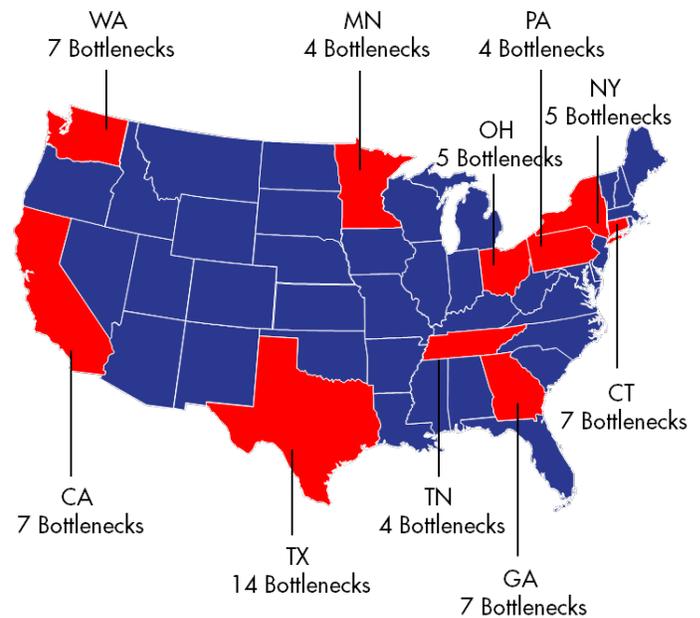
In the pursuit of a modern transportation system that provides efficiency and safety for all, the private sector must be allowed to continue making investments in new technologies, including upgraded fleets. Concurrently, federal and state governments must take the same proactive effort to promote a modern transportation system that embraces

**Fig. 6: Every Year, Congestion Costs The Trucking Industry \$49.6 Billion And 728 Million Lost Hours Of Productivity**

**2017 Top 10 Worst Truck Bottlenecks**

Rank	Location	Average Speed (mph)
1	Atlanta, GA: I-285 at I-85 (North)	38
2	Fort Lee, NJ: I-95 at SR 4	35
3	Chicago, IL: I-290 at I-90/I-94	27
4	Louisville, KY: I-65 at I-64/I-71	39
5	Cincinnati, OH: I-71 at I-75	46
6	Los Angeles, CA: SR 60 at SR 57	43
7	Auburn, WA: SR 18 at SR 167	45
8	Houston, TX: I-45 at US 59	36
9	Atlanta, GA: I-75 at I-285 (North)	44
10	Seattle, WA: I-5 at I-90	35

**States With The Most Bottlenecks In 2017 Top100**



Source: American Transport Research Institute

environmentally-sustainable and safety-enhancing technology, while providing the necessary funding to maintain today's critical highways, roads, and bridges. There are three general areas of opportunity to modernize America's infrastructure: efficiency, sustainability, and driver safeguards.

**1. Boost Efficiency: Expanding The Use Of Twin 33s And Other Technologies**

Expanding the use of Twin 33 foot trailers, is a common-sense solution to increase shipping capacity necessary to serve the growing consumer base while mitigating the environmental effect of adding more trucks to the road.

As Mike Roeth of Carbon War Room explains, "Twin 33 trailers

will allow for more freight hauled per power unit, resulting in greater fuel savings for fleets and less congestion on America's roadways. This is a common sense proposal that will generate real world results." In addition to the direct environmental benefits of fewer trucks on the road, the adoption of Twin 33s will relieve stress on road infrastructure and reduce overall road congestion, enabling a more efficient flow of goods across the country and powering further economic growth.

Safety should always be a top priority, and research clearly finds Twin 33s perform equal to, or better than, current trailer combinations in four critical safety measurements: static rollover threshold, rearward amplification, load transfer ratio, and high speed

transient off-tracking. The former University of Michigan Professor John Woodrooffe puts it clearly; "33-foot-long trailers' extended wheelbases would make them more stable than twin 28s when being pulled by a truck-tractor, especially in turns."

**2. Encourage Sustainability: Support Adoption Of Technology Upgrades And Investment In Renewable Fuels**

To further enable sustainability over the long term, private-sector companies should continue to deploy technology upgrades across their fleets that maximize fuel efficiency and minimize emissions. Modifications such as tire pressure monitoring and auto-shifting transmissions are making

great strides toward increased environmental sustainability.

The adoption of the Department of Transportation and Environmental Protection Agency's Phase II Medium and Heavy Duty Fuel Efficiency Standards will provide additional efficiencies. A study conducted by the Energy Information Administration concluded the industry-wide adoption of Phase II Standards would "reduce diesel consumption by 0.5 million barrels of oil equivalent per day by 2040."<sup>27</sup>

### 3. Foster Innovation: Create Open Regulatory Environment To Encourage Private Sector Development Of Smart Technologies

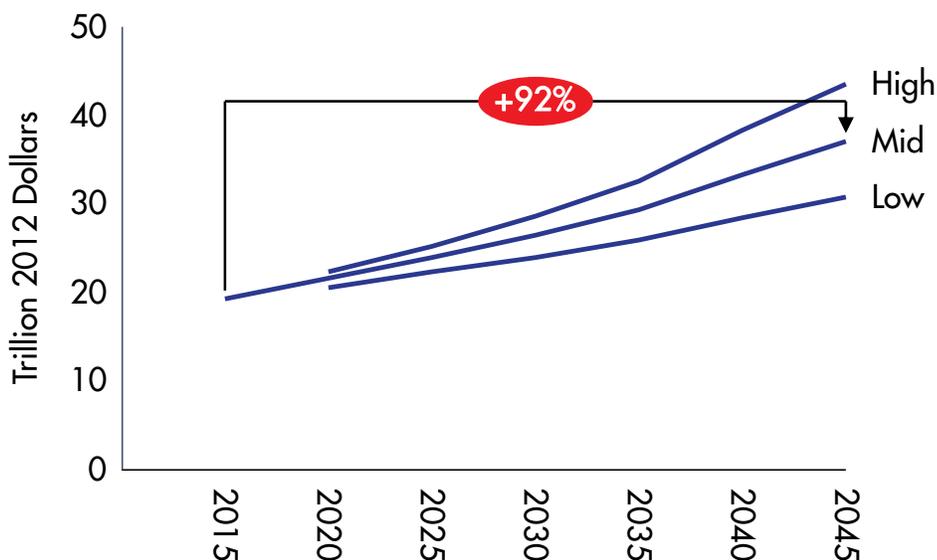
The potential impact of cutting-edge technology on our roads is promising, but it will be impossible if state and federal governments fail to create an environment that fosters the development and testing of these innovations.

The deployment of today's cutting-edge technology, such as lane departure warning systems, would prevent approximately 20 to 25 percent of today's total heavy vehicle accidents, according to the NTSB.<sup>28</sup> Carriers should continue to test and deploy additional safety technologies, such as blind spot monitoring and predictive maintenance systems across their fleet to ensure the safest driving conditions possible.

Additional technologies coming across the horizon have the potential to make a dramatic impact. However, their feasibility and timeline to scale across the industry is unclear. One

Fig. 7: The Value Of Freight Moving On The U.S. Transportation Network Is Projected To Grow 92 Percent By 2045

#### 30-Year Projections Of Value Of Goods Shipped In The United States



Source: U.S. Department of Transportation, Bureau of Transportation Statistics and Federal Highway Administration, Freight Analysis Framework

such technology – platooning – is capable of reducing the fuel consumption of trucks by improving aerodynamics. Research by Sia Partners found platooning can provide a 2 to 8 percent reduction "for the leading vehicle and from 8-13 percent for the following vehicles" corresponding "to a reduction of the emission of CO<sub>2</sub> by 5 to 10 percent" with broad adoption.<sup>29</sup>

Other innovations such as smart infrastructure, or vehicle-to-infrastructure communications systems, require extensive cooperation between the industry and local, state, and federal policymakers, but promise a further reduction of congestion and increase in safety. While it may be tempting to divert resources away from nascent technologies, the basic infrastructure for Smart Road Systems are also fundamentally

necessary for many driver-assist technologies that promise safety improvements on a shorter timeline.

Simply put, the exploration of smart and adaptive vehicle technologies should be prioritized and incorporated in new trucking equipment. From Silicon Valley to Kansas City and beyond, entrepreneurial Americans are working to solve tomorrow's problems today. Their world-changing ideas, such as autonomous driving and truck platooning, must be supported, rather than hindered by unnecessary red tape and government overregulation.

### Looking Forward

Moving forward, the public and private-sectors have a unique window of opportunity to modernize America's transportation

infrastructure. Continued private sector investment in updated safety and efficiency technologies should be complemented by federal and state policymaking that supports transportation funding and technology innovation. Collaboration and sustained commitment to modernization will be key to ensuring a reliable transportation system for American consumers and businesses.

It's easy to perceive the national infrastructure system as a series of potholes that must be filled, but genuine policy solutions must also plan for the needs of tomorrow. Fixing one pothole won't stop another from developing. The only way to create a modern infrastructure tomorrow is by committing to it today.

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