The Interstate Highway System turns 60:

Challenges to Its Ability to Continue to Save Lives, Time and Money

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TRIP
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Founded in 1971, TRIP ® of Washington, DC, is a nonprofit organization that researches, evaluates and distributes economic and technical data on surface transportation issues. TRIP is sponsored by insurance companies, equipment manufacturers, distributors and suppliers; businesses involved in highway and transit engineering and construction; labor unions; and organizations concerned with efficient and safe surface transportation.

Executive Summary

Sixty years ago the nation embarked on its greatest public works project, the construction of the Interstate Highway System. President Dwight D. Eisenhower provided strong support for the building of an Interstate Highway System that would improve traffic safety, reduce travel times and improve the nation's economic productivity.

Serving as the most critical transportation link in the nation's economy, the Interstate Highway System has significantly improved the lives of U.S. residents and visitors. Throughout the nation, the Interstate system allows for high levels of mobility by greatly reducing travel times and providing a significantly higher level of traffic safety than other routes.

But 60 years after President Eisenhower articulated a vision for the nation's transportation system, the U. S. again faces a challenge in modernizing its aging and increasingly congested Interstate highway system. If Americans are to continue to enjoy their current level of personal and commercial mobility on Interstate highways and bridges, the nation will need to make a commitment to identifying a long-term funding source to support a well-maintained Interstate Highway System able to meet the nation's need for additional mobility.

In this report, TRIP looks at the history and benefits of the Interstate Highway System, its current use and condition, and the future needs of the nation's most critical transportation system. Sources of data for the report include the U.S. Department of Transportation (USDOT), the Federal Highway Administration (FHWA), the National Highway Traffic Safety Administration (NHTSA), and the U.S. Census Bureau. State-by-state Interstate data can be found in the Appendix. The major findings of the report include the following.

The Dwight D. Eisenhower National System of Interstate and Defense Highways, which has been called the most ambitious public works project built since the Roman Empire, is the most critical link in the nation's transportation system.

- The Interstate Highway System, which includes 2.5 percent of all roadway lane miles in the U.S., carries 25 percent of all vehicle travel in the nation.

- Since funding of the Interstate system was approved in 1956, annual vehicle miles of travel in the U.S. have increased by 387 percent, from 626 billion miles driven, to approximately three trillion miles driven.

- Since 1956, the number of vehicles in the nation has increased by 300 percent, from 65 million vehicles to 260 million vehicles and the nation's population has increased by 91 percent, from 168 million to 321 million.

The 47,662-mile Interstate Highway System includes 10 transcontinental routes and highways varying in length from 18 miles to more than 3,000 miles.

- The Interstate Highway System includes three east-west transcontinental routes: Interstate 10 from Los Angeles to Jacksonville; Interstate 80 from San Francisco to Teaneck, New Jersey; and Interstate 90 from Seattle to Boston.

- The Interstate system includes seven north-south transcontinental routes: Interstate 5 from San Diego to Blaine, Washington; Interstate 15 from San Diego to Sweetgrass, Montana; Interstate 35 from Laredo, Texas to Duluth, Minnesota; Interstate 55 from New Orleans to Chicago; Interstate 65 from Mobile, Alabama to Gary, Indiana; Interstate 75 from Miami to Sault Ste. Marie, Michigan; and Interstate 95 from Miami to Houlton, Maine.

- The longest Interstate route, excluding three-digit urban routes, is Interstate 90 from Seattle to Boston, which is 3,021 miles in length.

- The shortest Interstate route, excluding three-digit urban routes, is Interstate 97 in Maryland, running 18 miles from Annapolis to Baltimore.

The U.S. Department of Transportation has determined that the nation faces a significant backlog in needed Interstate highway repairs and improvements, and at current investment levels traffic congestion on the nation's Interstate Highway System is likely to increase.

- The current backlog of needed improvements on the nation's Interstate Highway System is estimated by the U.S. Department of Transportation to be $189 billion.

- The backlog on the nation's Interstate Highway System includes $59 billion needed to improve pavement conditions, $30 billion to improve bridges and $100 billion for needed system expansion and enhancement.

- The U.S. DOT report also found that the U.S. is only spending approximately 61 percent of the amount needed annually to make needed repairs and improvements on the Interstate Highway System to keep the system in a state of good repair and provide adequate capacity to meet growing personal and freight mobility needs.

- Annual spending on the nation's Interstate Highway System is estimated to be $20.2 billion, while approximately $33 billion annually is needed to complete Interstate repairs and improvements needed to maintain Interstate highways and bridges and to relieve traffic congestion.

The primary source of revenue for the Interstate Highway System is the federal surface transportation program, which was authorized in 2015 through 2020. The program includes modest funding increases and provides states with greater funding certainty, but falls far short of providing the level of funding needed to meet the nation's highway and transit needs. The program does not have a long-term and sustainable revenue source.

- Signed into law in December 2015, the Fixing America's Surface Transportation (FAST Act), provides modest increases in federal highway and transit spending, allows states greater long-term funding certainty and streamlines the federal project approval process.

- The five-year, $305 billion FAST Act will provide a boost of approximately15 percent in highway funding and an 18 percent boost in transit funding over the duration of the program, which expires in 2020.

- While the modest funding increase and certainty provided by the FAST Act are a step in the right direction, the funding falls far short of the level needed to improve conditions and meet the nation's mobility needs, and fails to deliver a sustainable, long-term source of revenue for the federal Highway Trust Fund.

- In addition to federal motor fuel tax revenues, the FAST Act will be funded by $70 billion in U.S. general funds, which will rely on offsets from several unrelated federal programs including the Strategic Petroleum Reserve, the Federal Reserve and U.S. Customs.

- Revenue collected from the 18.4 cents-per-gallon federal motor fuel tax and the 24.4 cents-per-gallon federal diesel fuel tax are the primary sources of funding for the federal Highway Trust Fund, which distributes funds to state and local governments for highway and bridge repairs as well as other surface transportation improvements, including public transit, pedestrian and bicycling facilities.

- Highway Trust Fund revenues have not been adequate to support federal surface transportation spending since 2008. As a result, Congress has approved seven pieces of legislation transferring a total $143 billion in borrowed or General Fund revenue into the Highway Trust Fund.

- When the FAST Act expires at the end of FY 2020, the Congressional Budget Office projects the average annual shortfall to the federal Highway Trust Fund will grow to $16 billion.

- If Congress decides to provide additional revenues into the federal Highway Trust Fund, a number of technically feasible revenue options have been identified by the American Association of State Highway and Transportation Officials.

Highway congestion is increasing on the Interstate Highway System as travel increases faster than new capacity is added. More than two out of every five miles of the nation's urban Interstates are congested. Travel on the Interstate system surged in 2015 and early 2016.

- Forty-three percent of the nation's urban Interstate highways (8,020 of 18,567 miles) are considered congested because they carry traffic levels that result in significant delays during peak travel hours.

- The ten states with the greatest share of their urban Interstate highways considered congested are California, Maryland, New Jersey, Rhode Island, Delaware, Massachusetts, Hawaii, Connecticut, Florida and Minnesota.

State	Percent Urban Interstates Congested
California	85%
Maryland	75%
New Jersey	73%
Rhode Island	63%
Delaware	63%
Massachusetts	62%
Hawaii	60%
Connecticut	60%
Florida	59%
Minnesota	56%

- Travel on the nation's Interstate highways is increasing at a rate more than double the rate that new lane capacity is being added. From 2000 to 2014, vehicle travel on the Interstates increased by 14 percent and lane miles on the system increased by six percent Data for all states can be found in the Appendix.

- In 2015 vehicle miles of travel on the Interstate Highway System was four percent higher than in 2014 and through the first three months of 2016 travel on the Interstate Highway System was five percent higher than during the first three months of 2015.

- The ten states with the greatest increase in vehicle miles of travel on their Interstate highways from 2000 to 2014 are: Louisiana, Nevada, North Dakota, Colorado, North Carolina, Utah, Montana, Texas, Florida and New Jersey. Data for all states can be found in the Appendix.

State	Increase in Interstate VMT 2000 to 2014
Louisiana	43%
Nevada	43%
North Dakota	40%
Colorado	33%
North Carolina	32%
Utah	30%
Montana	25%
Texas	24%
Florida	21%
New Jersey	21%

- The average annual amount of travel per Interstate lane-mile increased by 11 percent from 2000 to 2014.

- The state with the busiest urban Interstates is California, where the average lane mile of urban Interstate carried 19,424 vehicles per day in 2014. The ten states with the busiest urban Interstates are California, Maryland, Connecticut, Rhode Island, Florida, Virginia, Hawaii, Kentucky, New Jersey and Massachusetts. Data for all states can be found in the Appendix.

State	Urban Interstate Daily Travel Per Lane Mile
California	19,424
Maryland	18,425
Connecticut	15,391
Rhode Island	15,281
Florida	15,088
Virginia	14,714
Hawaii	14,616
Kentucky	14,538
New Jersey	14,498
Massachusetts	14,496

The Interstate Highway System is the backbone of the nation's economy and has played a critical role in improving the country's business productivity. Since 2000, the amount of combination truck travel on Interstates has increased at a rate approximately double the rate of total travel on the system.

- The Interstate system carried 52 percent of all large commercial truck travel in the U.S. in 2014.

- Travel by combination trucks on the Interstate Highway System has increased by 29 percent from 2000 to 2014, more than double the 14 percent rate of growth for all vehicle travel during the same period.

- Every year, $13.9 trillion in goods are shipped from sites in the U.S.

- Seventy-three percent of the goods shipped annually from sites in the U.S. are carried by trucks and another 14 percent are carried by courier services, which use trucks for part of the deliveries.

- The Interstate system has led to significant increases in economic productivity. Improvements in the highway system have allowed businesses to adopt more efficient logistics practices, which reduce costs for producers and consumers.

- The initial construction of much of the Interstate Highway System provided a tremendous boost to business productivity as a result of more efficient goods shipment. Economists have estimated that from the initial phase of Interstate construction in 1956 to 1970, the annual rate of return for every dollar of public investment in highway construction was 54 cents, which meant that investments recovered their costs in two years.

- The completion of the vast majority of the Interstate system by the 1980s and the deregulation of the U.S. trucking industry resulted in a significant improvement in the competitiveness of U.S. business. In fact, the cost of moving freight, as measured by U.S. business logistics costs, dropped from 16 percent of U.S. Gross Domestic Product (GDP) in 1980 to eight percent in 2014.

- The Interstate Highway System has reduced travel times between destinations throughout the U.S. The improved mobility provided by the Interstate Highway System has given Americans greater choices about where they live, work, shop and spend their leisure time.

- Increasing urban traffic congestion may erode some of the logistics advantages that producers and distributors have over competitors as the cost and reliability of shipping goods is negatively affected.

- Travel by combination trucks, which are the large trucks that carry the majority of freight shipped in the U.S., accounted for 11 percent of all vehicle miles of travel on the Interstate Highway System in 2014.

- The ten states with the largest share of 2014 Interstate vehicle miles of travel attributed to combination trucks are: Wyoming, New Mexico, Arkansas, Nebraska, Iowa, North Dakota, Montana, Idaho, Tennessee and South Dakota. Data for all states can be found in the Appendix.

State	Percent Interstate Vehicle Travel by Combination Trucks
Wyoming	33%
New Mexico	28%
Arkansas	23%
Nebraska	22%
Iowa	20%
North Dakota	20%
Montana	20%
Idaho	19%
Tennessee	18%
South Dakota	18%

The Interstate Highway System provides a network of highways with a variety of safety designs that greatly reduce the likelihood of serious crashes. Travel on the nation's Interstate highways is approximately twice as safe as travel on all other roadways.

- The Interstate Highway System, which carried 25 percent of the nation's travel in 2014, accounted for only 12 percent of the nation's traffic fatalities as a result of superior safety features.

- The features that make Interstates safer than other roads include: a separation from other roads and rail lines, a minimum of four-lanes, gentler curves, paved shoulders, median barriers, and rumble strips to warn drivers when they are leaving the roadway.

- Travel on the nation's Interstate highways is approximately twice as safe as travel on all other roadways. The fatality rate per 100 million vehicle miles of travel on the Interstate system in 2014 was 0.54, compared to 1.26 on non-Interstate routes.

- The 10 states with the highest traffic fatality rates in 2014 on their Interstate highways are: New Mexico, Wyoming, Montana, Texas, Mississippi, South Carolina, Arizona, Louisiana, Oklahoma and Alabama. Data for all states can be found in the Appendix.

State	Intertate Fatality Rate	Non-Interstate Fatality Rate
New Mexico	1.26	1.61
Wyoming	1.24	1.75
Montana	1.11	1.74
Texas	1.01	1.61
Mississippi	0.89	1.68
South Carolina	0.82	1.98
Arizona	0.79	1.35
Louisiana	0.77	1.86
Oklahoma	0.75	1.58
Alabama	0.72	1.40

- TRIP estimates that the Interstate Highway System saved 5,359 lives in 2014, based on an estimate of the number of additional fatalities that would have occurred had Interstate traffic been carried by other major roadways, which often have higher traffic fatality rates and may lack the safety features common to Interstate routes.

- Based on TRIP estimates, the 10 states with the most lives saved in 2014 due to the increased traffic safety provided by the Interstate highway are: California, Texas, Florida, Ohio, Pennsylvania, Illinois, Georgia, North Carolina, Tennessee and Kentucky. Data for all states can be found in the Appendix.

State	Lives Saved Annually by Interstate
California	481
Texas	367
Florida	292
Ohio	240
Pennsylvania	239
Illinois	229
Georgia	220
North Carolina	211
Tennessee	197
Kentucky	195

Overall, current pavement and bridge conditions on most of the Interstate system are acceptable, but some deficiencies exist.

- Pavements on 12 (11.6) percent of Interstate highways are in poor or mediocre condition, with three (3.3) percent rated in poor condition and eight (8.3) percent rated in mediocre condition. Another 11 percent of Interstate pavements are in fair condition and the remaining 78 percent are in good condition.

- The ten states with the greatest share of their Interstate highways with pavements in poor or mediocre condition are: Hawaii, California, Nevada, Louisiana, Delaware, Colorado, Wisconsin, New Jersey, Michigan and New York. Data for all states can be found in the Appendix.

State	Interstate Pavement in Poor Condition	Interstate Pavement in Mediocre Condition	Interstate Pavement in Poor and Mediocre Condition
Hawaii	22%	34%	57%
California	11%	19%	30%
Nevada	13%	15%	28%
Louisiana	7%	20%	26%
Delaware	10%	14%	24%
Colorado	6%	16%	22%
Wisconsin	5%	16%	21%
New Jersey	9%	10%	19%
Michigan	6%	11%	18%
New York	8%	10%	17%

- Three percent of the nation's Interstate bridges are rated structurally deficient and 18 percent are rated functionally obsolete.

- A bridge is structurally deficient if there is significant deterioration of the bridge deck, supports or other major components. Bridges that are functionally obsolete no longer meet modern highway design standards, often because of narrow lanes, inadequate clearances or poor alignment.

- The ten states with the greatest share of Interstate bridges that are structurally deficient are: Rhode Island, West Virginia, Wyoming, New York, Connecticut, Michigan, Illinois, Colorado, Massachusetts and Maine. Data for all states can be found in the Appendix.

State	Interstate Bridges Structurally Deficient
Rhode Island	15%
West Virginia	9%
Wyoming	9%
New York	8%
Connecticut	7%
Michigan	7%
Illinois	7%
Colorado	6%
Massachusetts	6%
Maine	5%

The need for a transcontinental highway system in the U.S. was recognized as early as 1919 and an initial Interstate plan was completed in the late 1930s. But, it was not until Congress approved a suitable funding mechanism in 1956 that the Interstate Highway System became a reality.

- In 1919, Lieutenant Dwight D. Eisenhower participated in the U.S. Army's first transcontinental motor convoy, from Washington, DC, to San Francisco. The trip took 62 days to cross the country, largely due to inadequate roads and highways.

- In 1939, the U.S. Bureau of Public Roads released a report recommending that the U.S. build a system of approximately 26,700 miles of transcontinental highways.

- World War II interrupted progress towards the construction of a national Interstate system, but during the war General Eisenhower came to recognize the value of the German Autobahn highway system for national defense.

- In 1944, Congress authorized the U.S. Bureau of Public Roads to designate 40,000 miles of Interstate highways, but did not identify a source of funding.

- In 1954, President Eisenhower appointed a committee to draft a proposal to fund a national system of Interstate Highways. The initial proposal, subsequently dismissed by Congress, called for financing a national Interstate system through bond financing.

Nationwide construction of the Interstate Highway System began in 1956 following the approval of the Federal-Aid Highway Act of 1956. Some segments of urban and regional highways built prior to 1956 were later incorporated into the Interstate Highway System.

- The Federal-Aid Highway Act of 1956, signed into law by President Dwight Eisenhower on June 29, 1956, called for the construction of a 41,000 mile system of Interstate highways. The Act called for the Interstates to be paid for by taxes on motorists, such as the federal motor fuel tax, with the federal government paying 90 percent of the initial construction costs.

- The federal motor fuel tax was set at three cents-per-gallon in 1956 and is now 18.4 cents-per-gallon.

- Revenue collected from the 18.4 cents-per-gallon federal motor fuel tax and the 24.4 cents-per-gallon federal diesel fuel tax are the primary sources of funding for the federal Highway Trust Fund, which distributes funds to state and local governments for highway and bridge repairs as well as other surface transportation improvements, including public transit, pedestrian and bicycling facilities.

- Approximately 2,000 miles of highways built prior to 1956, including the Pennsylvania Turnpike and the New York Thruway, were incorporated into the Interstate system.

- The first significant section of non-urban highway built in the U.S. is the approximately 160-mile section of the Pennsylvania Turnpike from Irwin to Carlisle. This section of highway opened in 1940 and was later incorporated into the Interstate system.

- The first construction contracts awarded under the provisions of the 1956 Interstate legislation were in August, 1956 in Missouri for portions of Interstate 44 in Laclede County and a portion of Interstate 70 in St. Charles County.

- The first section of Interstate highway to be constructed under the provisions of the Federal -Aid Highway Act of 1956 was for a portion of Interstate 70 in Northeast Kansas, which was completed in November, 1956.

- The majority of the nation's Interstate system was completed by 1986, when 92 percent of the Interstate system's current length and 86 percent of its current lane miles were complete. By 1996, 98 percent of the Interstate system's current length and 96 percent of its current lane miles were complete.

Introduction

Stretching from South Florida to the Canadian border in Maine, straddling the Puget Sound region of Washington State and reaching the Mexican border south of San Diego, the Interstate Highway System connects the United States, providing its citizens and visitors with an unrivaled level of access.

The Dwight D. Eisenhower National System of Interstate and Defense Highways has been called the most ambitious public works project built since the age of the Roman Empire and is literally the backbone of America's economy.

Initially conceived in 1939, significant construction of the Interstate system did not start until 1956 when Congress approved the financing of today's Interstate system, largely through collection of the federal motor fuel tax and other taxes on highway users.

With three east-west transcontinental routes and seven north-south transcontinental routes, the Interstate Highway System is the most critical element of the nation's transportation system. Sixty years after construction of the Interstate System first started, this network of highways has become the most important set of corridors linking people and businesses throughout the nation. Today, the Interstate Highway System continues to provide Americans with economic growth, improved traffic safety and convenient access, while also playing a role in the nation's defense.

This report looks at the benefits, history and impact of the Interstate Highway System, its current use and condition, and the future needs of the nation's most critical transportation system. Just as 60 years ago, when the nation's leaders made critical

decisions on the future of the nation's highway system, today's political leaders face the need to insure that the safety and reliability of the Interstate system is maintained by investing adequately and providing a reliable funding source to insure that needed repairs and improvements are made to the Interstate Highway System to meet the nation's growing personal and commercial mobility needs.

Development of the U.S. Interstate System

In 1919, Lieutenant Dwight D. Eisenhower participated in the U.S. Army's first transcontinental motor convoy, from Washington, DC, to San Francisco. During the 62 days it took to cross the country, the convoy experienced numerous difficulties, including roads that were muddy, narrow or otherwise inadequate, and bridges that often could not support the vehicles in the convoy.

A generation later, General Eisenhower saw firsthand how an efficient, effective highway transportation system benefited a nation, when he noted that the German Autobahn network, opened in 1935, provided a significant military advantage to Germany.

The United States also began looking at the feasibility of constructing a series of interregional highways in the late 1930s. In 1938 Congress directed the then Bureau of Public Roads (BPR) to prepare a study on the possibility of building a national system of toll highways. The resulting 1939 BPR report concluded that it would be impossible to finance a national system of highways strictly through charging tolls, but did recommend that the U.S. build a system of approximately 26,700 miles of transcontinental highways.

The BPR report also called for many of the design elements found on modern Interstate highways, including limited access, which separates highway traffic from other traffic and from trains. The report also suggested that the nation's highways should connect with the center of large cities, should include beltways around large urban areas and should bypass small towns.

Further attempts to develop a national highway system were interrupted by World War II. But as the Allies gained the upper hand in the war, Congress started to turn its attention to post-war challenges, including consideration of a modern highway system to support the nation's growing economy and improve safety and mobility. The Federal-Aid Highway Act of 1944 authorized the BPR to designate a system of approximately 40,000 miles of Interstate highways, which proved very similar to the routes approved ultimately as the national Interstate system. But the 1944 highway bill did not specify any additional funds for construction of the highways, other than the small amount of funds then made available by the federal government for highway construction.

The 1944 Highway Act identified the need for a national system of interconnected highways, but left out a key piece of the puzzle – how to fund a uniformly designed national highway system, which would have significant differences in construction costs and traffic volume, depending on location. Even without significant federal funding available, cities and states began to move forward on their own, with some additional highway networks being built or planned in current Interstate corridors, under various financing mechanisms. These early highway projects included toll highways such as the Pennsylvania Turnpike and the New York Thruway and early urban highways including the Los Angeles Freeway System and the Detroit Expressway System. But, for most

motorists and businesses, the inadequate roadway system of the late 1940s and early 1950s contributed to growing human and economic losses, as cars and trucks jostled for position on the nation's inadequate, narrow and winding roads and streets.

In 1954 President Eisenhower appointed a committee to draft a proposal to fund a national system of Interstate Highways. Eisenhower noted that the nation's obsolete highway system penalized Americans through increased traffic deaths, the waste of time caused by traffic delays, the increased cost of freight movement and the inability of the nation's highways to meet the mobility demands that would be caused by a regional catastrophe or national defense emergency.

The initial plan prepared for President Eisenhower called for funding a national Interstate System through bond financing, but Congress dismissed the use of bond revenue as the primary source of Interstate highway financing. In 1956, Congress overwhelmingly approved the construction of a national Interstate Highway System when the financing was changed to a pay-as-you-go format that would collect a series of user fees -- most notably a three cents-per-gallon tax on motor fuel – into a national Highway Trust Fund.

The Federal-Aid Highway Act of 1956 called for the construction of a 41,000-mile Interstate Highway System, which was to be completed by 1970 at a cost of approximately $27 billion. The design of the system was very similar to the initial 1944 plan, which called for connecting large urban areas, including routing highways into central cities, largely at the request of mayors and other local politicians who feared that their communities would be left behind without modern highway access. The Interstate system was designated to incorporate approximately 2,000 miles of existing highways,

including the Pennsylvania Turnpike and the New York Thruway. The highways were to be built to high design standards that would reduce traffic deaths and increase the amount and speed of traffic that could be carried. These design standards included: full access control to limit entrance and exit to on and off ramps, a minimum of four lanes, medians to separate oncoming lanes, and moderate curves.

Construction of the Interstate System

Following the signing of the Federal-Aid Highway Act of 1956 by President Eisenhower on June 29, 1956, the nation moved quickly to orient its highway program toward the enormous task of planning and constructing the nation's eventual 46,572-mile Interstate system.

The first construction contracts awarded under the provisions of the 1956 Interstate legislation were in August, 1956 in Missouri for portions of Interstate 44 in Laclede County and a portion of Interstate 70 in St. Charles County.[1]

The first section of Interstate highway on which construction was completed under the provisions of the Federal -Aid Highway Act of 1956 was a portion of Interstate 70 in Northeast Kansas, which was completed in November, 1956.[2]

The majority of the nation's Interstate system was completed by 1986, when 92 percent of the Interstate system's current length and 86 percent of lane miles were complete. By 1996, 98 percent of the Interstate system's current length and 96 percent of lane miles were complete.[3]

Funding of the Interstate System

The primary source of revenue for the Interstate Highway System is the current federal surface transportation program, which was authorized in 2015 through 2020. The program includes modest funding increases and provides states with greater funding certainty, but falls far short of providing the level of funding needed to meet the nation's highway and transit needs. The bill does not include a long-term and sustainable revenue source.

Signed into law in December 2015, the Fixing America's Surface Transportation (FAST Act), provides modest increases in federal highway and transit spending, allows states greater long-term funding certainty and streamlines the federal project approval process.

The five-year, $305 billion FAST Act will provide a boost of approximately 15 percent in highway funding and an 18 percent boost in transit funding over the duration of the program, which expires in 2020.[4]

In addition to federal motor fuel tax revenues, the FAST Act will also be funded by $70 billion in U.S. general funds, which will rely on offsets from several unrelated federal programs including the Strategic Petroleum Reserve, the Federal Reserve and U.S. Customs.[5]

Revenue collected from the 18.4 cents-per-gallon federal motor fuel tax and the 24.4 cents-per-gallon federal diesel fuel tax are the primary sources of funding for the federal Highway Trust Fund, which distributes funds to state and local governments for

highway and bridge repairs as well as other surface transportation improvements, including public transit, pedestrian and bicycling facilities.

Highway Trust Fund revenues have not been adequate to support federal surface transportation spending. As a result Congress has approved seven pieces of legislation since 2008 transferring a total $143 billion in borrowed or General Fund revenue into the Highway Trust Fund.[6]

When the FAST Act expires at the end of FY 2020, the Congressional Budget Office projects the average annual shortfall to the federal Highway Trust Fund will grow to $16 billion.[7]

If Congress decides to provide additional revenues into the federal Highway Trust Fund, a number of technically feasible revenue options have been identified by the American Association of State Highway and Transportation Officials.

The Interstate Highway System

Today, the 47,662-mile Interstate Highway System includes 10 transcontinental routes and highways varying in length from 18 miles to more than 3,000 miles. The Interstate Highway System includes three east-west transcontinental routes: Interstate 10 from Los Angeles to Jacksonville; Interstate 80 from San Francisco to Teaneck, New Jersey; and Interstate 90 from Seattle to Boston.

The Interstate Highway System also includes seven north-south transcontinental routes: Interstate 5 from San Diego to Blaine, Washington; Interstate 15 from San Diego to Sweetgrass, Montana; Interstate 35 from Laredo, Texas to Duluth, Minnesota;

Interstate 55 from New Orleans to Chicago; Interstate 65 from Mobile, Alabama to Gary, Indiana; Interstate 75 from Miami to Sault Ste. Marie, Michigan; and Interstate 95 from Miami to Houlton, Maine.

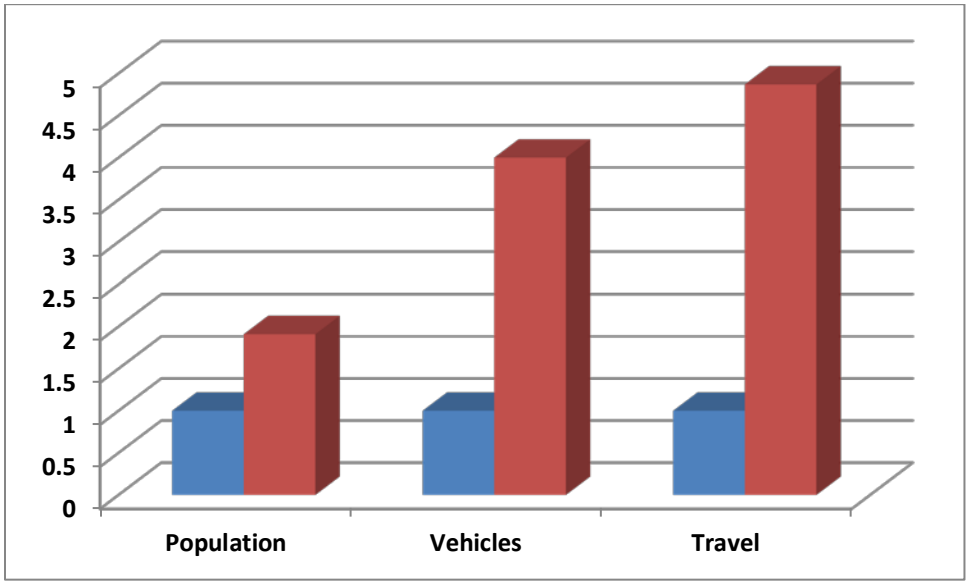
The longest Interstate route, excluding three-digit urban routes, is Interstate 90 from Seattle to Boston, which is 3,021 miles in length. The shortest Interstate route, excluding three-digit urban routes, is Interstate 97 in Maryland, which runs 18 miles from Annapolis to Baltimore.

The Interstate route that traverses the most states is Interstate 95, which passes through 15 states: Florida, Georgia, South Carolina, North Carolina, Virginia, Maryland, Delaware, Pennsylvania, New Jersey, New York, Connecticut, Rhode Island, Massachusetts, New Hampshire and Maine.

Trends in Interstate Travel and Capacity

Since the beginning of the Interstate era 60 years ago, the U.S. has seen enormous increases in population, the number of motor vehicles and the amount of vehicle travel. From 1956 to 2015, the nation's population increased by 91 percent from 168 million to 321 million.[8] During that same time, the number of motor vehicles increased by 300 percent from 65 million to 260 million and vehicle travel increased by 387 percent, from 626 billion miles driven annually to approximately three trillion miles driven annually.[9]

Chart 1. Increase from 1956 to current day in Population, Vehicles and Travel in the U.S. (1 = 1956 level)



Source: TRIP analysis of U.S. Census and Federal Highway Administration data

The Interstate Highway System remains the most critical component of the nation's transportation system. While Interstate highways account for only 2.5 percent of all lane miles of roads in the U.S., they carry 25 percent of all travel in the nation.[10]

Travel on Interstate highways is growing at a rate double the rate that new lane capacity is being added. From 2000 to 2014, vehicle travel on Interstate highways increased by 14 percent from 661 billion miles traveled annually to 751 billion miles.[11] Yet, during the same period, total lanes miles on the nation's Interstate system increased by six percent, from 208,499 miles to 221,229 miles.[12] The result of the increase in travel on the nation's Interstate system without a corresponding increase in Interstate lane mileage, is that these highways are carrying more traffic than in the past. In fact, the average annual amount of travel per Interstate lane-mile has increased by 11 percent from 2000 to 2014.[13]

The ten states with the greatest increase in vehicle miles of travel on their Interstate highways from 2000 to 2014 are: Louisiana, Nevada, North Dakota, Colorado, North Carolina, Utah, Montana, Texas, Florida and New Jersey. Data for all 50 states can be found in the Appendix.

Chart 2. States with Largest Increase in Vehicle Travel from 2000 to 2014.

State	Increase in Interstate VMT 2000 to 2014
Louisiana	43%
Nevada	43%
North Dakota	40%
Colorado	33%
North Carolina	32%
Utah	30%
Montana	25%
Texas	24%
Florida	21%
New Jersey	21%

Source: TRIP analysis of FHWA data

Travel on the Interstate Highway System has grown significantly over the last two years. In 2015 vehicle miles of travel on the Interstate Highway System was four percent higher than in 2014 and through the first three months of 2016 travel on the Interstate Highway System was five percent higher than during the first three months of 2015.[14]

Traffic Congestion on the Interstates

The Interstate Highway System was initially designed to provide transportation between the nation's urban areas and to support national defense. But, as Interstate highways were ultimately built around and through many cities, they became the nation's most critical transportation corridors both between and often within urban areas.

The continued increase in Interstate highway travel has resulted in an increase in traffic congestion levels. Forty-three percent of the nation's urban Interstates (8,020 of 18,567 miles) are considered congested because they carry traffic levels that result in delays during peak travel hours.[15] The ten states with the greatest share of congested urban interstates are California, Maryland, New Jersey, Rhode Island, Delaware, Massachusetts, Hawaii, Connecticut, Florida and Minnesota.[16] Data for all states can be found in the Appendix.

Chart 3. States with Greatest Share of Urban Interstates That Experience Congestion During Peak Hours, 2014.

State	Percent Urban Interstates Congested
California	85%
Maryland	75%
New Jersey	73%
Rhode Island	63%
Delaware	63%
Massachusetts	62%
Hawaii	60%
Connecticut	60%
Florida	59%
Minnesota	56%

Source: TRIP analysis of FHWA data

The state with the busiest urban Interstates is California, where the average lane mile of urban Interstate carried 19,424 vehicles per day in 2014.[17] The ten states with the busiest urban Interstates are California, Maryland, Connecticut, Rhode Island, Florida, Virginia, Hawaii, Kentucky, New Jersey and Massachusetts.[18] Data for all states can be found in the Appendix.

Chart 4. States with Greatest Daily Travel Per-Lane-Mile on Urban Interstates, 2014.

State	Urban Interstate Daily Travel Per Lane Mile
California	19,424
Maryland	18,425
Connecticut	15,391
Rhode Island	15,281
Florida	15,088
Virginia	14,714
Hawaii	14,616
Kentucky	14,538
New Jersey	14,498
Massachusetts	14,496

Source: TRIP analysis of FHWA data

Freight Shipment by Large Trucks on the Interstates

Every year, $13.9 trillion in goods are shipped from sites in the U.S., to domestic and international destinations.[19] Seventy-three percent of the goods shipped annually from sites in the U.S. are carried by trucks and another 14 percent are carried by courier services, which use trucks for part of their deliveries.[20]

The Interstate Highway System is the nation's most critical set of highways for goods shipment. Interstate highways carried 52 percent of all combination truck travel, measured by vehicle miles of travel in the U.S. in 2014.[21]

Travel by combination trucks, which are the large trucks that carry the majority of freight shipped in the U.S., accounted for 11 percent of all vehicle miles of travel on the Interstate Highway System in 2014.[22] The ten states with the largest share of 2014 Interstate vehicle miles of travel attributed to combination trucks are: Wyoming, New Mexico, Arkansas, Nebraska, Iowa, North Dakota, Montana, Idaho, Tennessee and South Dakota.[23] Data for all states can be found in the Appendix.

Chart 5. States with Largest Share of Vehicle Miles of Travel Attributed to Combination Trucks (2014)

State	Percent Interstate Vehicle Travel by Combination Trucks
Wyoming	33%
New Mexico	28%
Arkansas	23%
Nebraska	22%
Iowa	20%
North Dakota	20%
Montana	20%
Idaho	19%
Tennessee	18%
South Dakota	18%

Source: TRIP analysis of FHWA data

Traffic Safety on Interstate Highways

Perhaps the most significant benefit of the Interstate system is that it has greatly improved traffic safety throughout the U.S. by providing travelers with a network of highways with a variety of safety designs that significantly reduce the likelihood of serious accidents.

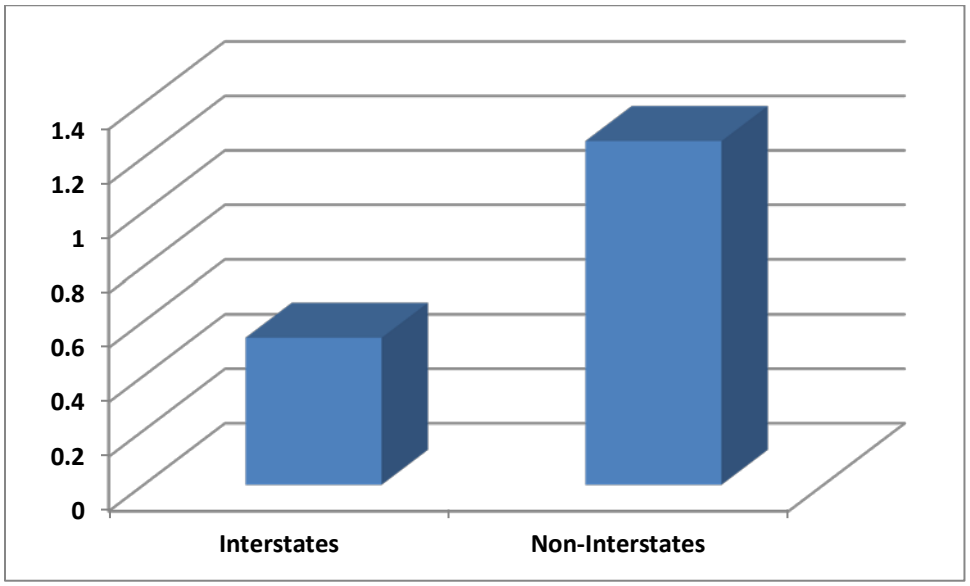
The safety features that are required on Interstates include a separation from other roads, streets and rail lines; access limited to on and off ramps; a minimum of four-lanes to prevent the need to enter oncoming lanes for passing; and gentler curves. Most Interstate highways also have paved shoulders, and many have median barriers to avoid cross-over crashes, and rumble strips to warn drivers if they are leaving the roadway.

The result of the high level of safety design standards on the Interstate is that travel on the nation's Interstate highways is more than twice as safe as travel on all other roads and highways.

The Interstate Highway System, which carried 25 percent of the nation's travel in 2014, accounted for only 12 percent of the nation's traffic fatalities as a result of superior safety features.[24] There were 4,084 traffic fatalities on the nation's Interstate highways in 2014 – 12 percent of the 32,675 traffic fatalities that occurred in the U.S. in 2014.[25]

The traffic fatality rate per 100 million vehicle miles of travel on Interstate highways was 0.54 in 2014.[26] The fatality rate per 100 million vehicle miles of travel in 2014 on non-Interstate routes was 1.26 – more than double the rate on the nation's Interstates. [27]

Chart 6. Fatality rate per 100 Million Vehicle Miles of Travel for Interstate and Non-Interstate roadways, 2014



Source: TRIP analysis of FHWA data

The 10 states with the highest traffic fatality rates on their Interstate highways in 2014 are: New Mexico, Wyoming, Montana, Texas, Mississippi, South Carolina, Arizona, Louisiana, Oklahoma and Alabama.[28] Data for all states can be found in the Appendix.

Chart 7. States with Highest Traffic Fatality Rate per 100 Million Vehicle Miles of Travel on its Interstate System and Traffic Fatality Rate on non-Interstate roadways (2014).

State	Intertate Fatality Rate	Non-Interstate Fatality Rate
New Mexico	1.26	1.61
Wyoming	1.24	1.75
Montana	1.11	1.74
Texas	1.01	1.61
Mississippi	0.89	1.68
South Carolina	0.82	1.98
Arizona	0.79	1.35
Louisiana	0.77	1.86
Oklahoma	0.75	1.58
Alabama	0.72	1.40

Source: TRIP analysis of FHWA and NHTSA data.

Pavement Conditions on the Interstate System

The lifecycle of highway pavements is greatly affected by a transportation agency's ability to perform timely maintenance and upgrades to ensure that surfaces remain smooth as long as possible. The pavement condition of major roads is evaluated and classified as being in poor, mediocre, fair or good condition. A desirable goal for state and local organizations that are responsible for road maintenance is to keep 75 percent of major roads in good condition.[29]

In 2014, pavement on 12 (11.6) percent of the nation's Interstate highways was rated in poor or mediocre condition, with three (3.3) percent rated poor and eight (8.3) percent rated mediocre.[30] Roads rated poor often have pavements that are cracked or

broken. In some cases, poor roads can be resurfaced, but often are too deteriorated and must be reconstructed. Roads rated in mediocre condition show signs of significant wear and may also have some visible pavement distress. Most pavements in mediocre condition can be repaired by resurfacing, but some may need more extensive reconstruction to return them to good condition. An additional 11 percent of Interstate pavements are rated in fair condition and the remaining 78 percent of Interstate pavements are rated in good condition.[31]

Pavement deterioration is caused by a combination of traffic, moisture and climate. Moisture often works its way into road surfaces and the materials that form the road's foundation. Road surfaces at intersections are even more prone to deterioration because the slow-moving or standing loads occurring at these sites subject the pavement to higher levels of stress. It is critical that roads are fixed before they require major repairs because reconstructing roads costs approximately four times more than resurfacing them.[32]

The ten states with the greatest share of their Interstate highways with pavements in poor or mediocre condition are: Hawaii, California, Nevada, Louisiana, Delaware, Colorado, Wisconsin, New Jersey, Michigan and New York. Data for all 50 states can be found in the Appendix.

Chart 8. States with greatest share of Interstate highways with pavements in poor or mediocre condition (2014).

State	Interstate Pavement in Poor Condition	Interstate Pavement in Mediocre Condition	Interstate Pavement in Poor and Mediocre Condition
Hawaii	22%	34%	57%
California	11%	19%	30%
Nevada	13%	15%	28%
Louisiana	7%	20%	26%
Delaware	10%	14%	24%
Colorado	6%	16%	22%
Wisconsin	5%	16%	21%
New Jersey	9%	10%	19%
Michigan	6%	11%	18%
New York	8%	10%	17%

Source: TRIP analysis of FHWA data

Interstate Bridge Conditions

Of the 56,448 bridges on the U.S. Interstate system, three percent are rated as structurally deficient and 18 percent are rated as functionally obsolete.[33]

Bridges that are rated structurally deficient show significant signs of deterioration as a result of use and exposure. The FHWA defines a structurally deficient bridge as one that requires immediate rehabilitation to remain open, is restricted to carrying lighter-weight vehicles or is closed. Bridges that are rated as functionally obsolete do not meet current design standards, which may result in reduced traffic safety, compared to a bridge that meets current standards. Functionally obsolete bridges are defined by the FHWA as those that have deck geometry, load carrying capacity, clearance or approach roadway alignment that no longer meet the criteria for the system of which the bridge is a part.

The ten states with the greatest share of structurally deficient Interstate bridges are: Rhode Island, West Virginia, Wyoming, New York, Connecticut, Michigan, Illinois, Colorado, Massachusetts and Maine. Data for all states can be found in the Appendix.

Chart 9. States with greatest share of Interstate bridges rated structurally deficient (2015).

State	Interstate Bridges Structurally Deficient
Rhode Island	15%
West Virginia	9%
Wyoming	9%
New York	8%
Connecticut	7%
Michigan	7%
Illinois	7%
Colorado	6%
Massachusetts	6%
Maine	5%

Source: TRIP analysis of National Bridge Inventory data

While most Interstate bridges are generally in acceptable condition, a large number of these bridges are reaching an age when they will require significant repairs, and in some cases replacement. The average lifespan of a bridge is 50 years.[34] Older bridges often need significant repairs or rehabilitation or may need to be replaced to continue to provide adequate service.

Economic Benefits of the Interstate System

The construction of the Interstate Highway System has had a profound impact on the nation's development, affecting the quality of life of Americans in numerous ways including increased safety, expanded lifestyle choices and an enhanced standard of living.

By greatly increasing the number of areas that are within a reasonable driving distance, the Interstate system has significantly increased access to jobs, housing, recreation, healthcare, shopping and other amenities.

Similarly, the construction of the Interstate Highway System has benefited the nation's economy by reducing the costs of and increasing the speed of goods movement. The ability to cheaply and quickly ship products to or from domestic and international sites has provided lower costs and greater selection to consumers, while opening up new markets to U.S. businesses. The completion of the vast majority of the Interstate system by the 1980s and the deregulation of the U.S. trucking industry resulted in a significant improvement in the competitiveness of U.S. business. In fact, the cost of moving freight, as measured by U.S. business logistics costs, dropped from 16 percent of U.S. Gross Domestic Product (GDP) in 1980 to eight percent in 2014.[35]

The initial construction of much of the Interstate system provided a tremendous boost to business productivity as a result of more efficient goods shipment. Economists have estimated that through the initial phase of Interstate construction to 1970, the annual rate of return for every dollar of public investment in highway construction was 54 cents, which meant that investments recovered their costs in two years.

The continued tremendous increase in freight deliveries over recent years has been partly fueled by improved communications and the need for greater economic competitiveness. Improved communications provided by the Internet are integrating producers, wholesalers, retailers and consumers. Businesses have responded to improved communications and the necessity to cut costs with a variety of innovations, including just-in-time delivery, increased small package delivery, demand-side inventory management and e-commerce.

The result of these changes has been a significant improvement in logistics efficiency as firms move away from a push-style distribution system, which relies on large-scale warehousing of materials, to a pull-style distribution system, which relies on smaller, more strategic movement of goods. These improvements have made mobile inventories the norm, resulting in the nation's trucks literally becoming rolling warehouses.

Lives Saved by Interstate Highway System

Because it carries significant volumes of traffic on roadways with higher safety standards and lower traffic fatality rates, the Interstate Highway System saves thousands of lives annually. TRIP estimates that the Interstate Highway System saved 5,359 lives in 2014.[36] This estimate is based on a comparison of the annual fatality rate on the nation's Interstate highways compared to the fatality rate each year on other major roads in the state. Interstate safety benefits were estimated by calculating the additional fatalities that would have occurred each year if the travel that occurred on Interstate highways had

instead been carried by other major roads, many of which often lack some of the safety features found on Interstate highways and have a significantly higher traffic fatality rate.

The 10 states that TRIP estimates had the most lives saved in 2014 due to the increased traffic safety provided by the Interstate Highway System are: California, Texas, Florida, Ohio, Pennsylvania, Illinois, Georgia, North Carolina, Tennessee and Kentucky.[37] Data for all states can be found in the Appendix.

Chart 10: States With Greatest Number of Lives Saved in 2014 Due to The Improved Traffic Safety Provided by the Interstate Highway System.

State	Lives Saved Annually by Interstate
California	481
Texas	367
Florida	292
Ohio	240
Pennsylvania	239
Illinois	229
Georgia	220
North Carolina	211
Tennessee	197
Kentucky	195

Source: TRIP analysis of FHWA data

Meeting Future Interstate Travel Needs

The U.S. faces a significant challenge in maintaining and rebuilding its aging Interstate Highway System and providing additional lane capacity to meet growing travel demand.

The most recent biennial U.S. Department of Transportation analysis of the condition of the nation's surface transportation system found that the nation faces a significant backlog in needed improvements to the Interstate Highway System.

The U.S. Department of Transportation, in its report "Status of the Nation's Highways, Bridges and Transit: 2013 Conditions and Performance," determined that the current backlog in needed improvements on the nation's Interstate Highway System is estimated to be $189 billion dollars.[38] The backlog on the nation's Interstate Highway System includes $59 billion needed to improve pavement conditions, $30 billion to improve bridges and $100 billion for needed system expansion and enhancement.[39]

The U.S. DOT report also found that the nation is only spending approximately 61 percent of the amount needed annually to make needed repairs and improvements on the Interstate Highway System to keep the system in a state of good repair and provide adequate capacity to meet the nation's growing personal and freight mobility needs.[40]

Annual spending on the nation's Interstate Highway System is estimated to be $20.2 billion, while approximately $33 billion is needed annually to complete Interstate repairs and improvements needed to maintain Interstate highways and bridges and to relieve traffic congestion.[41]

Conclusion

Sixty years after President Eisenhower articulated a vision for the nation's 20th Century transportation system, the U. S. again faces a challenge in modernizing its system of aging, increasingly congested Interstate highways. If Americans are to

continue to enjoy their current level of mobility on Interstate highways and bridges, the nation will need to make a commitment to providing the public with a 21st Century highway system.

Today, the U.S. continues to reap tremendous benefits from the nation's most critical transportation network. The Interstate Highway System continues to save Americans time, lives and money while playing a critical role in supporting economic growth and enhancing the lifestyle choices of the nation's residents and visitors. The safe, reliable and timely mobility provided by Interstate highways has contributed to quality of life and is integral to the American economy.

Prior to the approval to the funding of the Interstate system, President Eisenhower noted that inadequate highways resulted in lost time due to traffic delays, reduced economic productivity and reduced traffic safety.

Today, the U.S. faces similar challenges, with growing traffic congestion, increasing car and truck travel, and aging road surfaces and bridges that will soon need significant repairs and rehabilitation.

As Americans look back on the many benefits that the Interstate Highway System has provided the nation, they must also look ahead to meeting the challenge of providing a modern Interstate Highway System that will continue to enhance the quality of life of today's and future generations.

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