

WEST VIRGINIA TRANSPORTATION BY THE NUMBERS:

Meeting the State's Need for Safe, Smooth and
Efficient Mobility

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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

Ten Key Transportation Numbers in West Virginia

\$1.4 billion	Driving on deficient roads costs West Virginia motorists a total of \$1.4 billion annually in the form of additional vehicle operating costs (VOC), congestion-related delays and traffic crashes.
\$647	TRIP estimates that driving on rough roads costs the average West Virginia motorists an average of \$647 annually in extra vehicle operating costs. Costs include accelerated vehicle depreciation, additional repair costs, and increased fuel consumption and tire wear.
1,548 310	A total of 1,548 people were killed in West Virginia traffic crashes from 2011 to 2015, an average of 310 fatalities annually.
1.35	West Virginia's overall traffic fatality rate of 1.35 fatalities per 100 million vehicle miles of travel in 2015 was significantly higher than the national average of 1.13.
3X	The fatality rate on West Virginia's rural roads is nearly three times higher than the fatality rate on all other roads in the state (2.24 fatalities per 100 million VMT vs. 0.81).
29%	Statewide, 29 percent of West Virginia's major roads are in poor condition. Fifty-five percent are in mediocre or fair condition and the remaining 17 percent are in good condition.
\$119 Billion	Annually, \$119 billion in goods are shipped to and from sites in West Virginia, mostly by truck.
17% 5th	A total of 17 percent of West Virginia bridges show significant deterioration and are rated as structurally deficient. West Virginia ranks 5th nationally in its share of bridges rated structurally deficient. This is up from 2015 when 15% percent were structurally deficient – the 8 th highest share in the U.S. at the time.
16%	From 2000 to 2015, West Virginia's gross domestic product, a measure of the state's economic output, increased by 16 percent, when adjusted for inflation. U.S. GDP increased 27 percent during this time.
\$1.00 = \$5.20	The Federal Highway Administration estimates that each dollar spent on road, highway and bridge improvements results in an average benefit of \$5.20 in the form of reduced vehicle maintenance costs, reduced delays, reduced fuel consumption, improved safety, reduced road and bridge maintenance costs, and reduced emissions as a result of improved traffic flow.

Executive Summary

Nine years after the nation suffered a significant economic downturn, West Virginia's economy continues to struggle. The rate of economic growth in West Virginia, which will be greatly impacted by the reliability and condition of the state's transportation system, continues to have a significant impact on quality of life in the Mountain State.

An efficient, safe and well-maintained transportation system provides economic and social benefits by affording individuals access to employment, housing, healthcare, education, goods and services, recreation, entertainment, family, and social activities. It also provides businesses with access to suppliers, markets and employees, all critical to a business' level of productivity and ability to expand. Reduced accessibility and mobility - as a result of traffic congestion, a lack of adequate capacity, or deteriorated roads, highways, bridges and transit facilities - diminishes a region's quality of life by reducing economic productivity and limiting opportunities for economic, health or social transactions and activities.

With an economy based largely on natural resource extraction, manufacturing, agriculture, biotechnology and tourism, the quality of West Virginia's transportation system plays a vital role in the state's economic growth and quality of life.

In this report, TRIP looks at the top transportation numbers in West Virginia as the state addresses modernizing and maintaining its system of roads, highways, bridges and transit.

In December 2015 the president signed into law a long-term federal surface transportation program that includes modest funding increases and allows state and local governments to plan and finance projects with greater certainty through 2020. The [Fixing America's Surface Transportation Act \(FAST Act\)](#) provides approximately \$305 billion for surface transportation with highway and transit funding slated to increase by approximately 15 and 18 percent, respectively, over the five-year duration of the program. 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.

COST TO WEST VIRGINIA MOTORISTS OF DEFICIENT ROADS

An inadequate transportation system costs West Virginia motorists a total of \$1.4 billion every year in the form of additional vehicle operating costs (VOC), congestion-related delays and traffic crashes.

- Driving on rough roads costs West Virginia motorists a total of \$758 million annually in extra vehicle operating costs. Costs include accelerated vehicle depreciation, additional repair costs, and increased fuel consumption and tire wear.
- Traffic crashes in which roadway design was likely a contributing factor costs West Virginia motorists a total of \$461 million each year in the form of lost household and workplace productivity, insurance and other financial costs.
- Traffic congestion costs West Virginia motorists a total of \$225 million each year in the form of lost time and wasted fuel.
- The chart below details the average cost per driver in the state's largest urban areas and statewide.

	VOC	Safety	Congestion	Total
Charleston	\$530	\$346	\$481	\$1,357
Huntington	\$418	\$341	\$362	\$1,121
Morgantown	\$815	\$313	\$311	\$1,439
Parkersburg	\$626	\$331	\$317	\$1,274
Wheeling	\$720	\$320	\$275	\$1,315
West Virginia	\$758 Million	\$461 Million	\$225 Million	\$1.4 Billion

POPULATION AND ECONOMIC TRENDS IN WEST VIRGINIA

The rate of population growth in West Virginia has resulted in increased demands on the state's major roads and highways, leading to increased wear and tear on the transportation system.

- West Virginia's population in 2015 was approximately 1.84 million residents.
- West Virginia had 1.2 million licensed drivers in 2015.
- In 2015, West Virginia's roads carried 19.5 billion vehicle miles of travel.
- From 2000 to 2015, West Virginia's gross domestic product, a measure of the state's economic output, increased by 16 percent, when adjusted for inflation. U.S. GDP increased 27 percent during this time.

WEST VIRGINIA ROAD CONDITIONS

A lack of adequate state and local funding has resulted in 29 percent of major roads and highways in West Virginia having pavement surfaces in poor condition, providing a rough ride and costing motorists in the form of additional vehicle operating costs.

- The pavement data in this report, which is for all arterial and collector roads and highways, is provided by the Federal Highway Administration (FHWA), based on data submitted annually by the West Virginia Department of Transportation (WVDOT) on the condition of major state and locally maintained roads and highways.
- Pavement data for Interstate highways and other principal arterials is collected for all system mileage, whereas pavement data for minor arterial and all collector roads and highways is based on sampling portions of roadways as prescribed by FHWA to insure that the data collected is adequate to provide an accurate assessment of pavement conditions on these roads and highways.
- Twenty-nine percent of West Virginia’s major locally and state-maintained roads are in poor condition, while 55 percent are in mediocre or fair condition. The remaining 17 percent are in good condition.
- The chart below details the share of major roads in poor, mediocre, fair and good condition in West Virginia’s largest urban areas:

	Poor	Mediocre	Fair	Good
Charleston	17%	43%	15%	25%
Huntington	16%	21%	20%	44%
Morgantown	47%	21%	9%	23%
Parkersburg	29%	22%	29%	20%
Wheeling	37%	25%	17%	21%

- Roads rated in mediocre to poor condition may show signs of deterioration, including rutting, cracks and potholes. In some cases, these roads can be resurfaced, but often are too deteriorated and must be reconstructed.
- Driving on rough roads costs West Virginia motorists a total of \$758 million annually -- \$647 per driver -- in extra vehicle operating costs. Costs include accelerated vehicle depreciation, additional repair costs, and increased fuel consumption and tire wear.

WEST VIRGINIA BRIDGE CONDITIONS

Approximately one in six of locally and state-maintained bridges in West Virginia show significant deterioration. This includes all bridges that are 20 feet or more in length.

- Seventeen percent of West Virginia’s bridges were structurally deficient in 2016, the 5th highest share nationally. This is up from 2015 when 15 percent of the state’s bridges were structurally deficient, the 8th highest share in the nation at that time. In 2014, 13 percent of the state’s bridges were structurally deficient, the 12th highest share at the time.
- A bridge is structurally deficient if there is significant deterioration of the bridge deck, supports or other major components. Structurally deficient bridges are often posted for lower weight or closed to traffic, restricting or redirecting large vehicles, including commercial trucks and emergency services vehicles.
- The chart below details the share of bridges in the state’s largest urban areas that are structurally deficient.

	Structurally Deficient	Bridges Str. Deficient	Total Bridges
Charleston	16%	87	552
Huntington	17%	107	619
Morgantown	14%	29	202
Parkersburg	4%	21	488
Wheeling	19%	95	512

HIGHWAY SAFETY AND FATALITY RATES IN WEST VIRGINIA

Improving safety features on West Virginia’s roads and highways would likely result in a decrease in the state’s traffic fatalities and serious crashes. It is estimated that roadway features are likely a contributing factor in approximately one-third of all fatal and serious traffic crashes.

- A total of 1,548 people were killed in West Virginia traffic crashes from 2011 to 2015, an average of 310 fatalities per year.
- West Virginia’s overall traffic fatality rate of 1.35 fatalities per 100 million vehicle miles of travel in 2015 was significantly higher than the national average of 1.13.
- The fatality rate on West Virginia’s non-interstate rural roads in 2015 was nearly three times higher than on all other roads in the state (2.24 fatalities per 100 million vehicle miles of travel vs. 0.81).
- The chart below details the average number of people killed in traffic fatalities in the state’s largest urban areas over the last three years.

	Average Fatalities
Charleston	24
Huntington	25
Morgantown	12
Parkersburg	18
Wheeling	17

- Traffic crashes in West Virginia imposed a total of \$1.4 billion in economic costs in 2014. TRIP estimates that traffic crashes in which roadway features were likely a contributing factor imposed \$461 million in economic costs in 2014.
- According to a 2015 National Highway Traffic Safety Administration (NHTSA) report, the economic costs of traffic crashes includes work and household productivity losses, property damage, medical costs, rehabilitation costs, legal and court costs, congestion costs and emergency services.
- Roadway features that impact safety include the number of lanes, lane widths, lighting, lane markings, rumble strips, shoulders, guard rails, other shielding devices, median barriers and intersection design. The cost of serious crashes includes lost productivity, lost earnings, medical costs and emergency services.
- Several factors are associated with vehicle crashes that result in fatalities, including driver behavior, vehicle characteristics and roadway features. TRIP estimates that roadway features are likely a contributing factor in approximately one-third of fatal traffic crashes.
- Where appropriate, highway improvements can reduce traffic fatalities and crashes while improving traffic flow to help relieve congestion. Such improvements include removing or shielding obstacles; adding or improving medians; improved lighting; adding rumble strips, wider lanes, wider and paved shoulders; upgrading roads from two lanes to four lanes; and better road markings and traffic signals.
- Investments in rural traffic safety have been found to result in significant reductions in serious traffic crashes. A 2012 report by the [Texas Transportation Institute](#) (TTI) found that improvements completed recently by the Texas Department of Transportation that widened lanes, improved shoulders and made other safety improvements on 1,159 miles of rural state roadways resulted in 133 fewer fatalities on these roads in the first three years after the improvements were completed (as compared to the three years prior). TTI estimates that the improvements on these roads are likely to save 880 lives over 20 years.

WEST VIRGINIA TRAFFIC CONGESTION

Increasing levels of traffic congestion cause significant delays in West Virginia, particularly in its larger urban areas, choking commuting and commerce. Traffic congestion robs commuters of time and money and imposes increased costs on businesses, shippers and manufacturers, which are often passed along to the consumer.

- Based on [Texas Transportation Institute](#) (TTI) estimates, the value of lost time and wasted fuel in West Virginia is approximately \$225 million per year.
- The chart below details the annual number of hours lost to congestion and the cost of lost time and wasted fuel as a result of congestion for the average driver in each of the state's largest urban areas.

	Hours Lost	Congestion Cost
Charleston	21	\$481
Huntington	16	\$362
Morgantown	14	\$311
Parkersburg	14	\$317
Wheeling	11	\$275

- Increasing levels of congestion add significant costs to consumers, transportation companies, manufacturers, distributors and wholesalers and can reduce the attractiveness of a location to a company when considering expansion or where to locate a new facility. Congestion costs can also increase overall operating costs for trucking and shipping companies, leading to revenue losses, lower pay for drivers and employees, and higher consumer costs.

TRANSPORTATION FUNDING IN WEST VIRGINIA

Investment in West Virginia's roads, highways and bridges is funded by local, state and federal governments. The five-year federal surface transportation 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 Act \(FAST Act\)](#), provides modest increases in federal highway and transit spending, allows states greater long-term funding certainty and streamlines the federal project approval process. But the FAST Act does not provide adequate funding to meet the nation's need for highway and transit improvements and does not include a long-term and sustainable funding source.

- The five-year, \$305 billion FAST Act will provide approximately a 15 percent boost in national highway funding and an 18 percent boost in national transit funding over the duration of the program, which expires in 2020.
- 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.
- According to the [2015 AASHTO Transportation Bottom Line Report](#), a significant boost in investment in the nation's roads, highways, bridges and public transit systems is needed to improve their condition and to meet the nation's transportation needs.
- AASHTO's report found that based on an annual one percent increase in VMT annual investment in the nation's roads, highways and bridges needs to increase 36 percent, from \$88 billion to \$120 billion, to improve conditions and meet the nation's mobility needs, based on an annual one percent rate of vehicle travel growth. Investment in the nation's public transit system needs to increase from \$17 billion to \$43 billion.
- The Bottom Line Report found that if the national rate of vehicle travel increased by 1.4 percent per year, the needed annual investment in the nation's roads, highways and bridges would need to increase by 64 percent to \$144 billion. If vehicle travel grows by 1.6 percent annually the needed annual investment in the nation's roads, highways and bridges would need to increase by 77 percent to \$156 billion.

TRANSPORTATION AND ECONOMIC GROWTH IN WEST VIRGINIA

The efficiency of West Virginia's transportation system, particularly its highways, is critical to the health of the state's economy. Businesses rely on an efficient and dependable transportation system to move products and services. A key component in business efficiency and success is the level and ease of access to customers, markets, materials and workers.

- Annually, \$119 billion in goods are shipped to and from sites in West Virginia, mostly by truck.
- Seventy-two percent of the goods shipped annually to and from sites in West Virginia are carried by trucks and another 10 percent are carried by courier services or multiple mode deliveries, which include trucking.
- Increasingly, companies are looking at the quality of a region's transportation system when deciding where to re-locate or expand. Regions with congested or poorly maintained roads may see businesses relocate to areas with a smoother, more efficient and more modern transportation system.

- Highway accessibility was ranked the number two site selection factor behind only the availability of skilled labor in a 2015 survey of corporate executives by [Area Development Magazine](#).
- The [Federal Highway Administration](#) estimates that each dollar spent on road, highway and bridge improvements results in an average benefit of \$5.20 in the form of reduced vehicle maintenance costs, reduced delays, reduced fuel consumption, improved safety, reduced road and bridge maintenance costs and reduced emissions as a result of improved traffic flow.

Sources of information for this report include the Federal Highway Administration (FHWA), the American Association of State Highway and Transportation Officials (AASHTO), the Bureau of Transportation Statistics (BTS), the U.S. Census Bureau, the Texas Transportation Institute (TTI) and the National Highway Traffic Safety Administration (NHTSA).

Introduction

West Virginia's roads, highways and bridges form vital transportation links for the state's residents, visitors and businesses, providing daily access to homes, jobs, shopping, natural resources and recreation. Modernizing West Virginia's transportation system is critical to quality of life and economic competitiveness in the Mountain State.

Supporting quality of life and a robust economy in West Virginia requires that the state provide a safe, efficient and well-maintained transportation system. Inadequate transportation investment, which will result in deteriorated transportation facilities and diminished access, will negatively affect economic competitiveness and quality of life in West Virginia.

To accommodate population and economic growth, maintain its level of economic competitiveness and achieve further economic growth, West Virginia will need to maintain and modernize its roads, highways and bridges by improving the physical condition of its transportation network and enhancing the system's ability to provide efficient, reliable and safe mobility for residents, visitors and businesses. Making needed improvements to West Virginia's roads, highways, bridges and transit systems could also provide a significant boost to the state's economy by creating jobs in the short term and stimulating long-term economic growth as a result of enhanced mobility and access.

This report examines the condition, use and safety of West Virginia's roads, highways and bridges, funding needs, and the future mobility needs of the state. Sources of information for this report include the Federal Highway Administration (FHWA), the American Association of State Highway and Transportation Officials (AASHTO), the Bureau of Transportation Statistics (BTS), the U.S. Census Bureau, the Texas Transportation Institute (TTI), and the National Highway Traffic Safety Administration (NHTSA).

Population, Travel and Economic Trends in West Virginia

West Virginia motorists and businesses require a high level of personal and commercial mobility. To foster quality of life and spur continued economic growth in West Virginia, it will be critical that the state provide a safe and modern transportation system that can accommodate future growth in population, tourism, business, recreation and vehicle travel.

West Virginia's population in 2015 was approximately 1.8 million residents.¹ West Virginia had approximately 1.2 million licensed drivers in 2015.² West Virginia's roads carried a total of 19.5 billion vehicle miles of travel in 2015.³

From 2000 to 2015 West Virginia's gross domestic product (GDP), a measure of the state's economic output, increased by 16 percent, when adjusted for inflation.⁴ U.S. GDP increased 27 percent during this time.⁵

Condition of West Virginia's Roads

The life cycle of West Virginia's roads is greatly affected by the state and local governments' ability to perform timely maintenance and upgrades to ensure that road and highway surfaces last as long as possible.

The pavement data in this report, which is for all arterial and collector roads and highways, is provided by the Federal Highway Administration (FHWA), based on data submitted annually by the West Virginia Department of Transportation (WVDOT) on the condition of major state and locally maintained roads and highways. Pavement data for Interstate highways

and other principal arterials is collected for all system mileage, whereas pavement data for minor arterial and all collector roads and highways is based on sampling portions of roadways as prescribed by FHWA to insure that the data collected is adequate to provide an accurate assessment of pavement conditions on these roads and highways.

Twenty-nine percent of West Virginia’s major urban locally and state-maintained roads are in in poor condition, while 55 percent are in mediocre or fair condition.⁶ The remaining 17 percent are in good condition.⁷

The chart below details the share of major roads in each of the state’s largest urban areas that are in poor, mediocre, fair or good condition.

Chart 1. Pavement conditions in West Virginia’s largest urban areas.

	Poor	Mediocre	Fair	Good
Charleston	17%	43%	15%	25%
Huntington	16%	21%	20%	44%
Morgantown	47%	21%	9%	23%
Parkersburg	29%	22%	29%	20%
Wheeling	37%	25%	17%	21%

Source: TRIP analysis of Federal Highway Administration data.

Pavement failure 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.⁸ As roads and highways continue to age, they will reach a point of deterioration where routine paving and maintenance will not be adequate to keep pavement surfaces in good condition and costly reconstruction of the roadway and its underlying surfaces will become necessary.

The Costs to Motorists of Roads in Inadequate Condition

TRIP has calculated the additional cost to motorists of driving on roads in poor, mediocre or fair condition. When roads are in poor, mediocre or fair condition – which may include potholes, rutting or rough surfaces – the cost to operate and maintain a vehicle increases. These additional vehicle operating costs (VOC) include accelerated vehicle depreciation, additional - vehicle repair costs, increased fuel consumption and increased tire wear. TRIP estimates that additional VOC borne by West Virginia motorists as a result of deteriorated road conditions is \$758 million annually, or \$647 per driver.⁹ The chart below details the amount lost annually by drivers in the state’s largest urban areas as well as statewide as a result of driving on deteriorated roads.

Chart 2. Average VOC per driver in West Virginia’s largest urban areas and statewide.

	VOC
Charleston	\$530
Huntington	\$418
Morgantown	\$815
Parkersburg	\$626
Wheeling	\$720
West Virginia	\$758 Million

Source: TRIP analysis.

Additional vehicle operating costs have been calculated in the Highway Development and Management Model (HDM), which is recognized by the U.S. Department of Transportation and more than 100 other countries as the definitive analysis of the impact of road conditions on vehicle operating costs. The HDM report is based on numerous studies that have measured the impact of various factors, including road conditions, on vehicle operating costs.¹⁰

The HDM study found that road deterioration increases ownership, repair, fuel and tire costs. The report found that deteriorated roads accelerate the pace of depreciation of vehicles and the need for repairs because the stress on the vehicle increases in proportion to the level of roughness of the pavement surface. Similarly, tire wear and fuel consumption increase as roads deteriorate since there is less efficient transfer of power to the drive train and additional friction between the road and the tires.

TRIP's additional VOC estimate is based on taking the average number of miles driven annually by a motorist, calculating current VOC based on AAA's 2015 VOC and then using the HDM model to estimate the additional VOC paid by drivers as a result of substandard roads.¹¹ Additional research on the impact of road conditions on fuel consumption by the Texas Transportation Institute (TTI) is also factored in to TRIP's vehicle operating cost methodology.

Bridge Conditions in West Virginia

West Virginia's bridges form key links in the state's highway system, providing communities and individuals access to employment, schools, shopping and medical facilities, and facilitating commerce and access for emergency vehicles.

Seventeen percent of West Virginia's locally and state maintained bridges are rated as structurally deficient, the fifth highest share nationally.¹² This is up from 2015 when 15 percent of the state's bridges were structurally deficient, the eighth highest share in the nation at that time.¹³ In 2014, 13 percent of the state's bridges were structurally deficient, the twelfth highest share at the time.¹⁴

A bridge is structurally deficient if there is significant deterioration of the bridge deck, supports or other major components. Bridges that are structurally deficient may be posted for

lower weight limits or closed if their condition warrants such action. Deteriorated bridges can have a significant impact on daily life. Restrictions on vehicle weight may cause many vehicles – especially emergency vehicles, commercial trucks, school buses and farm equipment – to use alternate routes to avoid posted bridges. Redirected trips also lengthen travel time, waste fuel and reduce the efficiency of the local economy.

The chart below details the total number of bridges and the share of structurally deficient bridges in West Virginia’s largest urban areas.

Chart 3. Bridge conditions in West Virginia’s largest urban areas.

	Structurally Deficient	Bridges Str. Deficient	Total Bridges
Charleston	16%	87	552
Huntington	17%	107	619
Morgantown	14%	29	202
Parkersburg	4%	21	488
Wheeling	19%	95	512

Source. TRIP analysis of National Bridge Inventory data.

The service life of bridges can be extended by performing routine maintenance such as resurfacing decks, painting surfaces, insuring that a facility has good drainage and replacing deteriorating components. But, most bridges will eventually require more costly reconstruction or major rehabilitation to remain operable.

Traffic Safety in West Virginia

A total of 1,548 people were killed in West Virginia traffic crashes from 2011 to 2015, an average of 310 fatalities per year.¹⁵

Chart 4. Traffic Fatalities in West Virginia from 2011 – 2015.

<i>Year</i>	<i>Fatalities</i>
2011	337
2012	339
2013	332
2014	272
2015	268
Total	1,548

Source: National Highway Traffic Safety Administration.

Three major factors are associated with fatal vehicle crashes: driver behavior, vehicle characteristics and roadway features. It is estimated that roadway features are likely a contributing factor in approximately one-third of fatal traffic crashes. Roadway features that impact safety include the number of lanes, lane widths, lighting, lane markings, rumble strips, shoulders, guard rails, other shielding devices, median barriers and intersection design.

West Virginia’s overall traffic fatality rate of 1.35 fatalities per 100 million vehicle miles of travel in 2015 is significantly higher than the national average of 1.13.¹⁶ The traffic fatality rate on the state’s rural roads is disproportionately high. The fatality rate on West Virginia’s non-interstate rural roads is nearly three times higher than on all other roads in the state (2.24 fatalities per 100 million vehicle miles of travel vs. 0.81).¹⁷

The chart below details the average number of people killed in traffic fatalities in the last three years in West Virginia’s largest urban areas.

Chart 5. Average traffic fatalities in last three years in West Virginia’s largest urban areas.

	Average Fatalities
Charleston	24
Huntington	25
Morgantown	12
Parkersburg	18
Wheeling	17

Source: TRIP analysis of National Highway Traffic Safety Administration data.

Traffic crashes in West Virginia imposed a total of \$1.4 billion in economic costs in 2014.¹⁸ TRIP estimates that traffic crashes in which roadway features were likely a contributing factor imposed \$461 million in economic costs in 2014.¹⁹

According to a 2015 National Highway Traffic Safety Administration (NHTSA) report, the economic costs of traffic crashes includes work and household productivity losses, property damage, medical costs, rehabilitation costs, legal and court costs, congestion costs and emergency services.²⁰

Improving safety on West Virginia's roadways can be achieved through further improvements in vehicle safety; improvements in driver, pedestrian, and bicyclist behavior; and, a variety of improvements in roadway safety features.

The severity of serious traffic crashes could be reduced through roadway improvements, where appropriate, such as adding turn lanes, removing or shielding obstacles, adding or improving medians, widening lanes, widening and paving shoulders, improving intersection layout, and providing better road markings and upgrading or installing traffic signals. Roads with poor geometry, with insufficient clear distances, without turn lanes, having inadequate shoulders for the posted speed limits, or poorly laid out intersections or interchanges, pose greater risks to motorists, pedestrians and bicyclists.

Investments in rural traffic safety have been found to result in significant reductions in serious traffic crashes. A [2012 report by TTI](#) found that improvements completed recently by TxDOT that widened lanes, improved shoulders and made other safety improvements on 1,159 miles of rural state roadways resulted in 133 fewer fatalities on these roads in the first three years after the improvements were completed (as compared to the three years prior).²¹ TTI estimates that the improvements on these roads are likely to save 880 lives over 20 years.²²

Traffic Congestion in West Virginia

Increasing levels of traffic congestion cause significant delays in West Virginia, particularly in its larger urban areas, choking commuting and commerce. Traffic congestion robs commuters of time and money and imposes increased costs on businesses, shippers and manufacturers, which are often passed along to the consumer.

Based on TTI methodology, TRIP estimates the value of lost time and wasted fuel in West Virginia is approximately \$225 million per year. The chart below details the numbers of hours lost and cost off lost time and fuel for the average driver in the state's largest urban areas as a result of congestion.

Chart 6. Congestion cost and hours lost for drivers in West Virginia's largest urban areas.

	Hours Lost	Congestion Cost
Charleston	21	\$481
Huntington	16	\$362
Morgantown	14	\$311
Parkersburg	14	\$317
Wheeling	11	\$275

Source: Texas Transportation Institute Urban Mobility Report.

Increasing levels of congestion add significant costs to consumers, transportation companies, manufacturers, distributors and wholesalers. Increased levels of congestion can reduce the attractiveness of a location to a company when considering expansion or where to locate a new facility. Congestion costs can also increase overall operating costs for trucking and shipping companies, leading to revenue losses, lower pay for employees, and higher consumer costs.

Transportation Funding

Investment in West Virginia's roads, highways and bridges is funded by local, state and federal governments. A lack of sufficient funding at all levels will make it difficult to adequately maintain and improve the state's existing transportation system.

The federal government is a critical source of funding for West Virginia's roads, highways, bridges and transit systems and provides a significant return in road and bridge funding based on the revenue generated in the state by the federal motor fuel tax.

Most federal funds for highway and transit improvements in West Virginia are provided by federal highway user fees, largely an 18.4 cents-per-gallon tax on gasoline and a 24.4 cents-per-gallon tax on diesel fuel. Since 2008 revenue into the federal Highway Trust Fund has been inadequate to support legislatively set funding levels so Congress has transferred approximately \$53 billion in general funds and an additional \$2 billion from a related trust fund into the federal Highway Trust Fund.²³

Signed into law in December 2015, the [Fixing America's Surface Transportation Act \(FAST Act\)](#), provides modest increases in federal highway and transit spending. The five-year bill also provides states with greater funding certainty and streamlines the federal project approval process. But, the FAST Act does not provide adequate funding to meet the nation's need for highway and transit improvements and does not include a long-term and sustainable funding source.

The five-year, \$305 billion FAST Act will provide approximately a 15 percent boost in highway funding and an 18 percent boost in transit funding over the duration of the program, which expires in 2020.²⁴ 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.

According to the [2015 AASHTO Transportation Bottom Line Report](#), a significant boost in investment in the nation's roads, highways, bridges and public transit systems is needed to improve their condition and to meet the nation's transportation needs. The AASHTO report found that based on an annual 1 percent increase in VMT that annual investment in the nation's roads, highways and bridges needs to increase by 36 percent, from \$88 billion to \$120 billion to improve conditions and meet the nation's mobility needs.²⁵ Investment in the nation's public transit system needs to increase from \$17 billion to \$43 billion.²⁶

The [2015 AASHTO Transportation Bottom Line Report](#) found that if the rate of vehicle travel increased by 1.4 percent per year, the needed annual investment in the nation's roads, highways and bridges would need to increase by 64 percent, to \$144 billion. If vehicle travel grows by 1.6 percent annually the needed annual investment in the nation's roads, highways and bridges would need to increase by 77 percent, to \$156 billion.²⁷

Importance of Transportation to Economic Growth

Today's culture of business demands that an area have well-maintained and efficient roads, highways and bridges if it is to remain economically competitive. Global communications and the impact of free trade in North America and elsewhere have resulted in a significant increase in freight movement, making the quality of a region's transportation system a key component in a business's ability to compete locally, nationally and internationally.

Businesses have responded to improved communications and the need 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 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.

Highways are vitally important to continued economic development in West Virginia, particularly to the state's manufacturing, biotechnology, agriculture and tourism industries. As the economy expands, creating more jobs and increasing consumer confidence, the demand for consumer and business products grows. In turn, manufacturers ship greater quantities of goods to market to meet this demand, a process that adds to truck traffic on the state's highways and major arterial roads.

Every year, \$119 billion in goods are shipped to and from sites in West Virginia, mostly by trucks.²⁸ Seventy-two percent of the goods shipped annually to and from sites in West Virginia are carried by trucks and another 10 percent are carried by courier services or multiple-mode deliveries, which include trucking.²⁹

The cost of road and bridge improvements are more than offset by the reduction of user costs associated with driving on rough roads, the improvement in business productivity, the reduction in delays and the improvement in traffic safety. The [Federal Highway Administration estimates](#) that each dollar spent on road, highway and bridge improvements results in an average benefit of \$5.20 in the form of reduced vehicle maintenance costs, reduced delays, reduced fuel consumption, improved safety, reduced road and bridge maintenance costs and reduced emissions as a result of improved traffic flow.³⁰

Local, regional and state economic performance is improved when a region's surface transportation system is expanded or repaired. This improvement comes as a result of the initial job creation and increased employment created over the long-term because of improved access, reduced transport costs and improved safety.

Increasingly, companies are looking at the quality of a region's transportation system when deciding where to re-locate or expand. Regions with congested or poorly maintained roads may see businesses relocate to areas with a smoother, more efficient and more modern transportation system. In fact, highway accessibility was ranked the number two site selection factor behind only the availability of skilled labor in a 2015 survey of corporate executives by [Area Development Magazine](#).³¹

Conclusion

As West Virginia works to build and enhance a thriving, growing and dynamic state, it will be critical that it is able to address the state's most significant transportation issues by providing a 21st century network of roads, highways, bridges and transit that can accommodate the mobility demands of a modern society.

West Virginia will need to modernize its surface transportation system by improving the physical condition of its transportation network and enhancing the system's ability to provide efficient, safe and reliable mobility for residents, visitors and businesses. Making needed improvements to the state's roads, highways, bridges and transit systems could provide a significant boost to the economy by creating jobs in the short term and stimulating long-term economic growth as a result of enhanced mobility and access.

While the modest funding increase provided by the FAST Act will be helpful, numerous projects to improve the condition and expand the capacity of West Virginia's roads, highways, bridges and transit systems will not be able to proceed without a substantial boost in state or local transportation funding. If West Virginia is unable to complete needed transportation projects it will hamper the state's ability to improve the condition and efficiency of its transportation system or enhance economic development opportunities and quality of life.

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Endnotes

¹ U.S. Census Bureau (2016).

² Highway Statistics (2015). Federal Highway Administration. DL-1C

³ TRIP analysis of Federal Highway Administration Traffic Volume Trends report.
https://www.fhwa.dot.gov/policyinformation/travel_monitoring/tvt.cfm

⁴ TRIP analysis of Bureau of Economic Analysis data.

⁵ Ibid.

⁶ Federal Highway Administration. Highway Statistics 2015.

⁷ Ibid.

⁸ Selecting a Preventative Maintenance Treatment for Flexible Pavements. R. Hicks, J. Moulthrop. Transportation Research Board. 1999. Figure 1.

⁹ TRIP calculation.

¹⁰ Highway Development and Management: Volume Seven. Modeling Road User and Environmental Effects in HDM-4. Bennett, C. and Greenwood, I. 2000.

¹¹ Your Driving Costs. American Automobile Association. 2015.

¹² Federal Highway Administration National Bridge Inventory, 2017.

¹³ Federal Highway Administration National Bridge Inventory, 2016.

¹⁴ Federal Highway Administration National Bridge Inventory, 2015.

¹⁵ Federal Highway Administration National Highway Traffic Safety Administration, 2011-2015.

¹⁶ TRIP analysis of National Highway Traffic Safety Administration and Federal Highway Administration data (2016).

¹⁷ Ibid.

¹⁸ TRIP estimate based on NHTSA report “The Economic and Societal Impact Of Motor Vehicle Crashes, 2010 (Revised), 2015. P. 146.

¹⁹ Ibid.

²⁰ The Economic and Societal Impact Of Motor Vehicle Crashes, 2010 (Revised) (2015). National Highway Traffic Safety Administration. P. 1. <https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/812013>

²¹ Adding Highway Shoulders, Width, Reduce Crash Numbers and Save Lives (August 9, 2012). Texas Transportation Institute.

²² Ibid.

²³ “Surface Transportation Reauthorization and the Solvency of the Highway Trust Fund,” presentation by Jim Tymon, American Association of State Highway and Transportation Officials (2014).

²⁴ 2015 “Fixing America’s Surface Transportation Act.” (2015) American Road and Transportation Builders Association. <http://www.artba.org/newsline/wp-content/uploads/2015/12/ANALYSIS-FINAL.pdf>

²⁵ 2015 AASHTO Bottom Line Report (2014) AASHTO. P. 2.

²⁶ Ibid.

²⁷ Ibid.

²⁸ TRIP analysis of Bureau of Transportation Statistics, U.S. Department of Transportation. 2012 Commodity Flow Survey, State Summaries.

²⁹ Ibid.

³⁰ FHWA estimate based on its analysis of 2006 data. For more information on FHWA’s cost-benefit analysis of highway investment, see the 2008 Status of the Nation’s Highways, Bridges, and Transit: Conditions and Performance.

³¹ Area Development Magazine (2016). 30th Annual Survey of Corporate Executives: Availability of Skilled Labor New Top Priority. <http://www.areadevelopment.com/Corporate-Consultants-Survey-Results/Q1-2016/corporate-executive-site-selection-facility-plans-441729.shtml>