

# ***SOUTH CAROLINA TRANSPORTATION BY THE NUMBERS:***

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

**March 2017**



*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 South Carolina

<b>\$5.4 billion</b>	Driving on deficient roads costs South Carolina motorists a total of \$5.4 billion annually in the form of additional vehicle operating costs (VOC), congestion-related delays and crashes.
<b>Charleston - \$1,850 Columbia - \$1,716 Florence - \$1,283 GSA Metro - \$1,379 Myrtle Beach - \$1,789</b>	TRIP has calculated the cost to the average motorist in the state's largest urban areas in the form of additional VOC, congestion-related delays and traffic crashes. Drivers in the state's largest urban areas incur annual costs as a result of driving on deficient roads as follows: Charleston - \$1,850; Columbia - \$1,716; Florence - \$1,283; Greenville-Spartanburg-Anderson (GSA) Metro Area - \$1,379 Myrtle Beach - \$1,789.
<b>4,406 881</b>	A total of 4,406 people were killed in South Carolina traffic crashes from 2012 to 2016, an average of 881 fatalities annually.
<b>19%  10%</b>	Vehicle miles traveled (VMT) in South Carolina increased by 19 percent from 2000 to 2016 –from 45.5 billion VMT in 2000 to 54 billion VMT in 2016. In the last three years (2013 to 2016), VMT in South Carolina increased 10 percent.
<b>1.89 1<sup>st</sup> 4X</b>	The fatality rate on South Carolina's roads is the highest in the nation at 1.89 fatalities per 100 million vehicle miles of travel. South Carolina's rural roads are particularly deadly, with a fatality rate that is nearly four times higher than on all other roads in the state (3.82 fatalities per 100 million VMT vs. 1.03).
<b>2/3 54%</b>	Approximately two-thirds of South Carolina's major urban roads are in poor or mediocre condition. Twenty-nine percent are in poor condition and 35 percent are in mediocre condition. The South Carolina Department of Transportation (SCDOT) reports that the pavements on 54 percent of state-maintained roads and highways are in need of reconstruction.
<b>46%</b>	SCDOT currently spends \$415 million annually on road and highway pavement repairs and reconstruction. This represents less than half (46 percent) of the \$900 million needed annually to significantly improve the state's major roads and highways.
<b>10%</b>	Ten percent of South Carolina's bridges are structurally deficient, meaning they have significant deterioration to the major components of the bridge.
<b>Charleston – 41 hours Columbia – 38 hours Florence – 11 hours GSA Metro – 20 hours Myrtle Beach – 30 hours</b>	Mounting congestion robs drivers of time and fuel. Annual time wasted in congestion for drivers in the state's largest urban areas is: Charleston – 41 hours; Columbia – 38 hours; Florence – 11 hours; GSA Metro Area – 20 hours; Myrtle Beach – 30 hours.
<b>\$1.00 = \$5.20</b>	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 and reduced emissions.

## **Executive Summary**

The rate of economic growth in South Carolina, which is greatly impacted by the reliability and condition of the state's transportation system, has a significant impact on quality of life in the Palmetto 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 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 manufacturing, corporate and financial services, agriculture, and tourism, the quality of South Carolina'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 South Carolina as the state addresses modernizing and maintaining its system of roads, highways, bridges and transit.

### **COST TO SOUTH CAROLINA MOTORISTS OF DEFICIENT ROADS** **An inadequate transportation system costs South Carolina motorists a total of \$5.4 billion every year in the form of additional vehicle operating costs (VOC), congestion-related delays and traffic crashes.**

- Driving on rough roads costs South Carolina motorists a total of \$1.8 billion 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 South Carolina motorists a total of \$1.8 billion each year in the form of lost household and workplace productivity, insurance and other financial costs.
- Traffic congestion costs South Carolina motorists a total of \$1.8 billion 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.

<b>Location</b>	<b>VOC</b>	<b>Safety</b>	<b>Congestion</b>	<b>TOTAL</b>
Charleston	\$452	\$351	\$1,047	\$1,850
Columbia	\$449	\$316	\$951	\$1,716
Florence	\$472	\$539	\$272	\$1,283
GSA Metro	\$492	\$378	\$509	\$1,379
Myrtle Beach	\$527	\$508	\$754	\$1,789
<b>South Carolina</b>	<b>\$1.8 Billion</b>	<b>\$1.8 Billion</b>	<b>\$1.8 Billion</b>	<b>\$5.4 Billion</b>

## **POPULATION, TRAVEL AND ECONOMIC TRENDS IN SOUTH CAROLINA**

**The rate of population and economic growth in South Carolina has resulted in increased demands on the state’s major roads and highways, leading to increased wear and tear on the transportation system.**

- South Carolina’s population reached approximately 5 million residents in 2016, a 24 increase since 2000 and the tenth largest increase in the nation during that time. South Carolina had approximately 3.7 million licensed drivers in 2015.
- Vehicle miles traveled (VMT) in South Carolina increased by 19 percent from 2000 to 2016 –from 45.5 billion VMT in 2000 to 54 billion VMT in 2016.
- Vehicle travel in South Carolina has increased 10 percent just in the last three years (2013-2016), the ninth largest increase during that time.
- From 2000 to 2015, South Carolina’s gross domestic product, a measure of the state’s economic output, increased by 21 percent, when adjusted for inflation. U.S. GDP increased 27 percent during this time.
- By 2030, vehicle travel in South Carolina is projected to increase by another 20 percent.

## **SOUTH CAROLINA ROAD CONDITIONS**

**A lack of adequate state and local funding has resulted in two-thirds of major urban roads and highways in South Carolina having pavement surfaces in poor or mediocre condition, providing a rough ride and costing motorists in the form of additional vehicle operating costs. SCDOT estimates that it has less than half of the funding needed to improve the state’s major roads and highways.**

- 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 South Carolina Department of Transportation (SCDOT) 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 ensure that the data collected is adequate to provide an accurate assessment of pavement conditions on these roads and highways.
- Twenty-nine percent of South Carolina’s major locally and state-maintained urban roads and highways have pavements in poor condition, while 35 percent are rated in mediocre condition. Nineteen percent of major urban roads are in fair condition and the remaining 17 percent are rated in good condition.
- Overall, 16 percent of South Carolina’s major locally and state-maintained roads and highways have pavements in poor condition, while 29 percent are in mediocre condition. Twenty-four percent of the state’s major roads are rated in fair condition and the remaining 32 percent are rated in good condition.
- SCDOT reports that the pavements on 54 percent of state-maintained roads and highways are in need of reconstruction.
- Currently SCDOT spends \$415 million annually on road and highway pavement repairs and reconstruction, less than half (46 percent) of the \$900 million that is needed annually to significantly improve the condition of the state’s major roads and highways.
- The chart below details the share of pavement in poor, mediocre, fair and good condition in the state’s largest urban areas.

<b>Location</b>	<b>Poor</b>	<b>Mediocre</b>	<b>Fair</b>	<b>Good</b>
Charleston	17%	26%	33%	25%
Columbia	13%	40%	27%	20%
Florence	15%	38%	27%	21%
GSA Metro	17%	40%	21%	22%
Myrtle Beach	23%	37%	6%	34%

- 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 South Carolina motorists a total of \$1.8 billion annually in extra vehicle operating costs. Costs include accelerated vehicle depreciation, additional repair costs, and increased fuel consumption and tire wear.

## **SOUTH CAROLINA BRIDGE CONDITIONS**

**Ten percent of locally and state-maintained bridges in South Carolina show significant deterioration. This includes all bridges that are 20 feet or more in length.**

- Ten percent of South Carolina’s bridges are structurally deficient. 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 structurally deficient bridges in Charleston, Columbia, Florence, the GSA Metro Area and Myrtle Beach.

<b>Location</b>	<b>Bridges</b>	<b>Deficient</b>	<b>Deficient</b>
Charleston	492	33	7%
Columbia	584	78	13%
Florence	275	3	1%
GSA Metro	1,699	144	8%
Myrtle Beach	448	23	5%

## **HIGHWAY SAFETY AND FATALITY RATES IN SOUTH CAROLINA**

**The fatality rate on South Carolina’s roads is the highest in the nation. Improving safety features on South Carolina’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.**

- South Carolina’s overall traffic fatality rate of 1.89 fatalities per 100 million vehicle miles of travel in 2015 is significantly higher than the national average of 1.13 and the highest fatality rate in the nation.
- A total of 4,406 people were killed in South Carolina traffic crashes from 2012 to 2016, an average of 881 fatalities per year.
- The fatality rate on South Carolina’s non-interstate rural roads in 2015 was nearly four times greater than on all other roads in the state (3.82 fatalities per 100 million vehicle miles of travel vs. 1.03).
- The chart below details the average number of people killed in traffic crashes from 2013 to 2015 in the state’s largest urban areas, as well as the cost per motorist of traffic crashes.

<b>Location</b>	<b>Average Fatalities</b>	<b>Cost Per Driver</b>
Charleston	86	\$351
Columbia	90	\$316
Florence	31	\$539
GSA Metro	154	\$378
Myrtle Beach	65	\$508

- Traffic crashes in South Carolina imposed a total of \$5.3 billion in economic costs in 2015. TRIP estimates that traffic crashes in which roadway features were likely a contributing factor imposed \$1.8 billion in economic costs in 2015.
- 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.

## **SOUTH CAROLINA TRAFFIC CONGESTION**

**Increasing levels of traffic congestion cause significant delays in South Carolina, 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 South Carolina is approximately \$1.8 billion per year.
- The chart below details the number of hours lost to congestion by the average driver in the state's largest urban areas, as well as the annual cost of traffic congestion per driver in the form of lost time and wasted fuel.

<b>Location</b>	<b>Hours Lost</b>	<b>Congestion Cost</b>
Charleston	41	\$1,047
Columbia	38	\$951
Florence	11	\$272
GSA Metro	20	\$509
Myrtle Beach	30	\$754

- 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 SOUTH CAROLINA**

**Investment in South Carolina'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 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 a boost of approximately 15 percent in national highway funding and 18 percent 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,. Investment in the nation's public transit system needs to increase from \$17 billion to \$43 billion.

## **TRANSPORTATION AND ECONOMIC GROWTH IN SOUTH CAROLINA**

**The efficiency of South Carolina'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, \$333 billion in goods are shipped to and from sites in South Carolina, mostly by truck.
- Seventy-six percent of the goods shipped annually to and from sites in South Carolina are carried by trucks and another 14 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 South Carolina Department of Transportation (SCDOT), the Texas Transportation Institute (TTI) and the National Highway Traffic Safety Administration (NHTSA).*

## **Introduction**

South Carolina'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 South Carolina's transportation system is critical to quality of life and economic competitiveness in the Palmetto State.

Supporting quality of life and a robust economy in South Carolina 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 South Carolina.

To accommodate population and economic growth, maintain its level of economic competitiveness and achieve further economic growth, South Carolina 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 South Carolina'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 South Carolina'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 South Carolina Department of Transportation

(SCDOT), the Texas Transportation Institute (TTI), and the National Highway Traffic Safety Administration (NHTSA).

## **Population, Travel and Economic Trends in South Carolina**

South Carolina motorists and businesses require a high level of personal and commercial mobility. To foster quality of life and spur continued economic growth in South Carolina, 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.

South Carolina's population grew to approximately 5 million residents in 2016, a 24 percent increase since 2000 and the tenth highest rate of growth in the nation during that time.<sup>1</sup> South Carolina had approximately 3.7 million licensed drivers in 2015.<sup>2</sup> From 2000 to 2015, South Carolina's gross domestic product (GDP), a measure of the state's economic output, increased by 21 percent, when adjusted for inflation.<sup>3</sup> U.S. GDP increased 27 percent during this period.<sup>4</sup>

From 2000 to 2016, annual VMT in South Carolina increased by 19 percent, from 45.5 billion miles traveled annually to 54 billion miles traveled annually.<sup>5</sup> Vehicle travel in South Carolina has increased ten percent just in the last three years (2013-2016), the ninth largest increase during that time.<sup>6</sup>

Based on population and other lifestyle trends, TRIP estimates that travel on South Carolina's roads and highways will increase by another 20 percent by 2030.<sup>7</sup>

## **Condition of South Carolina's Roads**

The life cycle of South Carolina'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 South Carolina Department of Transportation (SCDOT) 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 ensure that the data collected is adequate to provide an accurate assessment of pavement conditions on these roads and highways.

Statewide, 16 percent of South Carolina's major locally and state-maintained roads are in poor condition, while 29 percent are in mediocre condition. Twenty-four percent are in fair condition and the remaining 32 percent are in good condition.<sup>8</sup>

Nearly two-thirds of South Carolina's major urban roads are in poor or mediocre condition. Twenty-nine percent of South Carolina's major locally and state-maintained urban roads and highways have pavements rated in poor condition, while 35 percent are in mediocre condition.<sup>9</sup> Nineteen percent of South Carolina's major urban roads are rated in fair condition and the remaining 17 percent are rated in good condition.<sup>10</sup>

The chart below details pavement conditions on major urban roads in the state's largest urban areas.<sup>11</sup>

**Chart 1. Pavement conditions on major roads in the state's largest urban areas.**

<b>Location</b>	<b>Poor</b>	<b>Mediocre</b>	<b>Fair</b>	<b>Good</b>
Charleston	17%	26%	33%	25%
Columbia	13%	40%	27%	20%
Florence	15%	38%	27%	21%
GSA Metro	17%	40%	21%	22%
Myrtle Beach	23%	37%	6%	34%

**Source: TRIP analysis of Federal Highway Administration data.**

The South Carolina Department of Transportation (SCDOT) reports that the pavements on 54 percent of state-maintained roads and highways are in need of reconstruction.<sup>12</sup> Currently SCDOT spends \$415 million annually on road and highway pavement repairs and reconstruction, less than half (46 percent) of the \$900 million that is needed annually to significantly improve the condition of the state's major roads and highways.<sup>13</sup>

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.<sup>14</sup> 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 South Carolina motorists as a result of deteriorated road conditions is \$1.8 billion annually, or \$502 per driver.<sup>15</sup> The chart below details additional VOC per motorist in the state’s largest urban areas.

**Chart 2. Vehicle operating costs per motorist as a result of driving on deteriorated roads.**

<b>Location</b>	<b>VOC</b>
Charleston	\$452
Columbia	\$449
Florence	\$472
GSA Metro	\$492
Myrtle Beach	\$527
<b>South Carolina</b>	<b>\$1.8 Billion</b>

**Source: TRIP estimates.**

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.<sup>16</sup>

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 2016 VOC and then using the HDM model to estimate the additional VOC paid by drivers as a result of substandard roads.<sup>17</sup> 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 South Carolina**

South Carolina'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.

Ten percent of South Carolina's locally and state maintained bridges are rated as structurally deficient.<sup>18</sup> 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 share of bridges in the state’s largest urban areas that are structurally deficient.

**Chart 3. Share of structurally deficient bridges in South Carolina’s largest urban areas.**

<b>Location</b>	<b>Bridges</b>	<b>Deficient</b>	<b>Deficient</b>
Charleston	492	33	7%
Columbia	584	78	13%
Florence	275	3	1%
GSA Metro	1,699	144	8%
Myrtle Beach	448	23	5%

**Source: TRIP analysis of Federal Highway Administration National Bridge Inventory.**

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 South Carolina**

A total of 4,406 people were killed in South Carolina traffic crashes from 2012 to 2016, an average of 881 fatalities per year.<sup>19</sup>

**Chart 4. Traffic Fatalities in South Carolina from 2012 – 2016.**

<i>Year</i>	<i>Fatalities</i>
2012	863
2013	767
2014	824
2015	977
2016	975
<b>Total</b>	<b>4,406</b>

**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.

South Carolina’s overall traffic fatality rate of 1.89 fatalities per 100 million vehicle miles of travel in 2015 is significantly higher than the national average of 1.13 and the highest in the nation.<sup>20</sup> The traffic fatality rate on the state’s rural roads is disproportionately high. The fatality rate on South Carolina’s non-interstate rural roads is nearly four times higher than on all other roads in the state (3.82 fatalities per 100 million vehicle miles of travel vs. 1.03).<sup>21</sup>

The chart below details the number of people killed in traffic crashes in the state’s largest urban areas between 2013 and 2015, as well as the cost of traffic crashes per driver.

**Chart 5. Average fatalities between 2013 and 2015 and crash cost per driver.**

<b>Location</b>	<b>Average Fatalities</b>	<b>Cost Per Driver</b>
Charleston	86	\$351
Columbia	90	\$316
Florence	31	\$539
GSA Metro	154	\$378
Myrtle Beach	65	\$508

**Source: TRIP analysis.**

Traffic crashes in South Carolina imposed a total of \$5.3 billion in economic costs in 2015.<sup>22</sup> TRIP estimates that traffic crashes in which roadway features were likely a contributing factor imposed \$1.8 billion in economic costs in 2015.<sup>23</sup>

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.<sup>24</sup>

Improving safety on South Carolina'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).<sup>25</sup> TTI estimates that the improvements on these roads are likely to save 880 lives over 20 years.<sup>26</sup>

## **Traffic Congestion in South Carolina**

Increasing levels of traffic congestion cause significant delays in South Carolina, 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 South Carolina is approximately \$1.8 billion per year. The chart below details the number of hours lost annually for each driver in the state’s largest urban areas, as well as the per-driver cost of lost time and wasted fuel due to congestion.

**Chart 6. Annual hours lost to congestion and congestion costs per driver.**

<b>Location</b>	<b>Hours Lost</b>	<b>Congestion Cost</b>
Charleston	41	\$1,047
Columbia	38	\$951
Florence	11	\$272
GSA Metro	20	\$509
Myrtle Beach	30	\$754

**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 South Carolina’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 South Carolina'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 South Carolina 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.<sup>27</sup>

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 a boost of approximately 15 percent in highway funding and 18 percent in transit funding over the duration of the program, which expires in 2020.<sup>28</sup> 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 one 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.<sup>29</sup> Investment in the nation's public transit system needs to increase from \$17 billion to \$43 billion.<sup>30</sup>

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.<sup>31</sup>

## **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 South Carolina. 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, \$333 billion in goods are shipped to and from sites in South Carolina, mostly by trucks.<sup>32</sup> Seventy-six percent of the goods shipped annually to and from sites in South Carolina are carried by trucks and another 14 percent are carried by courier services or multiple-mode deliveries, which include trucking.<sup>33</sup>

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.<sup>34</sup>

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. 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](#).<sup>35</sup>

## **Conclusion**

As South Carolina 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 21<sup>st</sup> century network of roads, highways, bridges and transit that can accommodate the mobility demands of a modern society.

South Carolina 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 has been helpful, numerous projects to improve the condition and expand the capacity of South Carolina's roads, highways, bridges and transit systems will not be able to proceed without a substantial boost in state or local transportation funding. If South Carolina 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

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- <sup>2</sup> Highway Statistics (2015). Federal Highway Administration. DL-1C
- <sup>3</sup> TRIP analysis of Bureau of Economic Analysis data.
- <sup>4</sup> Ibid.
- <sup>5</sup> U.S. Department of Transportation - Federal Highway Administration: Highway Statistics 2000 and 2015.
- <sup>6</sup> Ibid.
- <sup>7</sup> TRIP calculation based on U.S. Census and Federal Highway Administration data.
- <sup>8</sup> Federal Highway Administration (2016). Pavement condition data is for 2014.
- <sup>9</sup> Ibid.
- <sup>10</sup> Ibid.
- <sup>11</sup> Ibid.
- <sup>12</sup> “The State of SCDOT”. Presentation by SCDOT Secretary Christy Hall, P.E. February 1, 2017. <http://www.scdot.org/inside/pdfs/2017StateofSCDOTcentennial.pdf>
- <sup>13</sup> Ibid.
- <sup>14</sup> Selecting a Preventative Maintenance Treatment for Flexible Pavements. R. Hicks, J. Moulthrop. Transportation Research Board. 1999. Figure 1.
- <sup>15</sup> TRIP calculation.
- <sup>16</sup> Highway Development and Management: Volume Seven. Modeling Road User and Environmental Effects in HDM-4. Bennett, C. and Greenwood, I. 2000.
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- <sup>21</sup> Ibid.
- <sup>22</sup> TRIP estimate based on NHTSA report “The Economic and Societal Impact Of Motor Vehicle Crashes, 2010 (Revised), 2015. P. 146.
- <sup>23</sup> Ibid.
- <sup>24</sup> 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>
- <sup>25</sup> Adding Highway Shoulders, Width, Reduce Crash Numbers and Save Lives (August 9, 2012). Texas Transportation Institute.
- <sup>26</sup> Ibid.
- <sup>27</sup> “Surface Transportation Reauthorization and the Solvency of the Highway Trust Fund,” presentation by Jim Tymon, American Association of State Highway and Transportation Officials (2014).
- <sup>28</sup> 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>
- <sup>29</sup> 2015 AASHTO Bottom Line Report (2014) AASHTO. P. 2.
- <sup>30</sup> Ibid.
- <sup>31</sup> Ibid.
- <sup>32</sup> TRIP analysis of Bureau of Transportation Statistics, U.S. Department of Transportation. 2012 Commodity Flow Survey, State Summaries.
- <sup>33</sup> Ibid.
- <sup>34</sup> 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.

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<sup>35</sup> 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>