Virginia Transportation By The Numbers:

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

FEBRUARY 2020

TRIP
A National Transportation Research Nonprofit

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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.

VIRGINIA KEY TRANSPORTATION FACTS

THE HIDDEN COSTS OF DEFICIENT ROADS

Driving on Virginia roads that are deteriorated, congested and that lack some desirable safety features costs Virginia drivers a total of $9.5 billion each year. TRIP has calculated the cost to the average motorist in the state's largest urban areas in the form of additional vehicle operating costs (VOC) as a result of driving on rough roads, the cost of lost time and wasted fuel due to congestion, and the financial cost of traffic crashes. The chart below details the cost of deficient roads statewide and for the average driver in the state's largest urban areas.

Location	VOC	Safety	Congestion	TOTAL
Hampton Roads	$684	$317	$758	$1,759
Northern Virginia	$485	$83	$2,015	$2,583
Richmond	$512	$349	$641	$1,502
Roanoke	$361	$457	$510	$1,328
VIRGINIA STATEWIDE	**$2.8 Billion**	**$2.1 Billion**	**$4.6 Billion**	**$9.5 Billion**

VIRGINIA ROADS PROVIDE A ROUGH RIDE

Due to inadequate state and local funding, 34 percent of major roads and highways in Virginia are in poor or mediocre condition. Driving on rough roads costs the average Virginia driver $468 annually in additional vehicle operating costs – a total of $2.8 billion statewide. The chart below details pavement conditions on major roads in the state's largest urban areas and statewide.

Location	Poor	Mediocre	Fair	Good
Hampton Roads	30%	29%	16%	24%
Northern Virginia	16%	27%	20%	36%
Richmond	17%	30%	21%	33%
Roanoke	10%	20%	23%	47%
VIRGINIA STATEWIDE	**12%**	**22%**	**24%**	**42%**

VIRGINIA BRIDGE CONDITIONS

More than 600 of Virginia's bridges (646) are rated in poor/structurally deficient condition. Bridges that are rated poor/structurally deficient have significant deterioration of the bridge deck, supports or other major components. More than eight thousand (8,499) of the state's bridges are rated in fair condition and the remaining 4,786 are in good condition. Most bridges are designed to last 50 years before major overhaul or replacement, although many newer bridges are being designed to last 75 years or longer. In Virginia, 46 percent of the state's bridges were built in 1969 or earlier. The chart below details bridge conditions statewide and in the state's largest urban areas.

	Number Poor/ Structurally Deficient	Number Fair	Number Good	Total Bridges
Hampton Roads	52	717	306	1,075
Northern Virginia	30	759	855	1,644
Richmond	59	688	324	1,071
Roanoke	22	441	255	718
VIRGINIA STATEWIDE	**646**	**8,499**	**4,786**	**13,931**

VIRGINIA ROADS ARE INCREASINGLY CONGESTED

Congested roads choke commuting and commerce and cost Virginia drivers $4.6 billion each year in the form of lost time and wasted fuel. In the most congested urban areas, drivers lose up to $2,015 and spend as many as 102 hours per year sitting in traffic as a result of congestion.

Location	Hours Lost to Congestion	Annual Cost Per Driver
Hampton Roads	46	$758
Northern Virginia	102	$2,015
Richmond	35	$641
Roanoke	25	$510

VIRGINIA TRAFFIC SAFETY AND FATALITIES

From 2014 to 2018, 3,875 people were killed in traffic crashes in Virginia. In 2018, Virginia had 0.96 traffic fatalities for every 100 million miles traveled, lower than the national average of 1.13. The fatality rate on Virginia's non-interstate rural roads in 2018 was approximately three times higher than on all other roads in the state (2.05 fatalities per 100 million vehicle miles of travel vs. 0.63).

Traffic crashes imposed a total of $6.4 billion in economic costs in Virginia in 2018 and traffic crashes in which a lack of adequate roadway safety features were likely a contributing factor imposed $2.1 billion in economic costs. The chart below details the number of people killed in traffic crashes in the state's largest urban areas between 2015 and 2018, and the cost of traffic crashes per driver.

Location	Average Fatalities	Annual Cost Per Driver
Hampton Roads	134	$317
Northern Virginia	53	$83
Richmond	96	$349
Roanoke	34	$457

TRANSPORTATION FUNDING IN VIRGINIA

Virginia's current sources of transportation revenues will not keep pace with the state's future transportation needs. This is partially a result of increasing vehicle fuel efficiency and the increasing use of electric vehicles, which have reduced the revenue generated by the state's motor fuel taxes. The average fuel efficiency of U.S. passenger vehicles increased from 20 miles per gallon in 2010 to 24.5 miles per gallon in 2020. Average fuel efficiency is expected to increase 31 percent by 2030 (to 32 miles per gallon) and 51 percent by 2040 (to 37 miles per gallon). Electric vehicles, which now account for two percent of passenger vehicles in Virginia, are expected to increase to 46 percent of passenger vehicles in Virginia by 2040.

As a result of increased fuel efficiency and the adoption of electric vehicles, gasoline and diesel consumption in Virginia is expected to decrease 23 percent between 2020 to 2030, and 51 percent by 2040. This decline is expected to decrease Virginia's state motor fuel tax receipts by 34 percent by 2030 and 62 percent by 2040. State diesel fuel tax receipts are expected to decrease 24 percent by 2030 and 50 percent by 2040.

TRANSPORTATION AND ECONOMIC DEVELOPMENT

The health and future growth of Virginia's economy is riding on its transportation system. Each year, $497 billion in goods are shipped to and from sites in Virginia. The value of freight shipped to and from sites in Virginia, in inflation-adjusted dollars, is expected to increase 128 percent by 2045 and 92 percent for goods shipped by trucks, placing an increased burden on the state's already deteriorated and congested network of roads and bridges.

The amount of freight transported in Virginia and the rest of the U.S. is expected to increase significantly as a result of further economic growth, changing business and retail models, increasing international trade, and rapidly changing consumer expectations that place an emphasis on faster deliveries, often of smaller packages or payloads.

According to a report by the American Road & Transportation Builders Association, the design, construction and maintenance of transportation infrastructure in Virginia support approximately 112,000 full-time jobs across all sectors of the state economy. These workers earn $5.2 billion annually. Approximately 1.5 million full-time jobs in Virginia in key industries like tourism, retail sales, agriculture and manufacturing are completely dependent on the state's transportation network.

INTRODUCTION

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 Virginia's transportation system is critical to quality of life and economic competitiveness in the Old Dominion. Inadequate transportation investment, which will result in deteriorated transportation facilities and diminished access, will negatively affect Virginia's economic competitiveness and quality of life.

To accommodate population and economic growth, maintain its level of economic competitiveness and achieve further economic growth, 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 Virginia's roads, highways, bridges and transit systems could also provide a 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 Virginia's roads, highways and bridges, and the state's future mobility needs. Sources of information for this report include the Virginia Department of Transportation, 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), the American Road & Transportation Builders Association (ARTBA), and the National Highway Traffic Safety Administration (NHTSA).

In addition to statewide data, the TRIP report includes regional data for the Hampton Roads, Northern Virginia, Richmond and Roanoke urban areas. An urban area is defined as a region's municipalities and surrounding suburbs for pavement condition and congestion data; bridge and traffic fatality data include a region's major counties.[1]

POPULATION, TRAVEL AND ECONOMIC TRENDS IN VIRGINIA

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

Virginia's population grew to approximately 8.5 million residents in 2018, a 20 percent increase since 2000.[2] Virginia had approximately 5.9 million licensed drivers in 2017.[3] In 2018, the state's

transportation system carried 85.3 billion annual vehicle miles of travel (VMT), a 14 percent increase since 2000 and an increase of six percent from 2013 to 2018.[4] From 2000 to 2018, Virginia's gross domestic product (GDP), a measure of the state's economic output, increased by 38 percent, when adjusted for inflation.[5] U.S. GDP increased 41 percent during the same period.[6]

CONDITION OF VIRGINIA ROADS

The life cycle of 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 Virginia Department of Transportation 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 the data collected is adequate to provide an accurate assessment of pavement conditions on these roads and highways.

Statewide, 34 percent of Virginia's major roads are in poor or mediocre condition. Twelve percent of Virginia's major locally and state-maintained roads are in poor condition and 22 percent are in mediocre condition.[7] Twenty-four percent of Virginia's major roads are in fair condition and the remaining 42 percent are in good condition.[8]

Nineteen percent of Virginia's major locally and state-maintained urban roads and highways have pavements rated in poor condition and 28 percent rated in mediocre condition.[9] Nineteen percent of Virginia's major urban roads are rated in fair condition and the remaining 34 percent are rated in good condition.[10]

Eight percent of Virginia's major locally and state-maintained rural roads and highways have pavements rated in poor condition and 20 percent rated in mediocre condition.[11] Twenty-six percent of Virginia's major rural roads are rated in fair condition and the remaining 46 percent are rated in good condition.[12] The chart below details pavement conditions on major urban roads in the state's largest urban areas and statewide.[13]

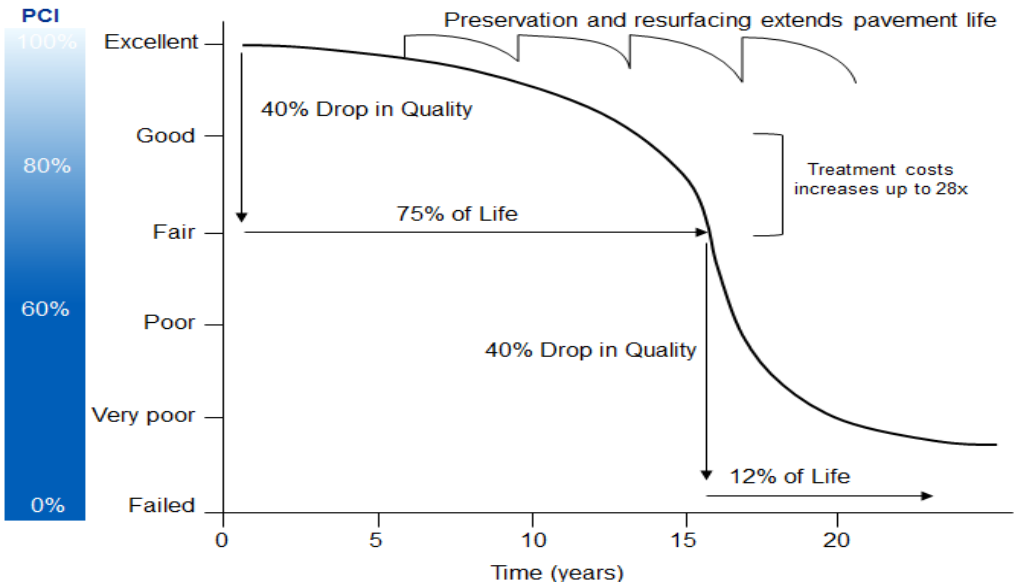
Chart 1. Pavement conditions on major roads in Virginia's largest urban areas and statewide.

Location	Poor	Mediocre	Fair	Good
Hampton Roads	30%	29%	16%	24%
Northern Virginia	16%	27%	20%	36%
Richmond	17%	30%	21%	33%
Roanoke	10%	20%	23%	47%
VIRGINIA STATEWIDE	**12%**	**22%**	**24%**	**42%**

Source: TRIP analysis of Federal Highway Administration data.

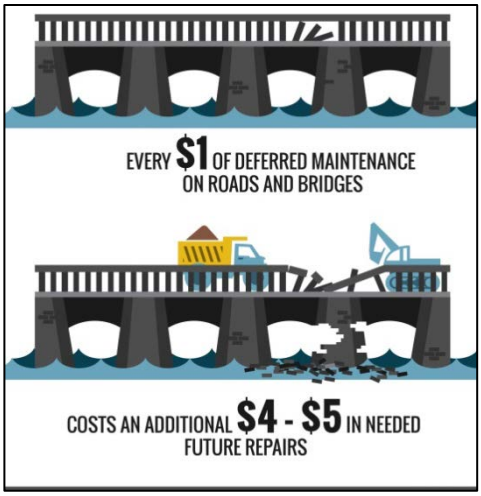
Pavement failure is caused by a combination of traffic, moisture and climate. Moisture often works its way into road surfaces and the materials that form the road's foundation. Road surfaces at intersections are more prone to deterioration because the slow-moving or standing loads occurring at these 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.[14] 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.

Chart 2. Pavement Condition Cycle Time with Treatment and Cost



Source: North Carolina Department of Transportation (2016). 2016 Maintenance Operations and Performance Analysis Report

Long-term repair costs increase significantly when road and bridge maintenance is deferred, as road and bridge deterioration accelerates later in the service life of a transportation facility and requires more costly repairs. A report on maintaining pavements found that every $1 of deferred maintenance on roads and bridges costs an additional $4 to $5 in needed future repairs.[15]



THE COST 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 Virginia motorists as a result of deteriorated road conditions is $2.8 billion annually, an average of $468 per driver statewide.[16] The chart below shows additional VOC per motorist in the state's largest urban areas.

Chart 3. Vehicle operating costs per motorist as a result of driving on deteriorated roads.

Location	VOC
Hampton Roads	$684
Northern Virginia	$485
Richmond	$512
Roanoke	$361
VIRGINIA STATEWIDE	**$2.8 Billion**

Source: TRIP estimates.

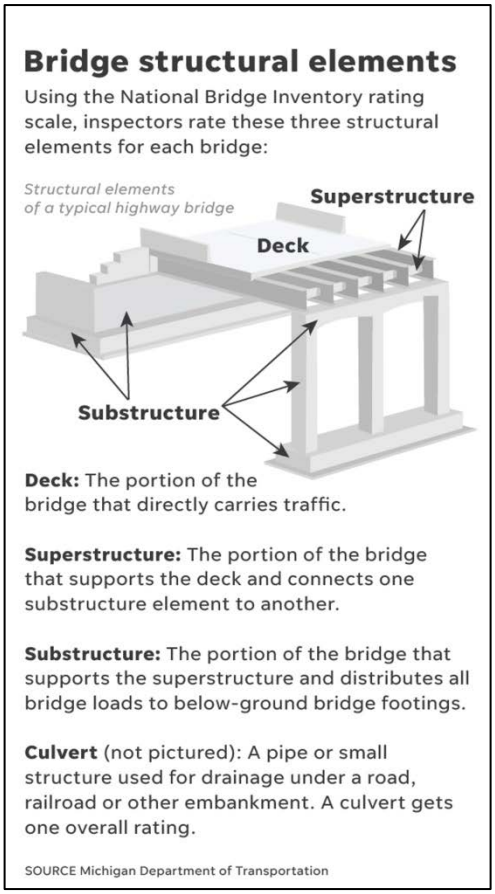
Additional vehicle operating costs have been calculated in the Highway Development and Management Model (HDM), which is recognized by the U.S. Department of Transportation and more than 100 other countries as the definitive analysis of the impact of road conditions on vehicle operating costs. The HDM report is based on numerous studies that have measured the impact of various factors, including road conditions, on vehicle operating costs.[17] 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 driving cost estimates and then using the HDM model to estimate the additional VOC paid by drivers as a result of substandard roads.[18] Additional research on the impact of road conditions on fuel consumption by the Texas Transportation Institute (TTI) is also factored into TRIP's vehicle operating cost methodology.

BRIDGE CONDITIONS IN VIRGINIA

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.



Six hundred and forty-six of Virginia's 13,931 locally and state-maintained bridges are rated in poor/structurally deficient condition.[19] This includes all bridges that are 20 feet or more in length. A bridge is deemed poor/structurally deficient if there is significant deterioration of the bridge deck, supports or other major components.

Bridges that are poor/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.

More than eight thousand (8,499) of Virginia's locally and state-maintained bridges have been rated in fair condition.[20] A fair rating indicates that a bridge's structural elements are sound but minor

deterioration has occurred to the bridge's deck, substructure or superstructure. The remaining 4,786 of the state's bridges are rated in good condition.[21]

The chart below shows the condition of bridges statewide and in Virginia's largest urban areas.

Chart 4. Bridge conditions statewide and in Virginia's largest urban areas.

	Number Poor/ Structurally Deficient	Number Fair	Number Good	Total Bridges
Hampton Roads	52	717	306	1,075
Northern Virginia	30	759	855	1,644
Richmond	59	688	324	1,071
Roanoke	22	441	255	718
VIRGINIA STATEWIDE	**646**	**8,499**	**4,786**	**13,931**

Source: TRIP analysis of Federal Highway Administration National Bridge Inventory (2018).

Most bridges are designed to last 50 years before major overhaul or replacement, although many newer bridges are being designed to last 75 years or longer. In Virginia, 46 percent of the state's bridges were built in 1969 or earlier.[22]

The service life of bridges can be extended by performing routine maintenance such as resurfacing decks, painting surfaces, ensuring 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 VIRGINIA

A total of 3,875 people were killed in Virginia traffic crashes from 2014 to 2018, an average of 775 fatalities per year.[23]

Chart 5. Traffic Fatalities in Virginia 2014 – 2018.

Year	Fatalities
2014	703
2015	753
2016	760
2017	839
2018	820
2014-18 Avg.	**775**
TOTAL	**3,875**

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.

Virginia's overall traffic fatality rate of 0.96 fatalities per 100 million vehicle miles of travel in 2018 is lower than the national average of 1.13.[24] The fatality rate on Virginia's non-interstate rural roads in 2018 was approximately three times higher than on all other roads in the state (2.05 fatalities per 100 million vehicle miles of travel vs. 0.63).[25]

The chart below details the average number of people killed in traffic crashes in the state's largest urban areas between 2016 and 2018, and the cost of traffic crashes per driver.

Chart 6. Average fatalities between 2016 and 2018 and crash cost per driver.

Location	Average Fatalities	Annual Cost Per Driver
Hampton Roads	134	$317
Northern Virginia	53	$83
Richmond	96	$349
Roanoke	34	$457

Source: TRIP analysis.

Traffic crashes in Virginia imposed a total of $6.4 billion in economic costs in 2018.[26] TRIP estimates that roadway features were likely a contributing factor in approximately one-third of all fatal traffic crashes, resulting in $2.1 billion in economic costs in Virginia in 2018.[27] 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.[28]

Improving safety on 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 converting intersections to roundabouts; removing or shielding roadside objects; the addition of left-turn lanes at intersections; the signalization of intersections; adding or improving median barriers; improved lighting; adding centerline or shoulder rumble strips; providing appropriate pedestrian and bicycle facilities, including sidewalks and bicycle lanes; providing wider lanes, wider and paved shoulders; upgrading roads from two lanes to four lanes; providing better road and lane markings; and updating rail crossings.

The U.S. has a $146 billion backlog in needed roadway safety improvements, according to a 2017 report from the AAA Foundation for Traffic Safety. The report found implementing these cost-effective and needed roadway safety improvements on U.S. roadways would save approximately 63,700 lives and reduce the number of serious injuries as a result of traffic crashes by approximately 350,000 over 20 years.

TRAFFIC CONGESTION IN VIRGINIA

Increasing levels of traffic congestion cause significant delays in 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. Increased levels of congestion can also reduce the attractiveness of a location to a company when considering expansion or where to locate a new facility.

Based on TTI analysis, TRIP estimates the total value of lost time and wasted fuel in Virginia is approximately $4.6 billion a year. The chart below shows the number of hours lost annually for each driver in the state's largest urban areas, and the per-driver cost of lost time and wasted fuel due to congestion.

Chart 7. Annual hours lost to congestion and congestion costs per driver.

Location	Hours Lost to Congestion	Annual Cost Per Driver
Hampton Roads	46	$758
Northern Virginia	102	$2,015
Richmond	35	$641
Roanoke	25	$510

Source: Texas Transportation Institute Urban Mobility Report, 2019.

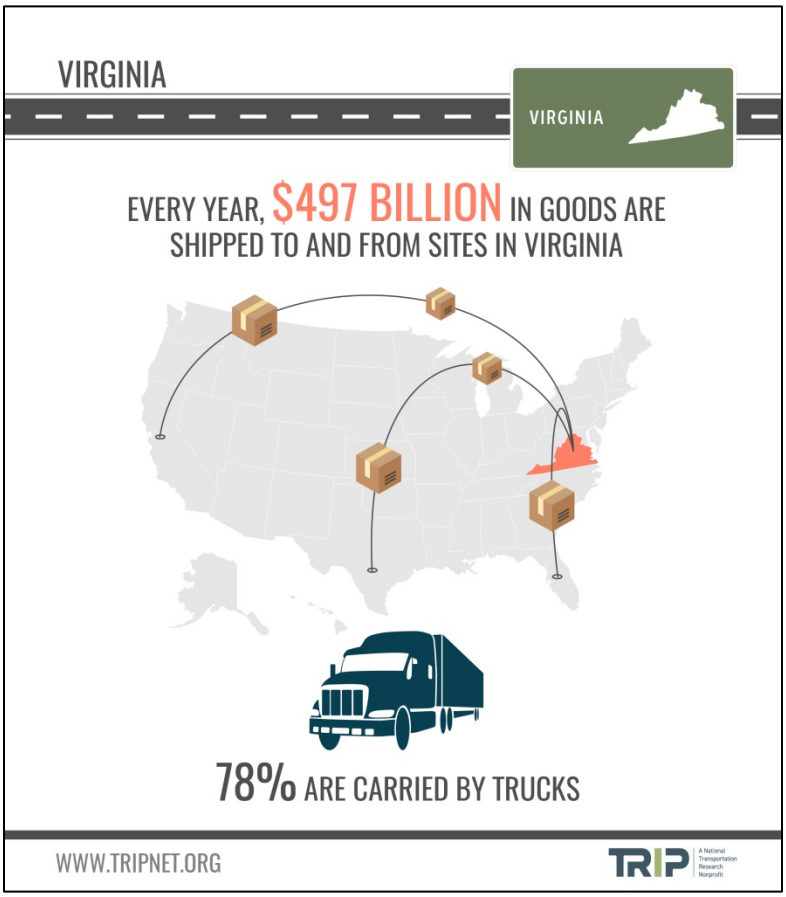
TRANSPORTATION AND ECONOMIC GROWTH

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 Virginia. 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, $497 billion in goods are shipped to and from sites in Virginia.[29] Seventy-eight percent of the goods shipped annually to and from sites in Virginia are carried by truck and another 16 percent are carried by courier services or multiple-mode deliveries, which include trucking.[30] The value of freight shipped to and from sites in Virginia, in inflation-adjusted dollars, is expected to increase 128 percent by 2045 and 92 percent for goods shipped by trucks.[31]



The ability of the nation's freight transportation system to efficiently and safely accommodate the growing demand for freight movement could be hampered by inadequate transportation capacity, a lack of adequate safety features on some transportation facilities, institutional barriers to enhancing the nation's freight facilities, a lack of adequate funding for needed improvements to the freight network and a shortage of drivers.

The need to improve the U.S. freight network is occurring at a time when the nation's freight delivery system is being transformed by advances in vehicle autonomy, manufacturing, warehousing

and supply chain automation, increasing e-commerce, and the growing logistic networks being developed by Amazon and other retail organizations in response to the demand for a faster and more responsive delivery and logistics cycle.

Investments in transportation improvements in Virginia play a critical role in the state's economy. A report by the American Road & Transportation Builders Association found that the design, construction and maintenance of transportation infrastructure supports the equivalent of approximately 112,000 full-time jobs across all sectors of the state economy, earning these workers approximately $5.2 billion annually.[32] These jobs include approximately 56,000 full-time jobs directly involved in transportation infrastructure construction and related activities. Spending by employees and companies in the transportation design and construction industry supports an additional 56,000 full-time jobs in Virginia.[33] Transportation construction in Virginia contributes an estimated $956 million annually in state and local income, corporate and unemployment insurance taxes, and the federal payroll tax.[34]

Approximately 1.5 million full-time jobs in Virginia in key industries like tourism, retail sales, agriculture and manufacturing are dependent on the quality, safety and reliability of the state's transportation infrastructure network. These workers earn $55.2 billion in wages and contribute an estimated $10.1 billion in state and local income, corporate and unemployment insurance taxes, and the federal payroll tax.[35]

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 third highest site selection factor behind the availability of skilled labor and labor costs in a 2018 survey of corporate executives by Area Development Magazine.[36]

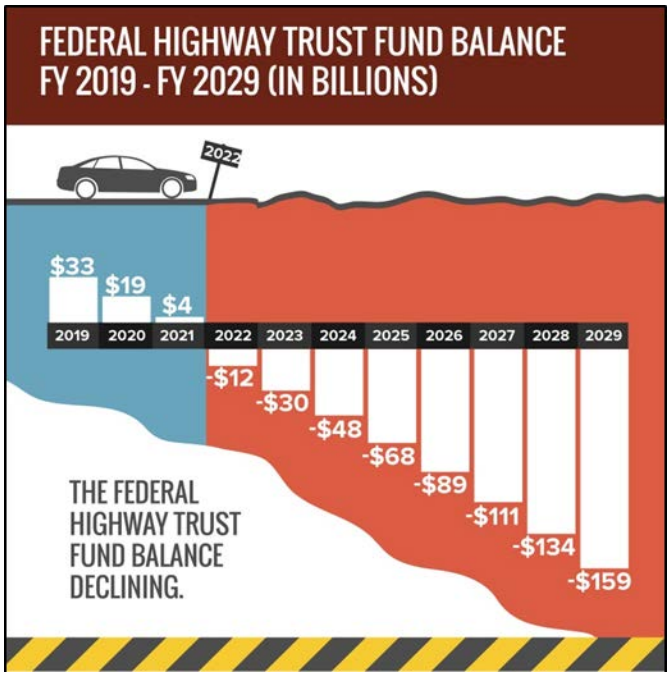
TRANSPORTATION FUNDING IN VIRGINIA

Investment in 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.

In 2019 the Virginia General Assembly required that the Virginia Secretary of Transportation and the Commonwealth Transportation Board evaluate the sustainability of the state's transportation revenue sources and identify potential options to provide a sustainable source of transportation funding. The evaluation found that the revenues from the state's motor fuel tax are not keeping pace with the use of the state's transportation system as a result of increasing vehicle fuel efficiency and the increasing use of electric vehicles.

From 2016 to 2018, Virginia vehicle miles of travel increased by 3.2 percent. However, during the same period state fuel tax collections decreased by 0.4 percent. In fiscal year 2018 state motor fuel tax revenues in Virginia would have been $31 million higher if they had kept pace with vehicle miles of travel.[37]

The average fuel efficiency of U.S. passenger vehicles increased from 20 miles per gallon in 2010 to 24.5 miles per gallon in 2020. Average fuel efficiency is expected to increase another 31 percent by 2030, to 32 miles per gallon, and increase 51 percent by 2040, to 37 miles per gallon.[38] Electric vehicles, which now account for two percent of passenger vehicles in Virginia, are expected to increase to 46 percent of passenger vehicles in Virginia in 2040.[39]



As a result of increased fuel efficiency and the adoption of electric vehicles, gasoline and diesel consumption in Virginia is expected to decrease by 23 percent between 2020 to 2030 and by 51 percent by 2040.[40] This decline is expected to decrease Virginia state motor fuel tax receipts by 34 percent by 2030 and 62 percent by 2040, and state diesel fuel tax receipts by 24 percent by 2030 and 50 percent by 2040.[41]

The federal government is another critical source of funding for 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 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.[42]

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.[43] 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 Status of the Nation's Highways, Bridges, and Transit, 23rd Edition, submitted to Congress by the United States Department of Transportation (USDOT) in 2019, the nation faces a $786 billion backlog in needed repairs and improvements to the nation's roads, highways and bridges.[44] This backlog includes $435 billion for highway rehabilitation; $125 billion for bridge rehabilitation; $120 billion for system expansion and $106 billion for system enhancement.[45] The USDOT report found that the nation's current $105 billion investment in roads, highways and bridges by all levels of government should be increased by 29 percent to $136 billion annually to improve the conditions of roads, highways and bridges, relieve traffic congestion and improve traffic safety.

CONCLUSION

As Virginia works to enhance its thriving, growing and dynamic state, it will be critical that it is able to provide a 21st century network of roads, highways, bridges and transit that can accommodate the mobility demands of a modern society.

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 would provide a 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.

Numerous projects to improve the condition and expand the capacity of Virginia's roads, highways, bridges and transit systems will not be able to proceed without a substantial boost in local, state or federal transportation funding. If 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.

# # #

ENDNOTES

[1] Bridge condition data and safety data for each urban area includes the counties and municipalities noted: Hampton Roads- Chesapeake City, Hampton City, Newport News City, Norfolk City, Portsmouth City, Suffolk City, Virginia Beach City, James City, Gloucester County, Isle of Wight County, Matthews County and York County; Northern Virginia - Arlington County, Alexandria City, Fairfax County, Fairfax City, Loudon County, Manassas and Prince William County; Richmond – Richmond City, Richmond County, Henrico County, Chesterfield County, Powhatan County, Goochland County, Hanover County and Charles City; Roanoke – Botetourt County, Craig County, Franklin County, Roanoke City and Roanoke County.
[2] U.S. Census Bureau (2018).
[3]Highway Statistics (2018). Federal Highway Administration. DL-1C.
[4] U.S. Department of Transportation - Federal Highway Administration: Highway Statistics 2013 and 2018 and analysis of Federal Highway Administration Traffic Volume Trends (2018)
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