Keeping West Virginia Moving Forward: Progress & Challenges in Achieving a 21st Century Transportation System

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.

Executive Summary

Mobility, accessibility and connectivity are critical factors in a state's quality of life and economic competitiveness. The growth and development of a state or region hinges on efficient and safe access to employment, customers, commerce, recreation, education and healthcare via multiple transportation modes. The quality of life and the pace of a state's economic growth are directly tied to the condition, efficiency, safety and resiliency of its transportation system.

An adequate and reliable source of transportation funding is critical to providing a system of roads, highways and bridges to support commerce within West Virginia and connect the state to markets around the globe, while providing the safe, smooth and efficient mobility that residents require.

TRIP's "Keeping West Virginia Moving Forward" report examines the condition, use, safety and efficiency of West Virginia's surface transportation system, the impact of additional transportation funding, and the importance of additional funds from the federal surface transportation program. The report also looks at the challenges West Virginia faces to maintain the existing system, sustain adequate state funding despite the potential of increasing fuel efficiency standards, increasing inflation, and the adoption of electric vehicles. Sources of information for this report include the West Virginia Department of Transportation (WVDOT), 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), the American Road & Transportation Builders Association (ARTBA), and the National Highway Traffic Safety Administration (NHTSA).

WEST VIRGINIA'S TRANSPORTATION SYSTEM AND 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.

In 2015 a report by the West Virginia Blue Ribbon Commission on Highways found that West Virginia needed to increase its annual investment in its highway and bridge system by $750 million annually for needed repairs and an additional $380 million annually for needed expansion to the system – a total of 502approximately $1.1 billion annually. In 2017 the West Virginia legislature approved increases in the state's motor fuel, registration fees, and taxes on new car purchases to support additional highway investment. State voters subsequently approved a referendum 73 to 27 percent allowing the state to borrow up to $1.6 billion to fund Governor Jim Justice's Roads to Prosperity Initiative.

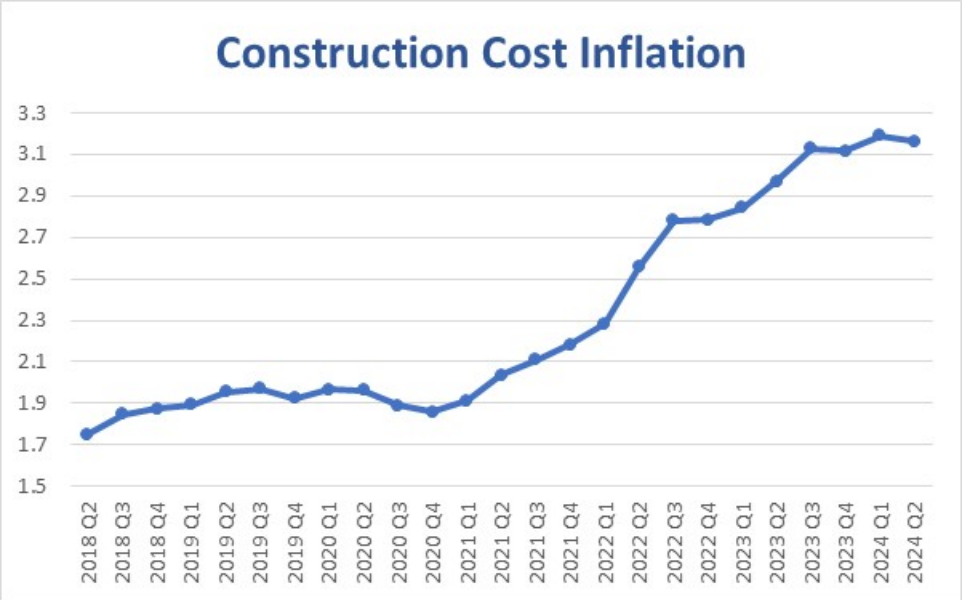
Due to the increase in available funds, WVDOT was able to increase the annual amount of investment in road, highway and bridge repairs and improvements by 67 percent from 2018 to 2023, from $678 million to $1.132 billion. Since 2018, WVDOT has repaved nearly 8,400 miles of roadway and made repairs to more than 3,400 bridges. However, the annual amount owed by the state in bond re-payments has increased from $25 million in 2018 to $136 million in 2024.

The Infrastructure Investment and Jobs Act (IIJA), signed into law in November 2021, will provide $3.6 billion in state funds for highway, bridge and transit investments in West Virginia over five years, including a 61 percent funding increase in FY 2022. Federal funds currently provide 38 percent of the revenue used by WVDOT to fund highway and bridge improvements. The IIJA expires on September 30, 2026.

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. The share of electric vehicles

of total passenger vehicle sales in the U.S. is expected to increase from eight percent in 2024 to 49 percent by 2030.

Increasing inflation has also hampered West Virginia's ability to complete needed projects and improvements, as the available funding now covers significantly less work. The Federal Highway Administration's national highway construction cost index, which measures labor and materials cost, increased by 45 percent from the beginning of 2022 through the second quarter of 2024.



ROAD CONDITIONS IN WEST VIRGINIA

Statewide, nearly one-third of West Virginia's major roads are in poor or mediocre condition. Eight percent of West Virginia's major locally and state-maintained roads are in poor condition and 22 percent are in mediocre condition. Twenty-one percent of West Virginia's major roads are in fair condition and the remaining 49 percent are in good condition. The chart below details pavement conditions on major roads in the state's largest urban areas and statewide.

Location	Poor	Mediocre	Fair	Good
Beckley	4%	10%	16%	69%
Charleston	11%	17%	18%	54%
Huntington	9%	14%	16%	62%
Morgantown	29%	22%	13%	36%
Parkersburg	6%	14%	20%	60%
Weirton-Steubenville	18%	17%	16%	49%
Wheeling	10%	21%	18%	51%
West Virginia Statewide	**8%**	**22%**	**21%**	**49%**

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 $577 million annually, an average of $502 per driver statewide.

BRIDGE CONDITIONS IN WEST VIRGINIA

Nineteen percent of West Virginia's bridges are rated in poor/structurally deficient condition, the highest share in the nation. Bridges that are rated poor/structurally deficient have significant deterioration of the bridge deck, supports or other major components. Fifty-six percent of the state's bridges are rated in fair condition and the remaining 25 percent 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 West Virginia, 30 percent of the state's bridges are 50 years or older.

The chart below details bridge conditions statewide and in the state's largest urban areas.

	Poor/Structurally Deficient		Fair		Good		Total Bridges
	Number	Share	Number	Share	Number	Share	
Beckley	55	25%	158	71%	11	5%	224
Charleston	69	12%	371	67%	114	21%	554
Huntington	90	15%	378	61%	151	24%	619
Morgantown	41	20%	87	43%	75	37%	203
Parkersburg	60	12%	164	34%	265	54%	489
Weirton-Steubenville	37	12%	153	49%	122	39%	312
Wheeling	72	14%	229	45%	209	41%	510
West Virginia Statewide	**1,370**	**19%**	**4,123**	**56%**	**1,855**	**25%**	**7,348**

TRAFFIC CONGESTION IN WEST VIRGINIA

Congested roads, highways and bottlenecks choke commuting and commerce and cost West Virginia drivers $400 million each year in the form of lost time and wasted fuel. Vehicle miles of travel on West Virginia's roads, highways and bridges increased by six percent from 2022 to 2024.

The chart below details the annual hours lost to congestion, congestion costs per driver and the average amount of fuel per driver wasted annually due to congestion in the state's largest urban areas.

Urban Area	Hours Lost to Congestion	Annual Cost Per Driver	Gallons of Fuel Wasted Per Driver
Beckley	15	$386	4
Charleston	26	$744	16
Huntington	15	$365	6
Morgantown	16	$404	8
Parkersburg	13	$304	5
Weirton-Steubenville	21	$570	10
Wheeling	39	$1,069	18

Congestion on West Virginia's major highways and roads hampers the state's ability to support economic development and quality of life by reducing the reliability and efficiency of personal and commercial travel, including the transport of goods and services. Traffic congestion robs commuters of time and money and imposes increased costs on businesses, shippers and manufacturers, which are often passed along to consumers. Increased levels of congestion can also reduce the attractiveness of a location when a company is considering expansion or deciding where to locate a new facility.

TRAFFIC SAFETY IN WEST VIRGINIA

From 2019 to 2023, 1,340 people were killed in traffic crashes in West Virginia, an average of 268 fatalities per year. The state's 2023 traffic fatality rate of 1.64 fatalities for every 100 million miles traveled was the fifth highest in the U.S. and higher than the national average of 1.26. The traffic fatality rate per 100 million vehicle miles of travel in 2022 on West Virginia's rural non-Interstate roads was nearly double that on all other roads in the state (2.41 vs. 1.25).

Traffic crashes in West Virginia imposed a total of $1.8 billion in economic costs in 2023. TRIP estimates that roadway features, while not the primary factor, were likely a contributing factor in approximately one-third of all fatal traffic crashes, resulting in $596 million in economic costs in West Virginia in 2023.

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.

Nationwide, traffic fatalities began to increase dramatically in 2020 even as vehicle travel rates plummeted due to the COVID-19 pandemic, and the number of fatalities continued to increase in 2021. The number of fatalities in West Virginia increased from 260 in 2019 to as high as 282 in 2021, before falling slightly to 267 in 2023. The state's fatality rate per 100 million VMT increased from 1.36 in 2019 to 1.64 in 2023, an increase of 21 percent.

WEST VIRGINIA TRAFFIC FATALITY AND FATALITY RATES, 2019-2023						
	2019	2020	2021	2022	2023	2019-2022 Change
Traffic Fatalities	260	267	282	264	267	3%
Fatalities per 100M VMT	1.36	1.66	1.75	1.72	1.64	21%

In 2022 the U.S. Department of Transportation adopted a comprehensive National Roadway Safety Strategy, a roadmap for addressing the nation's roadway safety crisis based on a Safe System approach. The Safe System approach, which is also being adopted by state and local transportation agencies has five objectives: Safer People, Safer Roads, Safer Vehicles, Safer Speeds, and improved Post-Crash Care.

FREIGHT TRANSPORTATION IN WEST VIRGINIA

The health and future growth of West Virginia's economy is riding on its surface transportation system. Each year 307 billion tons of freight, valued at $126 billion, are shipped to or from sites in West Virginia.

The amount of freight transported in West Virginia and the rest of the U.S. is expected to increase significantly as a result of 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. The amount of freight shipped annually to and from sites in West Virginia is anticipated to increase by 88 percent by value 25 percent by weight by 2050.

THE IMPACT OF TRANSPORTATION INVESTMENT ON ECONOMIC GROWTH IN WEST VIRGINIA

According to a report by the American Road & Transportation Builders Association, the design, construction and maintenance of transportation infrastructure in West Virginia supports approximately 24,000 full-time jobs across all sectors of the economy. These workers earn $588 million annually. Approximately 332,000 full-time jobs in West Virginia in key industries like tourism, retail sales, agriculture and manufacturing are completely dependent on the state's transportation network.

Sources of information for this report include the Federal Highway Administration (FHWA), the West Virginia Department of Transportation (WVDOT), the American Association of State Highway and Transportation Official (AASHTO), the American Road and Transportation Builders Association (ARTBA), the Bureau of Transportation Statistics (BTS), the U.S. Census Bureau, the Center for Transportation Studies, the Texas Transportation Institute (TTI) and the National Highway Traffic Safety Administration (NHTSA). Cover photo credit: WVDOT. All data used in the report are the most recent available.

Introduction

The quality of life of a state's residents and the economic success and competitiveness of businesses are inextricably linked to the condition, safety, efficiency and resiliency of its transportation network. West Virginia relies on a diverse economy including energy extraction, healthcare, manufacturing, tourism and education. A safe, well-maintained and reliable network of roads and bridges is critical to each of these sectors and to the economic health of the state and the nation.

Adequate and reliable transportation funding is critical to providing a system of roads, highways and bridges that will support commerce within West Virginia and connect the state to markets around the globe, while providing the safe, smooth and efficient mobility that residents require.

Following a 2015 Blue Ribbon Commission report that found the state needed to increase annual investment in its transportation system by approximately $1.1 billion annually, in 2017 the West Virginia legislature approved increases in the state's motor fuel, registration fees, and taxes on new car purchases to support additional highway investment. State voters subsequently approved a referendum 73 to 27 percent allowing the state to borrow up to $1.6 billion to fund Governor Jim Justice's Roads to Prosperity Initiative. As a result of the additional funding, the West Virginia Department of Transportation (WVDOT) was able to increase its annual investment in road, highway and bridge repairs and improvements from $678 million in 2018 to $1.132 billion in 2023.

West Virginia transportation funding was further boosted in 2021 by the passage of the Infrastructure Investment and Jobs Act (IIJA), which has increased federal highway, bridge and transit funding in West Virginia by approximately 61 percent. The IIJA expires on September 30, 2026. While this additional transportation investment will allow West Virginia to make significant progress on transportation improvements, many additional needed projects will not proceed due to a lack of available funding.

Population, Travel and Economic Trends in West Virginia

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

West Virginia's population reached approximately 1.8 million residents in 2024.[1] West Virginia had approximately 1.1 million licensed drivers in 2022.[2] From 2000 to 2023 West Virginia's gross domestic product (GDP), a measure of the state's economic output, increased by 21 percent when adjusted for inflation.[3] U.S. GDP, adjusted for inflation, increased 48 percent during this period.[4]

Due to the COVID-19 pandemic, vehicle travel in West Virginia dropped by as much as 40 percent in April 2020 (as compared to vehicle travel during the same month the previous year).[5] From 2022 to 2024 vehicle travel in West Virginia increased by six percent.[6]

Road Conditions in West Virginia

The life cycle of West Virginia's roads is greatly affected by 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 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 ensure the data collected is adequate to provide an accurate assessment of pavement conditions on these roads and highways.

Eight percent of West Virginia's major locally and state-maintained roads and highways have pavements rated in poor condition and 22 percent are in mediocre condition.[7] Twenty-one percent of West Virginia's major roads are rated in fair condition and the remaining 49 percent are rated in good condition.[8]

Fourteen percent of West Virginia's major locally and state-maintained urban roads and highways have pavements rated in poor condition and 20 percent are in mediocre condition.[9] Eighteen percent of West Virginia's major urban roads are rated in fair condition and the remaining 48 percent are rated in good condition.[10]

Six percent of West Virginia's major locally and state-maintained rural roads and highways have pavements rated in poor condition and 22 percent are in mediocre condition.[11] Twenty-two percent of West Virginia's major rural roads are rated in fair condition and the remaining 49 percent are rated in good condition.[12]

The chart below details pavement conditions on major roads in the state's largest urban areas and statewide.[13]

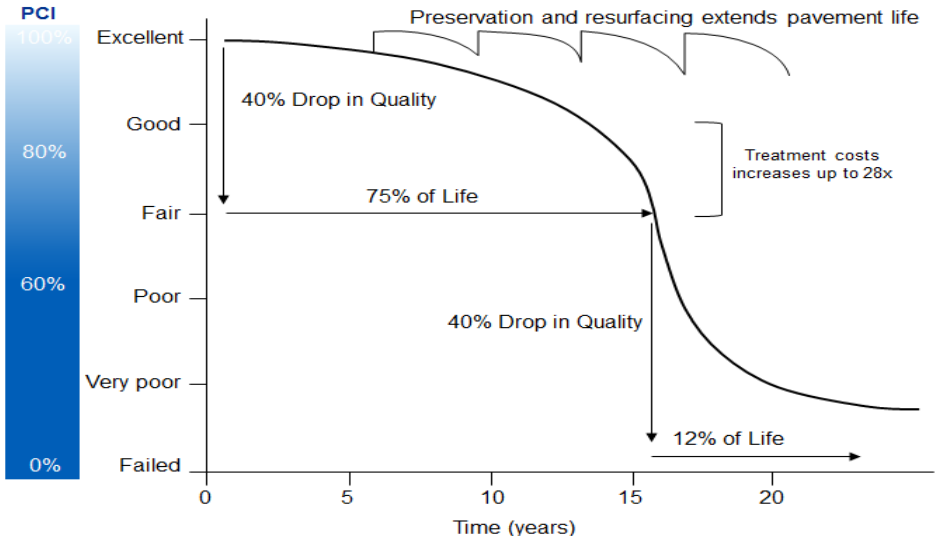
Chart 1. Pavement conditions on major roads in West Virginia's largest urban areas and statewide.

Location	Poor	Mediocre	Fair	Good
Beckley	4%	10%	16%	69%
Charleston	11%	17%	18%	54%
Huntington	9%	14%	16%	62%
Morgantown	29%	22%	13%	36%
Parkersburg	6%	14%	20%	60%
Weirton-Steubenville	18%	17%	16%	49%
Wheeling	10%	21%	18%	51%
West Virginia Statewide	**8%**	**22%**	**21%**	**49%**

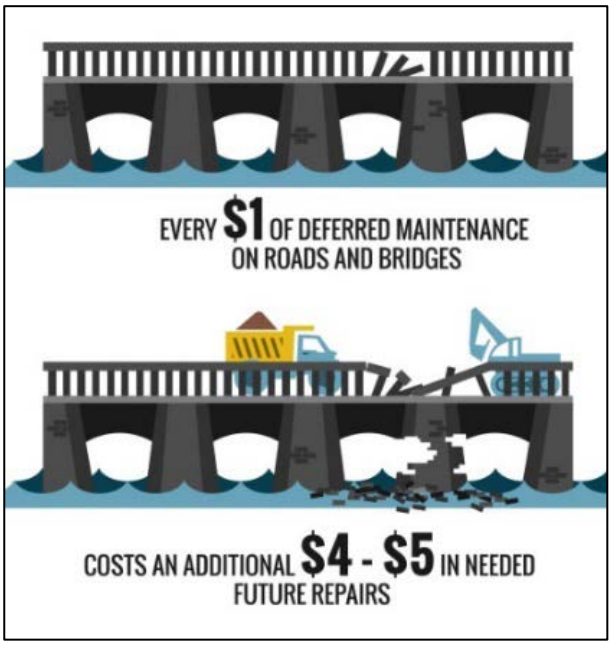
Source: TRIP analysis of Federal Highway Administration data.

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 of Inadequate Road Conditions in West Virginia

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 $577 million annually, an average of $502 per driver statewide.[16] The chart below details additional VOC per motorist in the state's largest urban areas.

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

Location	VOC
Beckley	$272
Charleston	$482
Huntington	$397
Morgantown	$875
Parkersburg	$376
Weirton-Steubenville	$625
Wheeling	$493
West Virginia Statewide	**$577 million**

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.

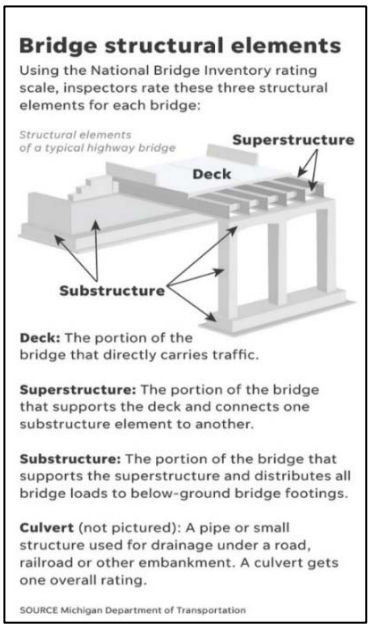
TRIP's additional VOC estimate is based on taking the average number of miles driven annually by a motorist, calculating current VOC based on AAA's driving cost estimates and then using the HDM model to estimate the additional VOC paid by drivers as a result of substandard roads.[18] Additional research 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 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.

Nineteen percent (1,370 of 7,348) of West Virginia's locally and state-maintained bridges are rated in poor/structurally deficient condition, the highest share in the nation.[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. Fifty-six percent of West 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 25 percent of the state's bridges are rated in good condition.[21]

The chart below shows the condition of bridges statewide and in West Virginia's largest urban areas.[22]

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

	Poor/Structurally Deficient		Fair		Good		Total Bridges
	Number	Share	Number	Share	Number	Share	
Beckley	55	25%	158	71%	11	5%	224
Charleston	69	12%	371	67%	114	21%	554
Huntington	90	15%	378	61%	151	24%	619
Morgantown	41	20%	87	43%	75	37%	203
Parkersburg	60	12%	164	34%	265	54%	489
Weirton-Steubenville	37	12%	153	49%	122	39%	312
Wheeling	72	14%	229	45%	209	41%	510
West Virginia Statewide	**1,370**	**19%**	**4,123**	**56%**	**1,855**	**25%**	**7,348**

Source: TRIP analysis of Federal Highway Administration National Bridge Inventory (2024).

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 West Virginia, 30 percent of the state's bridges are 50 years or older.[23] 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 Congestion in West Virginia

While traffic congestion is largely constrained to the state's urban areas, congestion on West Virginia's major highways and roads hampers the state's ability to support economic development and quality of life by reducing the reliability and efficiency of personal and commercial travel, including the transport of goods and services. Traffic congestion robs commuters of time and money and imposes increased costs on businesses, shippers and manufacturers, which are often passed along to consumers. Increased levels of congestion can also reduce the attractiveness of a location when a company is considering expansion or deciding where to locate a new facility.

Based on calculations by the Texas Transportation Institute that analyze urban traffic congestion levels and provide estimates on the amount of time and the value of lost time and wasted fuel as a result of traffic congestion, TRIP has estimated in the following chart the average number of hours lost annually for each driver, the per-driver cost of lost time and wasted fuel due to congestion and the average amount of fuel per driver wasted annually in 2024 due to congestion in each of West Virginia's largest urban areas.

Chart 5. 2024 Annual hours and fuel lost to congestion and congestion costs per driver.

Urban Area	Hours Lost to Congestion	Annual Cost Per Driver	Gallons of Fuel Wasted Per Driver
Beckley	15	$386	4
Charleston	26	$744	16
Huntington	15	$365	6
Morgantown	16	$404	8
Parkersburg	13	$304	5
Weirton-Steubenville	21	$570	10
Wheeling	39	$1,069	18

Source: TRIP estimate based on Texas Transportation Institute Analysis.

Based on the TTI report, TRIP estimates that the total cost of traffic congestion in West Virginia in 2024 in the form of lost time and wasted fuel is $400 million annually.[24] Increasing congestion on West Virginia's major highways and roads hampers the state's ability to support economic development and quality of life by reducing the reliability and efficiency of personal and commercial travel, including the transport of goods and services.

Traffic Safety in West Virginia

A total of 1,340 people were killed in West Virginia traffic crashes from 2019 to 2023, an average of 268 fatalities per year.[25] West Virginia's 2023 traffic fatality rate of 1.64 fatalities per 100 million vehicle miles of travel is significantly higher than the national average of 1.26 and the fifth highest in the nation.[26] The traffic fatality rate per 100 million vehicle miles of travel on West Virginia's rural non-Interstate roads was nearly double that on all other roads in the state (2.41 vs. 1.25).[27]

Nationwide, traffic fatalities began to increase dramatically in 2020 even as vehicle travel rates plummeted due to the COVID-19 pandemic, and the number of fatalities continued to increase in 2021. The number of fatalities in West Virginia increased from 260 in 2019 to as high as 281 in 2021 before falling to 267 in 2023. The state's fatality rate per 100 million VMT increased from 1.36 in 2019 to 1.64 in 2023 – an increase of 21 percent.[28]

Chart 6. West Virginia traffic fatality and VMT data, 2019-2023.

WEST VIRGINIA TRAFFIC FATALITY AND FATALITY RATES, 2019-2023						
	2019	2020	2021	2022	2023	2019-2022 Change
Traffic Fatalities	260	267	282	264	267	3%
Fatalities per 100M VMT	1.36	1.66	1.75	1.72	1.64	21%

Source: National Highway Traffic Safety Administration and Federal Highway Administration.

The significant increase in traffic fatalities since the onset of the pandemic appears largely related to increased risks being taken by drivers. In an October 2021 report, the National Highway Traffic Safety Administration found that "after the declaration of the public health emergency in March 2020, driving patterns and behaviors in the United States changed significantly. Of the drivers who remained on the roads, some engaged in riskier behavior, including speeding, failure to wear seat belts, and driving under the

influence of alcohol or drugs."[29]The AAA Foundation for Traffic Safety (AAAFTS) drew similar conclusions about the role of increased risks being taken by drivers during the pandemic. A survey taken of drivers in October and November 2020 by the AAAFTS asked whether their level of driving had decreased, remained the same or increased since the beginning of COVID-19 related restrictions, and whether the motorist had engaged in a variety of risky driving behaviors in the previous 30 days.[30] In a February 2022 brief about the survey, the AAAFTS noted that drivers who maintained or increased their pre-COVID travel levels indicated that they were more likely to engage in risky driving behavior, including speeding, not wearing a seat belt, being impaired and driving aggressively. "It is possible that many of the individuals who were willing to travel—and even increase their travel—despite the health risks associated with the pandemic were already more willing than average to take other risks," the AAAFTS report found.[31]

In 2022 the U.S. Department of Transportation adopted a comprehensive National Roadway Safety Strategy, a roadmap for addressing the nation's roadway safety crisis based on a Safe System approach that acknowledges the following: humans make mistakes and are physically vulnerable; traffic deaths and serious injuries are unacceptable; traffic deaths and serious injuries need to be reduced by the provision of a redundant transportation system that reduces or minimizes crashes and ensures that, if crashes do occur, they do not result in serious injury or death.[32]

Chart 7. The Safe System Approach

Source: US Department of Transportation.

The Safe System approach, which is also being adopted by state and local transportation agencies has five objectives:

- Safer People: Encourage safe, responsible behavior by people who use our roads, and create conditions that prioritize their ability to reach their destination unharmed.
- Safer Roads: Design roadway environments to mitigate human mistakes and account for injury tolerances, to encourage safer behaviors, and to facilitate safe travel by the most vulnerable users.
- Safer Vehicles: Expand the availability of vehicle systems and features that help to prevent crashes and minimize the impact of crashes on both occupants and non-occupants.

- Safer Speeds: Promote safer speeds in all roadway environments through a combination of thoughtful, context-appropriate roadway design, targeted education and outreach campaigns, and enforcement.
- Post-Crash Care: Enhance the survivability of crashes through expedient access to emergency medical care, while creating a safe working environment for vital first responders and preventing secondary crashes through robust traffic incident management practices.

Improving safety on the nation's roadways will require that additional steps are taken to make further progress in achieving the Safe System's objectives. NHTSA, which provides states with roadway safety grants, requires states to submit annually a state highway safety plan. The state plans outline numerous steps states are taking to improve traffic safety. Elements of these state roadway safety plans aimed at addressing the Safe System objectives include:

- Safer People: education on speeding, impaired or disadvantaged driving; education on safe pedestrian and bicycling behavior; education on driving safely around large commercial vehicles; enforcement of commercial driver license and vehicle weight requirements; extension of safety belt laws and their enforcement to include all passenger vehicle occupants; enhancing enforcement action of speeding, impaired, aggressive and distracted driving, particularly at high-risk locations; increase penalties, particularly for repeat offender drivers; and increased enforcement at work zones.
- Safer Roads: converting intersections to roundabouts; removing or shielding roadside objects; the addition of left-turn lanes at intersections; improved signalization and lighting at intersections; adding or improving median barriers; improved roadway lighting; adding centerline or shoulder rumble strips; improving pedestrian and bicycle facilities, including sidewalks and bike lanes and providing pedestrian crossing islands; improved work zone safety measures; wider lanes and paved shoulders; upgrading roads from two lanes to four lanes; providing or improving lane markings; updating rail crossings; eliminating vertical pavement drop-offs; and providing large truck parking spaces.
- Safer Vehicles: Support the development, testing and deployment of connected and autonomous vehicle technology such as collision avoidance, lane departure avoidance systems and turning detection systems.
- Safer Speeds: Where appropriate, provide roadway features to encourage safer speeds, including traffic roundabouts and curb extensions; improved signage and dynamic speed signing at high-risk locations; education on the consequences of speeding; and increased speeding enforcement, particularly at high-risk locations.
- Post-Crash Care: Reduce crash response time including the use of emergency vehicle preemption technology; improve emergency response to multi-vehicle or hazardous material crashes; and increase access to level one or two trauma centers for seriously-injured crash victims.

Traffic crashes in West Virginia imposed a total of $1.8 billion in economic costs in 2023.[33] TRIP estimates that roadway features, while not the primary factor, were likely a contributing factor in approximately one-third of all fatal traffic crashes, resulting in $596 million in economic costs in West Virginia in 2023.[34] According to a 2023 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.[35]

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.

Transportation Funding in West Virginia

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.

In 2015 a report by the West Virginia Blue Ribbon Commission on Highways found that West Virginia needed to increase its annual investment in its highway and bridge system by $750 million annually for needed repairs and an additional $380 million annually for needed expansion to the system – a total of approximately $1.1 billion annually.[36]

In 2017 the West Virginia legislature approved increases in the state's motor fuel, registration fees, and taxes on new car purchases to support additional highway investment. State voters subsequently approved a referendum 73 to 27 percent allowing the state to borrow up to $1.6 billion to fund Governor Jim Justice's Roads to Prosperity Initiative.

Due to the increase in available funds, the annual amount of investment by WVDOT in road, highway and bridge repairs and improvements rose by 67 percent from 2018 to 2023, from $678 million to $1.132 billion.[37] From 2018 through 2023, WVDOT has been able to re-pave 8,389 miles of road and make repairs to 3,409 bridges.[38] However, the annual amount the state owes in bond re-payments has increased from $25 million in 2018 to $136 million in 2024.[39]

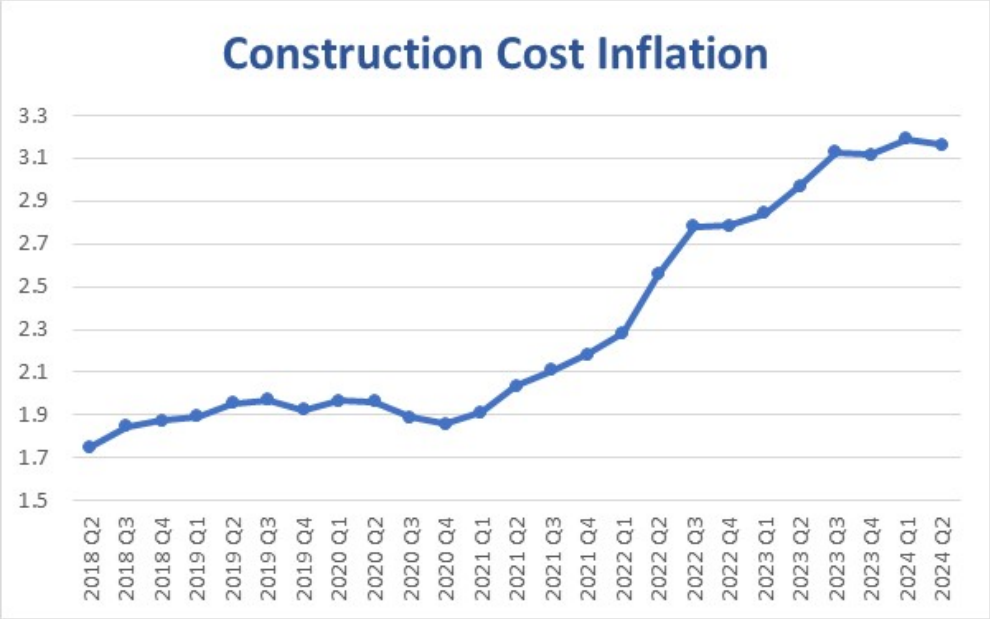
The Infrastructure Investment and Jobs Act (IIJA), signed into law by President Biden in November 2021, will provide $3.6 billion in state funds for highway, bridge and transit investments in West Virginia over the next five years, including a 61% funding increase in FY 2022. Federal funds currently provide 38 percent of the revenue used by WVDOT to fund highway and bridge improvements.

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 (additional revenue is generated by fees on the sale of large trucks, a highway use tax levied on vehicles in excess of 55,000 pounds and a tax on the sale of large truck tires).

Revenue from West Virginia's motor fuel tax – a critical source of state transportation funding -- is likely to erode as a result of increasing vehicle fuel efficiency, the increasing use of electric vehicles and the impact of highway construction inflation. 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.[40] The share of electric vehicles of total passenger vehicle sales in the U.S. is expected to increase from eight percent in 2024 to 49 percent by 2030.[41]

Increasing inflation has also hampered West Virginia's ability to complete needed projects and improvements, as the available funding now covers significantly less work. The Federal Highway Administration's national highway construction cost index, which measures labor and materials cost, increased by 45 percent from the beginning of 2022 through the second quarter of 2024.[42]

Chart 11. FHWA's national highway construction cost index.



Source: Federal Highway Administration.

Freight Transportation in West Virginia

Today's culture of business demands that an area has 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, including its highways, railroads, air and maritime ports, 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 economic development in West 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.

The amount of freight transported in West Virginia, and the rest of the U.S., is expected to increase significantly as a result of 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.

Every year, $126 billion in goods are shipped to and from sites in West Virginia, mostly by truck.[43] Sixty-five percent of the goods shipped annually to and from sites in West Virginia are carried by truck and another 14 percent are carried by courier services or multiple-mode deliveries, which include trucking.[44]

The amount of freight shipped annually to and from sites in West Virginia by trucks is anticipated to increase by 88 percent by value and 25 percent by weight by 2050.[45]

Accommodating the significant increase expected in the movement of truck freight in West Virginia will be further challenged by the significant number of freight routes in the state that are constrained because they have inadequate load carrying capacity to accommodate large trucks.

The ability of West Virginia's and the nation's freight transportation system to accommodate the growing demand for freight movement efficiently and safely 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.

The Importance of Transportation to Economic Growth in West Virginia

Investments in transportation improvements in West 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 24,000 full-time jobs across all sectors of the state economy, earning these workers approximately $588 million annually.[46] These jobs include approximately 12,000 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 12,000 full-time jobs in West Virginia.[47] Transportation construction in West Virginia contributes an estimated $107 million annually in state and local income, corporate and unemployment insurance taxes and the federal payroll tax.[48]

Approximately 332,000 full-time jobs in West 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 approximately $12.4 billion in wages and contribute an estimated $2.3 billion in state and local income, corporate and unemployment insurance taxes and the federal payroll tax.[49]

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 access has a significant impact on the competitiveness of a region's economy. In a 2023 survey of corporate executives by Area Development Magazine, 78 percent of corporate executives said that highway accessibility was an important or very important factor in making decisions about expansion or investment.[50]

Improving Transportation Safety, Resiliency and Efficiency

Recognizing that extreme weather, sea level change, and changes in environmental conditions may threaten the condition and longevity of the nation's transportation infrastructure, transportation agencies have begun to assess vulnerabilities and consider the resilience of their transportation assets during the

transportation planning process. Transportation agencies across the country have begun to incorporate resilience in asset management plans, addressing resilience in project development and design and optimizing operations and maintenance practices.[51]

Based on the importance of maximizing the level and safety of mobility provided by its transportation system, transportation agencies are adopting Transportation Systems Management and Operations (TSMO) practices and incorporating improved resiliency into their transportation network. While a TSMO program does not eliminate the need for capacity expansions along some routes, it helps enhance the mobility of an existing corridor as much as possible.

A TSMO program adopts an integrated set of strategies to improve traffic flow and safety on a portion of a roadway, including work zone management, traffic incident management, freight management, traveler information, traffic signal coordination, ramp management, transit management and improved bicycle and pedestrian crossings.[52] The benefits of TSMO can include reduced traffic congestion, reduced fuel consumption and reduced emissions.

Conclusion

As West Virginia strives to support quality of life and economic growth, it is critical that the state can provide a well-maintained, safe, and efficient 21st-century network of roads, highways, bridges, and transit to accommodate the mobility demands of modern society.

The combination of additional state and federal transportation funding has allowed West Virginia to move forward with numerous projects to improve the condition, use and efficiency of the surface transportation network. While this has allowed the state to undertake dozens of needed transportation projects, West Virginia still faces a funding shortfall to make additional repairs and improvements to its roads and bridges.

A safe and reliable transportation system that is maintained in good condition and offers improved mobility and accessibility to meet the needs of West Virginia residents, businesses, and tourists alike, is critical to keeping West Virginia mobile and moving the state forward.

# # #

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