

Keeping Oklahoma Moving Forward:

Providing a World Class Transportation System
in the Sooner State



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

Accessibility, connectivity and mobility are critical factors in a state's quality of life and economic competitiveness. The growth and development of a state or region, and the quality of life of its residents, hinge on efficient and safe access to employment, customers, commerce, recreation, education and healthcare via multiple transportation modes. The quality of life of Oklahoma's residents and the pace of the state's economic growth is 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 the system of roads, highways and bridges that can support commerce within Oklahoma and connect the state to markets throughout the country and around the globe, while providing the safe, smooth and efficient mobility that residents require. The Oklahoma Department of Transportation (ODOT) has made significant strides in recent years in improving road and bridge conditions, making needed safety improvements to decrease the number of fatalities on the state's roads, and increasing the efficiency of the transportation system to ease congestion and bottlenecks. In order to continue to make needed improvements to Oklahoma's transportation system, adequate and reliable funding must be made available at the local, state and federal levels.

TRIP's "Keeping Oklahoma Moving Forward" report examines the condition, use, safety and efficiency of Oklahoma's surface transportation system; improvements made to the state's transportation system in recent years; and the importance of reauthorization of the federal surface transportation program. Sources of information for this report include the Oklahoma Department of Transportation (ODOT), 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).

OKLAHOMA'S TRANSPORTATION SYSTEM AND FUNDING

While ODOT has been able to make significant improvements to state-maintained roads and bridges, additional progress may be stalled due to a lack of reliable funding. ODOT's current [Eight-Year Construction Work Plan](#) includes a variety of projects that address multiple needs across the state, including addressing 804 miles of two-lane highways with deficient shoulders, completing interchanges at I-235/I-44 and I-35/I-240 in Oklahoma City, continuing improvements at I-44/US-75 in Tulsa, expanding the I-40 corridor between Oklahoma City and Shawnee, improving pavement conditions and traffic operations on the US-69 and I-35 corridors and continuing to address bridge improvements throughout the state.

Despite these improvements, the current needs statewide have outpaced available funding. ODOT is currently able to address only 15 percent of needed pavement improvements in the current Eight-Year Construction Work Plan, which does not reflect additional deterioration over time that will require more investment in the future to keep from falling farther behind. And, according to ODOT, more than 50 percent of the 9,500 miles of two-lane highways in the state lack sufficient shoulders. And, while the current Eight-Year Construction Plan will address roughly 804 miles, more than 4,000 miles of two-lane highways lack the funds needed for improvement.

The ability of revenue from Oklahoma's motor fuel tax – a critical source of state transportation funds – to keep pace with the state's future transportation needs is likely to continue to erode as a result of increasing vehicle fuel efficiency and the increasing popularity of electric vehicles.

The current federal transportation legislation, [Fixing America’s Surface Transportation Act \(FAST Act\)](#), was set to expire on September 30, 2020. Congress extended it by one year to September 30, 2021. The FAST Act is a major source of federal funding for road, highway and bridge repairs in Oklahoma. Throughout the FAST-Act – fiscal years 2016 to 2021 – the program provided \$4.1 billion to Oklahoma for road and bridge improvements, an average of \$676 million per year. From 2014 to 2018, the federal government provided \$1.09 for road improvements in Oklahoma for every \$1.00 state motorists paid in federal highway user fees, including the federal state motor fuel tax.

ROAD CONDITIONS IN OKLAHOMA

ODOT has made significant progress in recent years in improving the condition of state-maintained roads, which includes non-tolled interstates, U.S. highways and state highways. The chart below details the share of pavements in good, fair or poor condition on Oklahoma’s Interstate, non-Interstate National Highway System (NHS) and State Highway System roads.

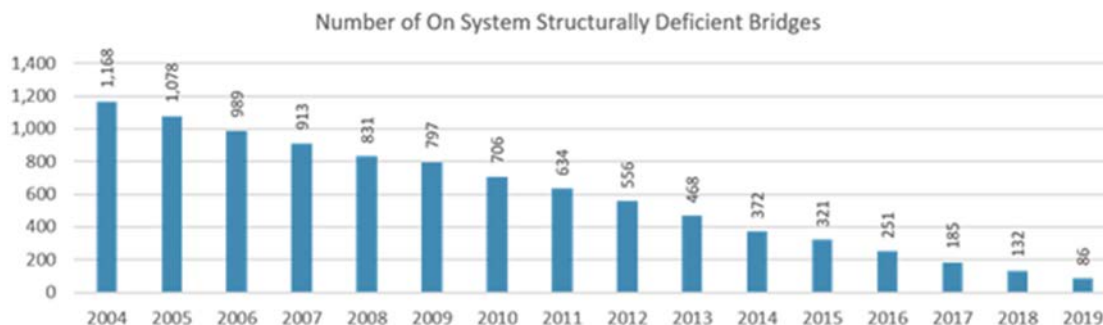
	Good	Fair	Poor
Interstate	61%	38%	1%
Non-Interstate NHS	39%	58%	4%
State Highway System	35%	60%	5%

ODOT expects to address 3,216 lane miles of pavement in poor or fair condition from 2021-2028, during the Eight-Year Construction Work Plan. The 2021-2024 Asset Preservation Plan will also address 2,540 miles of roadway that are in poor or fair condition. The pavement improvement projects planned by ODOT through 2028 will only allow the agency to address approximately 15 percent of the pavement needs during this period, an estimate which also doesn’t take into account the amount of additional deterioration that is expected to occur during this period, further increasing future roadway preservation needs.

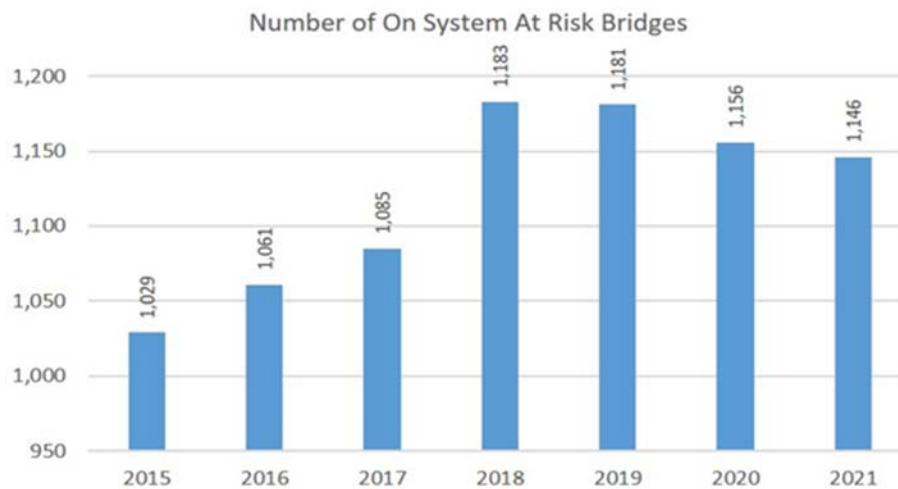
Driving on rough roads costs motorists additional vehicle operating costs (VOC) including accelerated vehicle depreciation, additional vehicle repair costs, increased fuel consumption and increased tire wear. TRIP estimates that additional VOC borne by Oklahoma motorists as a result of deteriorated road conditions is \$987 million annually, an average of \$394 per driver statewide.

BRIDGE CONDITIONS IN OKLAHOMA

ODOT has made strides in recent years in reducing the number of structurally deficient bridges on the state-maintained system; however, much work is still needed. Since 2004, when an all-time high of 1,168 state-maintained bridges were rated structurally deficient (of a total of approximately 6,800 bridges), ODOT has reduced the number of structurally deficient state-maintained bridges each year, dropping to just 86 structurally deficient state-maintained bridges in at the end of 2019.



While 86 state-maintained bridges are currently rated structurally deficient at the end of 2019, an additional 1,181 state-maintained bridges are deemed at risk of becoming structurally deficient in the coming years and will require additional maintenance, improvements and funding to keep them from becoming structurally deficient.



Within the 2021-2028 Eight-Year Construction Work Plan, ODOT expects to address a total of 609 state-maintained bridges, in addition to addressing 152 bridges in the 2021-2024 Asset Preservation Plan. Of these bridges, 44 are currently rated structurally deficient and 376 are at risk of becoming structurally deficient.

TRAFFIC SAFETY IN OKLAHOMA

From 2015 to 2019, 3,276 people were killed in traffic crashes in Oklahoma. The state's 2019 traffic fatality rate of 1.43 fatalities for every 100 million miles traveled is the sixth highest in the nation and higher than the national average of 1.11. The fatality rate on Oklahoma's non-interstate rural roads is more than double that on all other roads in the state (2.27 per 100 million vehicle miles of travel vs. 0.94). Improving safety on Oklahoma'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.

More than half – 56 percent -- of two-lane, state-maintained highways in Oklahoma have deficient shoulders (5,299 of 9,500 miles). In order to improve traffic safety and reduce the number of fatalities on the state's roads, ODOT's Eight-Year 2021-2028 Construction Work Plan includes the addition of 780 miles of paved shoulders on two-lane highways, improving 15 percent of the state-maintained, two-lane highways that currently have deficient shoulders. ODOT has installed nearly 716 miles of cable barrier and more than 250 miles of centerline rumble strips to improve roadway safety by reducing crossover and lane departure traffic fatalities. ODOT's eight-year 2021-2028 Construction Work Plan calls for the provision of an additional 820 miles of centerline rumble strips on two-lane rural highways across the state and includes pavement markings for improved visibility under wet and dark conditions. ODOT has also invested in pavement marking improvements on metro freeways and Interstates, which will improve visibility under wet or dark conditions, and has completed 21 projects – with 28 more to be completed by summer 2021 – to upgrade school zones with new signage and flashing beacons, primarily in smaller communities.

TRAFFIC CONGESTION IN OKLAHOMA

Congested roads and bottlenecks choke commuting and commerce and cost Oklahoma drivers \$1.5 billion each year in the form of lost time and wasted fuel. Due to the Covid-19 pandemic, vehicle travel in Oklahoma dropped by as much as 33 percent in April 2020 (as compared to vehicle travel during the same month the previous year) but rebounded to five percent above March 2019 levels by March 2021. The chart below details the annual hours lost to congestion and congestion costs per driver in the state’s largest urban areas.

Location	Hours Lost	Congestion Cost
Oklahoma City	50	\$842
Tulsa	46	\$732

The chart below lists the most congested segments of freeways in Oklahoma during morning and evening peak travel times.

Rank	AM Peak		PM Peak	
	Area	Extents	Area	Extents
1	Oklahoma City Metro	I-44 EB from SH-152 to I-40	Oklahoma City Metro	I-235 NB from NE 23rd St. to I-44
2	Oklahoma City Metro	I-35 NB from I-240 to I-40	Oklahoma City Metro	I-235 SB from NE 23rd to I-40
3	Oklahoma City Metro	I-35 NB from SW 19th St. to I-240	Oklahoma City Metro	I-40 WB from Pennsylvania Ave. to I-44
1	Tulsa Metro	I-44 EB from I-244 to US-75	Tulsa Metro	I-44 EB from US-169 to S 165th E Ave.
2	Tulsa Metro	US-64 WB from I-44 to I-444	Tulsa Metro	US-64 EB from I-44 to I-444
3	Tulsa Metro	US-75 SB from I-244 to I-44	Tulsa Metro	US-75 SB from I-244 to I-44

FREIGHT TRANSPORTATION AND THE IMPACT OF TRANSPORTATION INVESTMENT ON ECONOMIC GROWTH IN OKLAHOMA

The health and future growth of Oklahoma’s economy is riding on its surface transportation system. Oklahoma’s agricultural sector and energy industry rely heavily on the state’s transportation network to ship crops and livestock, as well as oil, gas and wind energy products to market. Each year, \$294 billion in goods are shipped to and from sites in Oklahoma.

The amount of freight transported in Oklahoma 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. The value of freight shipped to and from sites in Oklahoma, in inflation-adjusted dollars, is expected to increase 61 percent by 2045 and by 61 percent for goods shipped by trucks, placing an increased burden on the state’s network of roads and bridges.

According to a [report by the American Road & Transportation Builders Association](#), the design, construction and maintenance of transportation infrastructure in Oklahoma support approximately 51,000 full-time jobs across all sectors of the economy. These workers earn \$1.8 billion annually. Approximately 796,000 full-time jobs in Oklahoma 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 Oklahoma Department of Transportation (ODOT), the American Association of State Highway and Transportation Officials (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). All data used in the report are the most recent available. Cover photo credit: Mike Robinson.

Introduction

Oklahoma’s surface transportation system provides a vital link for the state’s residents, visitors and businesses, providing daily access to homes, jobs, shopping, natural resources and recreation. Supporting quality of life and a robust economy in Oklahoma requires that the state provide an efficient, safe and well-maintained transportation system that allows for a high level of accessibility, connectivity and safety. A safe, well-maintained and reliable network of roads and bridges is critical for the economic health of the state and the nation.

Continuing efforts to improve Oklahoma’s transportation network will be critical to help enhance economic development opportunities, improve business productivity, and make it easier and more reliable for the public to get to and from destinations including work, home, school, shopping and social events.

Population, Travel and Economic Trends in Oklahoma

Oklahoma residents and businesses require a high level of personal and commercial mobility. Population increases and economic growth in the state have resulted in an increase in vehicle miles of travel (VMT) and an increased demand for mobility and connectivity. To foster quality of life and spur continued economic growth it will be critical that Oklahoma provide an efficient, safe and modern transportation system that can accommodate future growth in population, tourism, business, recreation and vehicle travel.

Oklahoma’s population has grown steadily, reaching approximately four million residents in 2019, a 15 percent increase since 2000.¹ Oklahoma had approximately 2.5 million licensed drivers in 2019.²

From 2000 to 2019, Oklahoma’s gross domestic product (GDP), a measure of the state’s economic output, increased by 62 percent when adjusted for inflation – the sixth highest rate in the nation.³ U.S. GDP, adjusted for inflation, increased 45 percent during this period.⁴

Due to the Covid-19 pandemic, vehicle travel in Oklahoma dropped by as much as 33 percent in April 2020 (as compared to vehicle travel during the same month the previous year).⁵ But by March 2021, vehicle travel in Oklahoma had surpassed pre-pandemic levels and was five percent higher than in March 2019.⁶

Road Conditions in Oklahoma

The life cycle of Oklahoma’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.

ODOT maintains 32,751 miles of highway in the state, the 17th largest highway system in the nation. However, Oklahoma’s population and tax base, which supports needed infrastructure improvements, is the 29th largest in the nation.

The chart below details the share of pavements in good, fair or poor condition on Oklahoma’s Interstate, non-Interstate National Highway System (NHS) and State Highway System roads.

Chart 1. Oklahoma pavement conditions on Interstate, non-Interstate NHS and State Highway System roads.

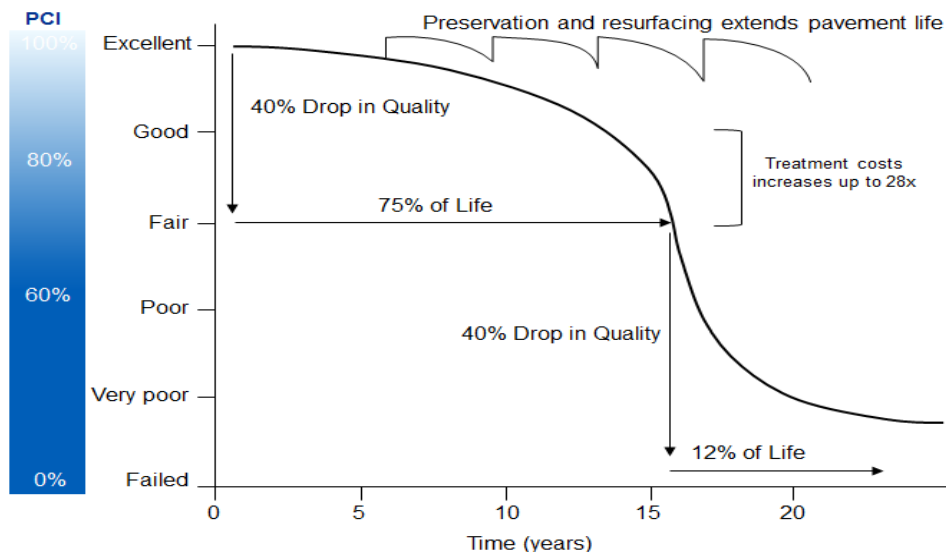
	Good	Fair	Poor
Interstate	61%	38%	1%
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State Highway System	35%	60%	5%

Source: Oklahoma Department of Transportation response to TRIP survey.

ODOT expects to address 3,216 lane miles of pavement in poor or fair condition from 2021-2028, during its Eight-Year Construction Work Plan.⁷ The 2021-2024 Asset Preservation Plan will also address 2,540 miles of roadway.⁸ The pavement improvement projects planned by ODOT through 2028 will only allow the agency address approximately 15 percent of the pavement needs during this period, an estimate which also doesn't take into account the amount of additional deterioration that is expected to occur during this period further increasing future roadway preservation needs.⁹

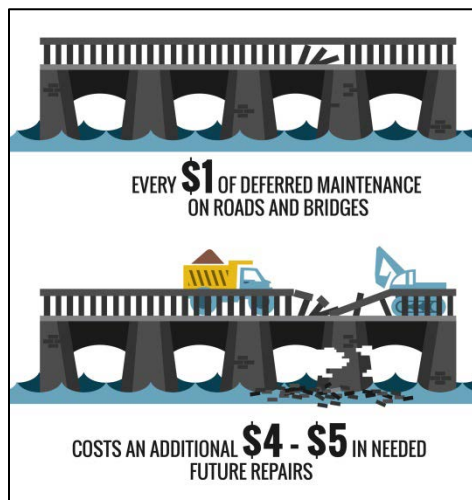
Pavement failure is caused by a combination of traffic, moisture and climate. Moisture often works its way into road surfaces and the materials that form the road's foundation, so Oklahomans can expect accelerated pavement deterioration due to the recent harsh winter. Road surfaces at intersections are 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.¹⁰ 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.¹¹



The Cost to Motorists of Rough Roads in Oklahoma

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 Oklahoma motorists as a result of deteriorated road conditions is \$987 million annually, an average of \$394 per driver statewide.¹²

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.¹³ 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 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.¹⁴ 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 Oklahoma

Oklahoma’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.

ODOT has made significant strides in recent years in reducing the number of structurally deficient bridges on the state-maintained system. A bridge is deemed 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.

Since 2004, when 1,168 state-maintained bridges were rated structurally deficient (of a total of approximately 6,800 bridges), ODOT has reduced the number of structurally deficient state-maintained bridges each year, dropping to just 86 structurally deficient state-maintained bridges at the end of 2019.¹⁵ The number of structurally deficient state-maintained bridges each year from 2004 to 2019 is detailed in the chart below.

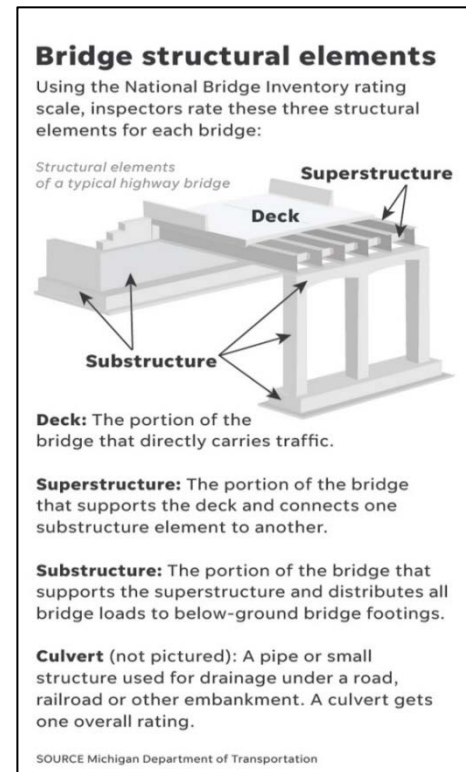
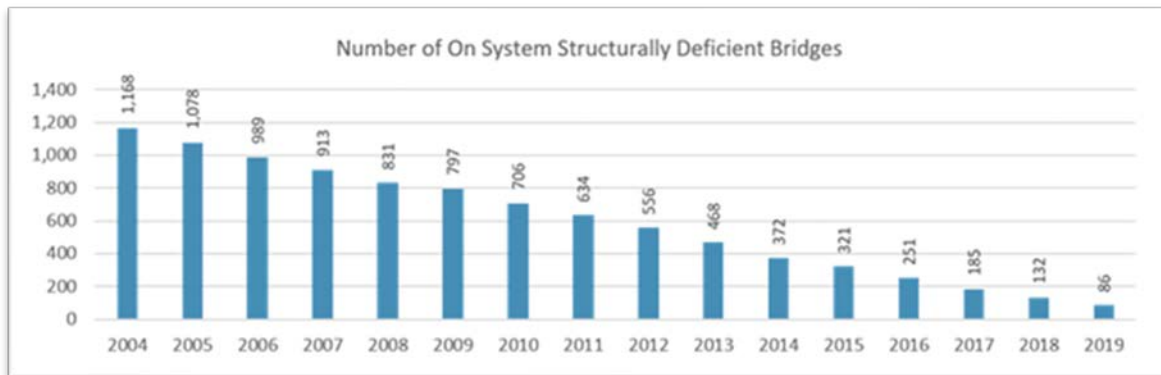


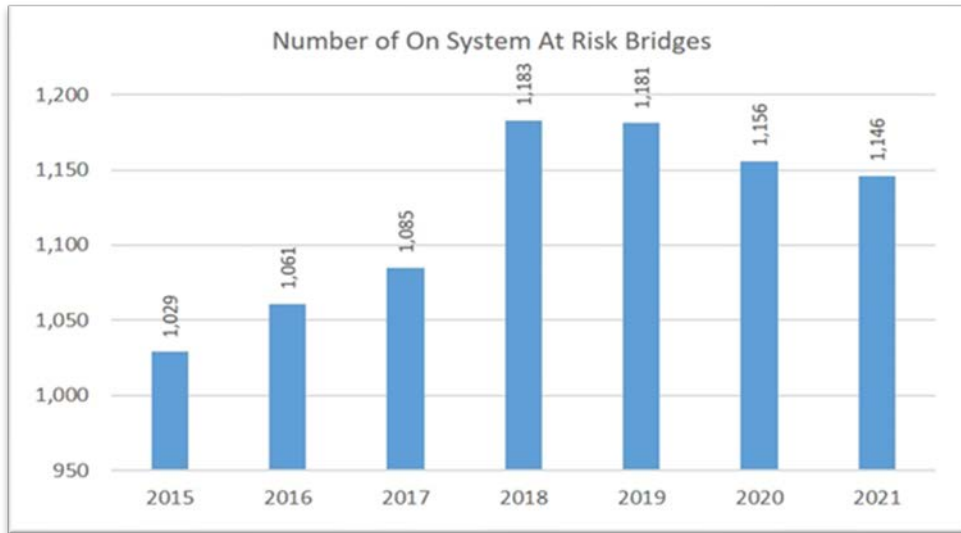
Chart 3. Number of state-maintained structurally deficient bridges, 2004-2019.



Source: ODOT response to TRIP survey.

In order to reach and maintain a goal of less than one percent of state-maintained bridges being structurally deficient, ODOT closely tracks bridges that are deemed at-risk of becoming structurally deficient. While 86 state-maintained bridges are currently rated structurally deficient, an additional 1,181 state-maintained bridges are deemed at risk of becoming structurally deficient.¹⁶ The chart below details the number of state-maintained bridges that are at risk of becoming structurally deficient.

Chart 4. State-maintained bridges at risk of becoming structurally deficient, 2015-2021.



Source: ODOT response to TRIP survey.

Within the 2021-2028 Eight-Year Construction Work Plan, ODOT expects to address a total of 609 state-maintained bridges, in addition to addressing 190 bridges in the 2021-2024 Asset Preservation Plan.¹⁷ Of these bridges, 26 are currently rated structurally deficient and 378 are at risk of becoming structurally deficient.¹⁸

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 Oklahoma, 47 percent of the state’s bridges were built in 1969 or earlier.¹⁹ 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 Oklahoma

A total of 3,276 people were killed in Oklahoma traffic crashes from 2015 to 2019, an average of 655 fatalities per year.

Chart 5. Oklahoma statewide traffic fatalities 2015 – 2019.

Year	Fatalities
2015	643
2016	683
2017	655
2018	655
2019	640
TOTAL	3,276
AVERAGE	655

Source: National Highway Traffic Safety Administration.

Oklahoma's overall traffic fatality rate of 1.43 fatalities per 100 million vehicle miles of travel in 2019 is higher than the national average of 1.11 and the sixth highest rate in the nation.²⁰ The fatality rate on Oklahoma's non-interstate rural roads is more than double that on all other roads in the state (2.27 fatalities per 100 million vehicle miles of travel vs. 0.94).²¹

More than half – 56 percent -- of two-lane, state-maintained highways in Oklahoma have deficient shoulders (5,299 of 9,500 miles).²² In order to improve traffic safety and reduce the number of fatalities on the state's roads, ODOT's eight-year 2021-2028 construction work plan includes the addition of 780 miles of paved shoulders on two-lane highways, improving 15 percent of the state-maintained, two-lane highways that currently have deficient shoulders.²³ ODOT has installed nearly 716 miles of cable barrier and more than 250 miles of centerline rumble strips to improve roadway safety by reducing crossover and lane departure traffic fatalities.²⁴ ODOT is currently installing an additional 820 miles of centerline rumble strips on two-lane rural highways across the state, and includes pavement markings for improved visibility under wet and dark conditions in 2021.²⁵

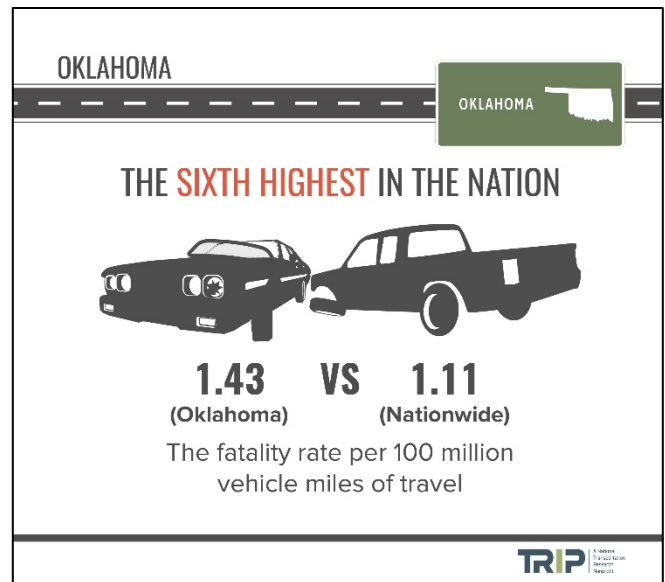
ODOT has completed 47 projects – with eight more to be completed by summer 2021 – to upgrade school zones with new signage and flashing beacons, primarily in smaller communities.

ODOT identified alcohol, distracted and lack of seatbelts as top three causes of fatalities. Roadway features that impact safety include rumble strips, cable barrier, paved shoulders and intersection modifications.

Traffic crashes in Oklahoma imposed a total of \$3.3 billion in economic costs in 2019.²⁶ 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.²⁷

Improving safety on Oklahoma'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 and intersection modifications, including construction of roundabouts, J-Turn intersections, RCUT intersections and innovative interchange designs.

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 Oklahoma

While traffic congestion is largely constrained to the state's urban areas, increasing congestion on Oklahoma's major urban 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.

The chart below lists the most congested segments of freeways in Oklahoma during morning and evening peak travel times.

Chart 6. Oklahoma’s most congested segments of roadway during morning and evening peak travel times.

Rank	AM Peak		PM Peak	
	Area	Extents	Area	Extents
1	Oklahoma City Metro	I-44 EB from SH-152 to I-40	Oklahoma City Metro	I-235 NB from NE 23rd St. to I-44
2	Oklahoma City Metro	I-35 NB from I-240 to I-40	Oklahoma City Metro	I-235 SB from NE 23rd to I-40
3	Oklahoma City Metro	I-35 NB from SW 19th St. to I-240	Oklahoma City Metro	I-40 WB from Pennsylvania Ave. to I-44
1	Tulsa Metro	I-44 EB from I-244 to US-75	Tulsa Metro	I-44 EB from US-169 to S 165th E Ave.
2	Tulsa Metro	US-64 WB from I-44 to I-444	Tulsa Metro	US-64 EB from I-44 to I-444
3	Tulsa Metro	US-75 SB from I-244 to I-44	Tulsa Metro	US-75 SB from I-244 to I-44

Source: Oklahoma Department of Transportation.

A 2019 [report](#) on urban mobility by the [Texas Transportation Institute](#) analyzes urban traffic congestion levels and provides estimates on the amount of time and the value of lost time and wasted fuel as a result of traffic congestion in 2017 for the average driver in the state’s largest metropolitan areas. The below chart shows the average number of hours lost annually for each driver in the state’s two 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	Congestion Cost
Oklahoma City	50	\$842
Tulsa	46	\$732

Source: Texas Transportation Institute.

Based on the TTI report, TRIP estimates that the total cost of traffic congestion in Oklahoma in terms of lost time and wasted fuel is \$1.5 billion annually.²⁸

Freight Transportation and the Impact of Transportation Investment in Oklahoma

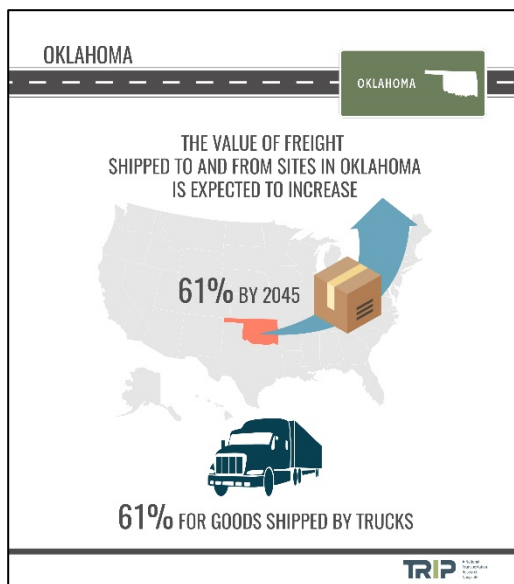
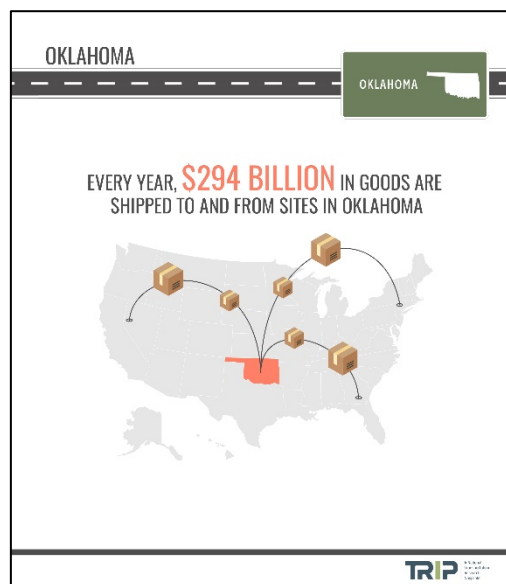
Today’s culture of business demands that an area have well-maintained and efficient roads, highways and bridges if it is to remain economically competitive. Global communications and the impact of free trade in North America and elsewhere have resulted in a significant increase in freight movement, making 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 Oklahoma. 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 Oklahoma 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.

Every year, \$294 billion in goods are shipped to and from sites in Oklahoma, 72 percent by truck.²⁹ The value of freight shipped to and from sites in Oklahoma, in inflation-adjusted dollars, is expected to increase 61 percent by 2045 and by 61 percent for goods shipped by trucks.³⁰



The ability of Oklahoma 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.

Investments in transportation improvements in Oklahoma 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 51,000 full-time jobs across all sectors of the state economy, earning these workers approximately \$1.8 billion annually.³¹ These jobs include approximately 25,000 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 25,000 full-time jobs in Oklahoma.³² Transportation construction in Oklahoma contributes an estimated \$323 million annually in state and local income, corporate and unemployment insurance taxes and the federal payroll tax.³³

Approximately 796,000 full-time jobs in Oklahoma 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 \$33 billion in wages and contribute an estimated

\$6 billion in state and local income, corporate and unemployment insurance taxes and the federal payroll tax.³⁴

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 one site selection factor in a 2020 [survey](#) of corporate executives by Area Development Magazine.³⁵

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.³⁶

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.³⁷ The benefits of TSMO can include reduced traffic congestion, reduced fuel consumption and reduced emissions.

Transportation Funding in Oklahoma

Investment in Oklahoma'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. While ODOT has been able to make significant improvements in recent years in the condition, safety and efficiency of its transportation system, additional funding will be needed to continue to make needed improvements.

ODOT's current Eight-Year Construction Work Plan includes a variety of projects that address multiple needs across the state, including completing interchanges at I-235/I-44 and I-35/I-240 in Oklahoma City, continuing improvements at I-44/US-75 in Tulsa, expanding the I-40 corridor between Oklahoma City and Shawnee, improving pavement conditions and traffic operations on the and I-35 and US-69 corridors, and continuing to address bridge improvements throughout the state.³⁸

Despite these improvements, the current needs statewide have outpaced available funding. ODOT is currently able to address only 15 percent of needed pavement improvements in the current Eight-Year Construction Work Plan, which does not reflect additional deterioration over time that will require more investment in the future to keep from falling farther behind.³⁹ And according to ODOT, more than 50

percent of the 9,500 miles of two-lane highways in the state lack sufficient shoulders.⁴⁰ And while the current Eight-Year Construction Plan will address roughly 780 miles, more than 4,000 miles of two-lane highways lack the funds needed for improvement.⁴¹

Revenue from Oklahoma's motor fuel tax – a critical source of state transportation funding -- is likely to erode as a result of increasing vehicle fuel efficiency and the increasing use of electric vehicles. 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.⁴² The share of electric vehicles of total passenger vehicle sales in the U.S. is expected to increase to five percent by 2023 and 60 percent by 2040, by which time electric vehicles will represent approximately 30 percent of the passenger vehicle fleet.⁴³

Most federal funds for highway and transit improvements in Oklahoma 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).

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.⁴⁴

Signed into law in December 2015, the five-year [Fixing America's Surface Transportation Act \(FAST Act\)](#) was scheduled to expire on September 30, 2020. Congress extended the legislation for one year to September 30, 2021. The FAST Act provides modest increases in federal highway and transit spending. The 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 FAST-Act is a major source of funding for road, highway and bridge repairs in Oklahoma. Throughout the six years of the FAST-Act – fiscal years 2016 to 2021 – the program provided \$4.1 billion to Oklahoma for road repairs and improvements, an average of \$676 million per year.⁴⁵ From 2014 to 2018, the federal government provided \$1.09 for road improvements in Oklahoma for every \$1.00 state motorists paid in federal highway user fees, including the federal state motor fuel tax.⁴⁶

Federal funds are a critical source of highway investment in Oklahoma and represent a significant share of funds used by the state for major road, highway and bridge repairs and improvements. From 2014 to 2018, federal funds provided for highway improvements were the equivalent of 44 percent of the amount of Oklahoma state capital outlays on road, highway and bridge projects, including construction, engineering and right-of-way acquisition.⁴⁷

Oklahoma federal-aid eligible roads, bridges and highways include the most critical routes in the state, including the Interstate Highway System, major highways and important rural and urban routes. Federal-aid eligible roadways in Oklahoma account for 31 percent of state lane-miles and carry 89 percent of all vehicle miles of travel in the state.⁴⁸ Fifty-six percent of Oklahoma's bridges by count, and 82 percent of bridges measured by deck area are eligible for Federal aid.⁴⁹

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.⁵⁰ This backlog includes \$435 billion for highway rehabilitation; \$125 billion for bridge rehabilitation; \$120 billion for system expansion and \$106 billion for system enhancement.⁵¹ 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.⁵²

Conclusion

As Oklahoma strives to continue and expand its economic growth and enhance quality of life for its residents, it will be critical that the state is able to provide a well-maintained, safe and efficient 21st century network of roads, highways, bridges and transit that can accommodate the mobility demands of a modern society. It is critical that Oklahoma continues to make progress towards improving the condition, safety and efficiency of the state's transportation system, and that adequate funding is available to reach those goals of improving safety, mobility and accessibility, which is vital to the state's residents, businesses and visitors.

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ENDNOTES

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- ⁶ *Ibid.*
- ⁷ ODOT response to TRIP survey.
- ⁸ *Ibid.*
- ⁹ *Ibid.*
- ¹⁰ Selecting a Preventative Maintenance Treatment for Flexible Pavements. R. Hicks, J. Moulthrop. Transportation Research Board. 1999. Figure 1.
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- ¹² TRIP calculation.
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- ²⁴ *Ibid.*
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- ²⁶ TRIP estimate based on NHTSA report “The Economic and Societal Impact of Motor Vehicle Crashes, 2010 (Revised), 2016. P. 146.
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<https://www.fhwa.dot.gov/bridge/fc.cfm> All bridges excluding bridges classified as local or rural collector are eligible for federal aid.

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⁵¹ ibid.

⁵² ibid.



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