

Keeping North Dakota Moving Forward:

Progress and Challenges in Providing a Modern Surface Transportation System



TRIP

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Founded in 1971, [TRIP](http://tripnet.org)® 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 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 of North Dakota'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 North Dakota and connect the state to markets around the globe, while providing the safe, smooth and efficient mobility that residents require. The increased transportation funding provided to local governments by the state legislature's passage of [HB 1066 "Operation Prairie Dog"](#) in 2019 has started to provide some assistance to local governments in addressing their transportation needs. But, at its current level of transportation investment, North Dakota will be challenged to maintain and improve current road and bridge conditions, safety and reliability.

TRIP's "Keeping North Dakota Moving Forward" report examines the condition, use, safety and efficiency of North Dakota's surface transportation system; the impact of the 2019 boost in state transportation investment; and, the importance of reauthorization of the federal surface transportation program. Sources of information for this report include the North Dakota Department of Transportation (NDDOT), 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).

NORTH DAKOTA'S TRANSPORTATION SYSTEM AND FUNDING

To address a lack of adequate infrastructure funding for local governments, in 2019, the North Dakota state legislature passed [House Bill 1066](#), dubbed Operation Prairie Dog, which implemented changes to oil and gas production taxes and allocated up to \$125 million per year to city, county and township infrastructure investment. By November 2020, approximately \$44 million has been distributed to local governments for infrastructure investment.

The ability of revenue from North Dakota's motor fuel tax – a critical source of state transportation funds – to keep pace with the state's future transportation needs 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. The share of electric vehicles of total passenger vehicle sales in the U.S. is expected to increase to five percent by 2023 and to 60 percent by 2040, by which time electric vehicles will represent approximately 30 percent of the passenger vehicle fleet.

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 funding for road, highway and bridge repairs in North Dakota. Throughout the FAST-Act – fiscal years 2016 to 2021 – the program provided \$1.6 billion to North Dakota for road repairs and improvements, an average of \$264 million per year. From 2014 to 2018, the federal government provided \$1.29 for road improvements in North Dakota for every \$1.00 state motorists paid in federal highway user fees, including the federal state motor fuel tax.

From 2014 to 2018, federal funds provided for highway improvements were the equivalent of 45 percent of the amount of North Dakota state capital outlays on road, highway and bridge projects, including construction, engineering and right-of-way acquisition.

ROAD CONDITIONS IN NORTH DAKOTA

Forty-four percent of North Dakota's major locally and state-maintained urban roads are in poor condition, 33 percent are in fair condition, and the remaining 23 percent are in good condition. Three percent of North Dakota's major locally and state-maintained rural roads are in poor condition, 25 percent are in fair condition, and the remaining 72 percent are in good condition.

Driving on rough roads costs North Dakota's drivers an average of \$410 each annually, a total of \$230 million statewide. The chart below details pavement conditions on major urban roads in the state's largest urban areas and the average annual additional Vehicle Operating Costs (VOC) per regional driver as a result of driving on rough roads.

Location	Poor	Fair	Good	VOC
Bismarck	34%	40%	26%	\$764
Fargo	26%	39%	35%	\$630

BRIDGE CONDITIONS IN NORTH DAKOTA

Ten percent of North Dakota's bridges are rated in poor/structurally deficient condition. Bridges that are rated poor/structurally deficient have significant deterioration of the bridge deck, supports or other major components. Thirty-six percent of the state's bridges are rated in fair condition and the remaining 54 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 North Dakota, 46 percent of the state's bridges were built in 1969 or earlier. The chart below details bridge conditions statewide and in the state's largest urban areas.

	POOR/STRUCTURALLY DEFICIENT		FAIR		GOOD		TOTAL BRIDGES
	Number	Share	Number	Share	Number	Share	
Bismarck	20	5%	132	32%	267	64%	419
Fargo	62	6%	463	41%	580	51%	1127
North Dakota	444	10%	1,534	36%	2,334	54%	4,312

TRAFFIC SAFETY IN NORTH DAKOTA

From 2015 to 2019, 564 people were killed in traffic crashes in North Dakota. The state's 2019 traffic fatality rate of 1.02 fatalities for every 100 million miles traveled is below the national average of 1.11. The fatality rate on North Dakota's non-interstate rural roads is approximately triple that of all other roads in the state (1.49 per 100 million vehicle miles of travel vs. 0.48). Improving safety on North Dakota'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.

Traffic crashes in North Dakota imposed a total of \$788 million in economic costs in 2019.



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Year	Statewide Fatalities
2015	131
2016	113
2017	115
2018	105
2019	100
TOTAL	564
AVERAGE	113

TRAFFIC CONGESTION IN NORTH DAKOTA

Congested roads and bottlenecks choke commuting and commerce and cost North Dakota drivers \$140 million each year in the form of lost time and wasted fuel. Due to the Covid-19 pandemic, vehicle travel in North Dakota dropped by as much as 32 percent in April 2020 (as compared to vehicle travel during the same month the previous year) but rebounded to seven percent below the previous year's volume in January 2021. The chart below details the annual hours lost to congestion and congestion costs per driver in the state's largest urban areas.

Urban Area	Hours Lost	Congestion Cost
Bismarck	17	\$331
Fargo	17	\$321

While traffic congestion is largely constrained to the state's urban areas, seasonal load restrictions on some highways due to a lack of adequate load carrying capacity can also increase congestion by requiring trucks to reduce their weight and make additional trips, which results in additional truck traffic. Traffic congestion 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 locations on North Dakota highways.

County	Urban Area	Congested Locations
Burleigh	Bismarck	I-94 Exit 159 (State Street/US 83)
Grand Forks	Grand Forks	I-29 47th Avenue (Future Interchange)
Morton	Mandan	I-94 Exit 152 (Sunset Drive)
Stark	Dickinson	I-94 Exit 61 (ND 22)
Burleigh/Morton	Bismarck/Mandan	I-94 Grant Marsh Bridge
Morton	Mandan	I-94 Midway
Burleigh	Bismarck	I-94 Exit 161 (I-94 East Business Loop)
Cass	Fargo	I-29 (64th Avenue South Structure)
Stutsman	Jamestown	I-94 Exit 257 (Jamestown Separation)
Burleigh	Bismarck	State St (Calgary to 57th Ave N)
Burleigh	Bismarck	Expressway (River to Railroad Overpass)
Burleigh	Bismarck	US 83 & 71st Ave
Stark	Dickinson	ND 22 RR Underpass
Cass	Fargo	Main Ave (University to 25th St)
Cass	Fargo	19th Ave N (I-29 to University)
Grand Forks	Grand Forks	DeMers Ave & 42nd St
Grand Forks	Grand Forks	32nd Ave S (I-29 to Washington St)
Grand Forks	Grand Forks	Washington St & Gateway Dr
Grand Forks	Grand Forks	Washington St & DeMers Ave
Morton	Mandan	Memorial Highway
Ward	Minot	S Broadway (19th Ave SW to south city limits)
Williams	Williston	US 2 and 26th Street Intersection
Burleigh	Bismarck	43rd Ave (State St to 26th St)
Burleigh/Morton	Bismarck/Mandan	Beltway
Burleigh/Morton	Bismarck/Mandan	Northern Bridge
Grand Forks	Grand Forks	42nd St/Alerus
Stutsman	Jamestown	4th Ave RR Underpass
Cass	West Fargo	Sheyenne (40th Ave S to 52nd Ave S)

FREIGHT TRANSPORTATION AND THE IMPACT OF TRANSPORTATION INVESTMENT ON ECONOMIC GROWTH IN NORTH DAKOTA

The health and future growth of North Dakota's economy is riding on its surface transportation system. North Dakota's agricultural sector relies heavily on the state's transportation network to ship crops and livestock to market. Each year, \$199 billion in goods are shipped to and from sites in North Dakota. Twenty percent of all travel on North Dakota interstate highways is by large combination trucks.

The amount of freight transported in North Dakota 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 North Dakota, in inflation-adjusted dollars, is expected to increase 58 percent by 2045 and by 128 percent for goods shipped by trucks, placing an increased burden on the state's network of roads and bridges.

Accommodating the significant increase expected in the movement of freight by trucks in North Dakota will be further challenged by the significant number of freight routes in North Dakota that are constrained because the roads have inadequate load carrying capacity to accommodate large trucks.

According to a [report by the American Road & Transportation Builders Association](#), the design, construction and maintenance of transportation infrastructure in North Dakota support approximately 13,258 full-time jobs across all sectors of the economy. These workers earn \$667 million annually. Approximately 215,000 full-time jobs in North Dakota 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 North Dakota Department of Transportation (NDDOT), 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.

Introduction

North Dakota'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 North Dakota requires that the state provide an efficient, safe and well-maintained transportation system that allows for a high level of accessibility, connectivity and safety.

As a state with an agricultural sector heavily reliant on moving goods to markets around the globe, and as an important through-point for goods and people as they travel across the country, North Dakota's transportation system plays a vitally important role. North Dakota's urban areas rely on a diverse economy including finance, real estate, retail, government services, manufacturing and education, while the economy of the state's rural areas relies on agriculture, forestry, fishing and hunting. A safe, well-maintained and reliable network of roads and bridges is critical for each of these sectors and for the economic health of the state and the nation.

Investing adequately in North Dakota's transportation network will 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 North Dakota

North Dakota 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 North Dakota provide an efficient, safe and modern transportation system that can accommodate future growth in population, tourism, business, recreation and vehicle travel.

North Dakota's population has grown steadily, reaching approximately 762,000 residents in 2019, a 19 percent increase since 2000.¹ North Dakota had approximately 556,000 licensed drivers in 2019.²

From 2000 to 2019, North Dakota's gross domestic product (GDP), a measure of the state's economic output, more than doubled, increasing by 120 percent when adjusted for inflation - the fastest rate of growth in the nation.³ U.S. GDP, adjusted for inflation, increased 45 percent during this period.⁴

From 2000 to 2019, annual VMT in North Dakota increased by 36 percent, from approximately 7.2 billion miles traveled annually to approximately 9.8 billion miles traveled annually.⁵ Due to the Covid-19 pandemic, vehicle travel in North Dakota dropped by as much as 32 percent in April 2020 (as compared to vehicle travel during the same month the previous year) but rebounded to seven percent below the previous year's volume in January 2021.⁶

Road Conditions in North Dakota

The life cycle of North Dakota'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 NDDOT 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.

Three percent of North Dakota's major locally and state-maintained rural roads and highways have pavements rated in poor condition, 25 percent are fair condition and the remaining 72 percent are rated in good condition.⁷

Forty-four percent of North Dakota's major locally and state-maintained urban roads and highways have pavements rated in poor condition, 33 percent are rated in fair condition, and the remaining 23 percent are rated in good condition.⁸ The chart below details pavement conditions on major roads in the state's largest urban areas and statewide.⁹

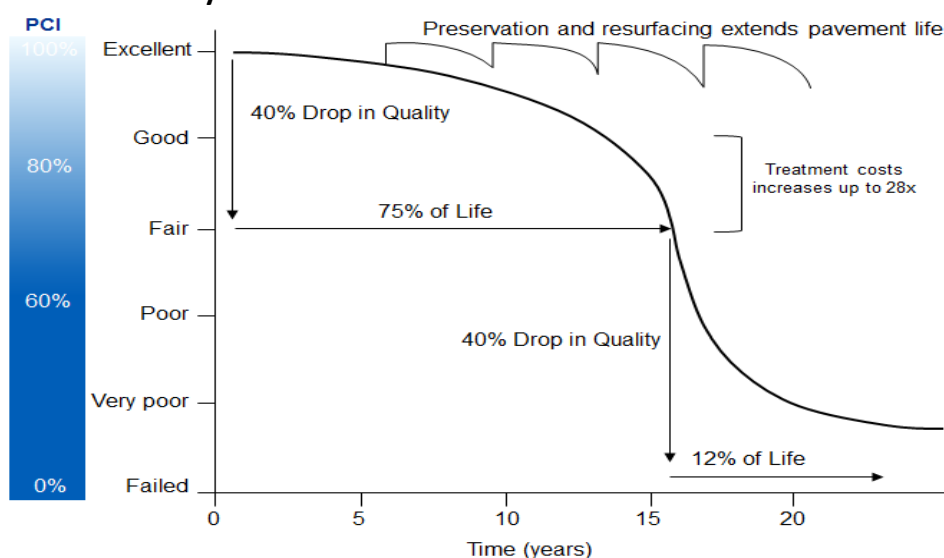
Chart 3. Pavement conditions on major roads in North Dakota's largest urban areas and statewide.

Location	Poor	Fair	Good
Bismarck	34%	40%	26%
Fargo	26%	39%	35%

Source: TRIP analysis of Federal Highway Administration data.

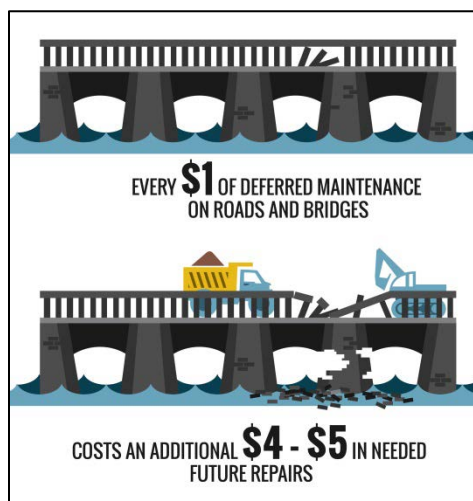
Pavement failure is caused by a combination of traffic, moisture and climate. Moisture often works its way into road surfaces and the materials that form the road's foundation. Road surfaces at intersections are more prone to deterioration because the slow-moving or standing loads occurring at these 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.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 5. 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 North Dakota

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 North Dakota motorists as a result of deteriorated road conditions is \$230 million annually, an average of \$410 per driver statewide.¹² The chart below shows additional VOC per motorist in the state's largest urban areas and statewide.

Chart 6. Vehicle operating costs per motorist as a result of driving on deteriorated roads.

Location	VOC
Bismarck	\$764
Fargo	\$630
North Dakota Statewide	\$230 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.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 North Dakota

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

Ten percent (444 of 4,312) of North Dakota's locally and state-maintained bridges are rated in poor/structurally deficient condition.¹⁵ 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. The rating does not indicate that the bridge is unsafe.

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. Thirty-six percent of North Dakota's locally and state-maintained bridges have been rated in fair condition.¹⁶ 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 54 percent of the state's bridges are rated in good condition.¹⁷

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

Chart 7. Bridge conditions statewide and in North Dakota's largest urban areas.

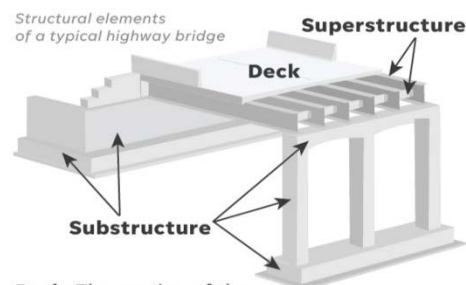
	POOR/STRUCTURALLY DEFICIENT		FAIR		GOOD		TOTAL BRIDGES
	Number	Share	Number	Share	Number	Share	
Bismarck	20	5%	132	32%	267	64%	419
Fargo	62	6%	463	41%	580	51%	1127
North Dakota	444	10%	1,534	36%	2,334	54%	4,312

Source: TRIP analysis of Federal Highway Administration National Bridge Inventory (2020).

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 North Dakota, 46 percent of the state's bridges were built in 1969 or earlier.¹⁸ 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.

Bridge structural elements

Using the National Bridge Inventory rating scale, inspectors rate these three structural elements for each bridge:



Deck: The portion of the bridge that directly carries traffic.

Superstructure: The portion of the bridge that supports the deck and connects one substructure element to another.

Substructure: The portion of the bridge that supports the superstructure and distributes all bridge loads to below-ground bridge footings.

Culvert (not pictured): A pipe or small structure used for drainage under a road, railroad or other embankment. A culvert gets one overall rating.

SOURCE Michigan Department of Transportation

Traffic Safety in North Dakota

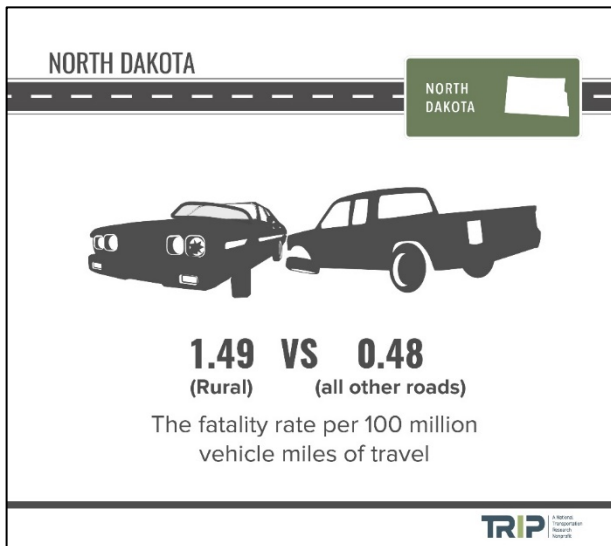
A total of 564 people were killed in North Dakota traffic crashes from 2015 to 2019, an average of 113 fatalities per year.

Chart 8. Regional and statewide traffic fatalities 2015 – 2019.

Year	Statewide Fatalities
2015	131
2016	113
2017	115
2018	105
2019	100
TOTAL	564
AVERAGE	113

Source: National Highway Traffic Safety Administration.

Three major factors are associated with fatal vehicle crashes: driver behavior, vehicle characteristics and roadway features. Roadway features that impact safety include the number of lanes, lane widths, lighting, lane markings, rumble strips, shoulders, guard rails, other shielding devices, median barriers and intersection design.



North Dakota's overall traffic fatality rate of 1.02 fatalities per 100 million vehicle miles of travel in 2019 is below the national average of 1.11.¹⁹ The fatality rate on North Dakota's non-interstate rural roads is approximately triple that of all other roads in the state (1.49 fatalities per 100 million vehicle miles of travel vs. 0.48).²⁰

Traffic crashes in North Dakota imposed a total of \$788 million in economic costs in 2019.²¹ 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.²²

Improving safety on North Dakota's roadways can be achieved through further improvements in vehicle safety;

improvements in driver, pedestrian, and bicyclist behavior; and, a variety of improvements in roadway safety features. The severity of serious traffic crashes could be reduced through roadway improvements, where appropriate, such as converting intersections to roundabouts; removing or shielding roadside objects; the addition of left-turn lanes at intersections; adding or improving median barriers; improved lighting; adding centerline or shoulder rumble strips; providing appropriate pedestrian and bicycle facilities; providing wider lanes, wider and paved shoulders; upgrading roads from two lanes to four lanes; providing better road and lane markings; and updating rail crossings.

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

Cost of Congestion in North Dakota

While traffic congestion is largely constrained to the state's urban areas, increasing congestion on North Dakota'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. Seasonal load restrictions on some highways due to a lack of adequate load carrying capacity can also increase congestion by requiring trucks to reduce their weight and make multiple trips, which results in additional truck traffic. Traffic congestion can also rob 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.

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 9. Annual hours lost to congestion and congestion costs per driver.

Urban Area	Hours Lost	Congestion Cost
Bismarck	17	\$331
Fargo	17	\$321

Source: Texas Transportation Institute.

Based on the TTI report, TRIP estimates that the total cost of traffic congestion in North Dakota in terms of lost time and wasted fuel is \$140 million annually.²³ The chart below lists the most congested locations on North Dakota highways.

Chart 10. North Dakota's Worst Traffic Bottlenecks.

County	Urban Area	Congested Locations
Burleigh	Bismarck	I-94 Exit 159 (State Street/US 83)
Grand Forks	Grand Forks	I-29 47th Avenue (Future Interchange)
Morton	Mandan	I-94 Exit 152 (Sunset Drive)
Stark	Dickinson	I-94 Exit 61 (ND 22)
Burleigh/Morton	Bismarck/Mandan	I-94 Grant Marsh Bridge
Morton	Mandan	I-94 Midway
Burleigh	Bismarck	I-94 Exit 161 (I-94 East Business Loop)
Cass	Fargo	I-29 (64th Avenue South Structure)
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Grand Forks	Grand Forks	32nd Ave S (I-29 to Washington St)
Grand Forks	Grand Forks	Washington St & Gateway Dr
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Morton	Mandan	Memorial Highway
Ward	Minot	S Broadway (19th Ave SW to south city limits)
Williams	Williston	US 2 and 26th Street Intersection
Burleigh	Bismarck	43rd Ave (State St to 26th St)
Burleigh/Morton	Bismarck/Mandan	Beltway
Burleigh/Morton	Bismarck/Mandan	Northern Bridge
Grand Forks	Grand Forks	42nd St/Alerus
Stutsman	Jamestown	4th Ave RR Underpass
Cass	West Fargo	Sheyenne (40th Ave S to 52nd Ave S)

Source: North Dakota Department of Transportation.

Freight Transportation and the Impact of Transportation Investment in North Dakota

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.



large combination trucks.²⁵ The value of freight shipped to and from sites in North Dakota, in inflation-adjusted dollars, is expected to increase 58 percent by 2045 and by 128 percent for goods shipped by trucks.²⁶

Accommodating the significant increase in the movement of freight by trucks in North Dakota will be further challenged by the significant number of freight routes in North Dakota that are constrained because the roads have inadequate load carrying capacity to accommodate large trucks. The following chart and map lists portions of North Dakota highways restricted from carrying large commercial trucks.

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 North Dakota. 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 North Dakota 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, \$199 billion in goods are shipped to and from sites in North Dakota.²⁴ Twenty percent of all travel on North Dakota interstate highways is by

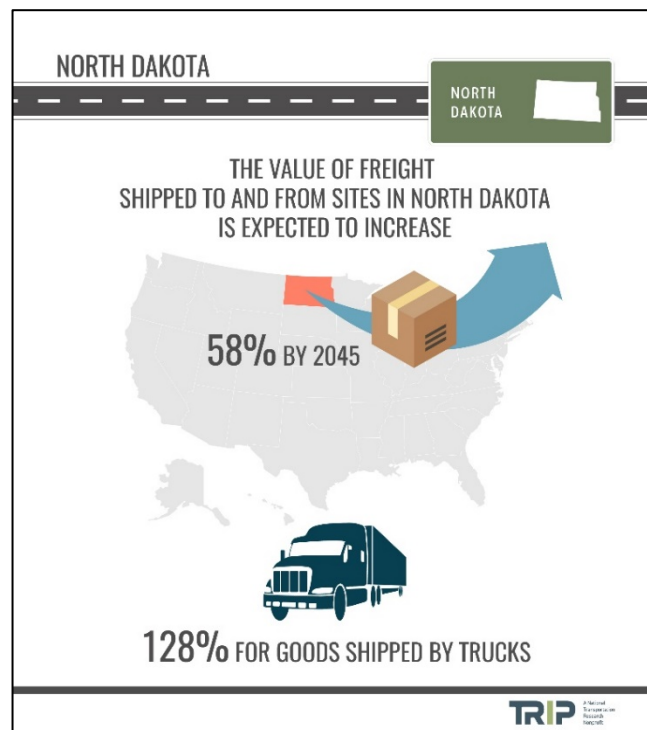
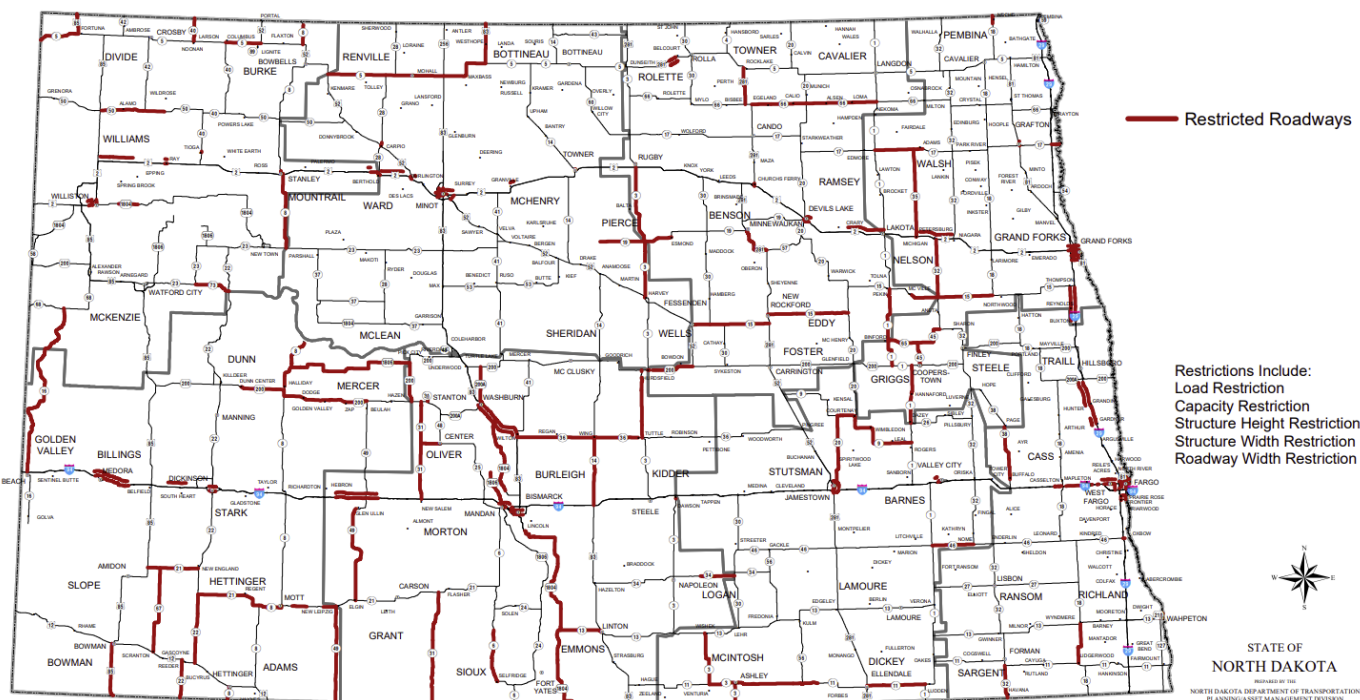


Chart 11. North Dakota Highway Freight Constraints Due to Inadequate Load Carrying Capacity

County	Route	From	To
Divide	ND Highway 5	RP 0	RP 12.38
Burke, Renville & Bottineau	ND Highway 5	RP 99.605	RP 135.563
Dickey	ND Highway 11	RP 78.332	RP 96.487
McKenzie	ND Highway 73	RP 0	RP 11.332
Dunn & Mercer	ND Highway 200	RP 113	RP 143.511
Ramsey	US Highway 281B	RP 900	RP 900.947
Wells, & Pierce	ND Highway 3	RP 159.341	RP 201.386
Adams	ND Highway 8	RP 0	RP 4.035
Burleigh	ND Highway 14	RP 0	RP 21.289
Eddy	ND Highway 15	RP 27.226	RP 52.329
Ramsey & Walsh	ND Highway 17	RP 82.122	RP 96.973
Richland	ND Highway 18	RP 11.76	RP 24.827
Pierce	ND Highway 19	RP 99.99	RP 108.81
Stutsman	ND Highway 20	RP 0	RP 22.318
Hettinger	ND Highway 21	RP 23.83	RP 44.868
Adams	ND Highway 22	RP 0	RP 11.929
Burleigh	ND Highway 36	RP 0	RP 23.907
Grant	ND Highway 49	RP 36.331	RP 67.71
Williams	ND Highway 50	RP 20.849	RP 41.095
Cavalier	ND Highway 66	RP 46	RP 78.981

North Dakota State Highway Freight Constraints 2020


Source: North Dakota Department of Transportation.



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The ability of North Dakota 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 North Dakota 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 13,258 full-time jobs across all sectors of the state economy, earning these workers approximately \$667 million annually.²⁷ These jobs include approximately 6,600 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 6,600 full-time jobs in North Dakota.²⁸ Transportation construction in North Dakota contributes an estimated \$122 million annually in state and local income, corporate and unemployment insurance taxes and the federal payroll tax.²⁹

Approximately 215,000 full-time jobs in North Dakota 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 \$10 billion in wages and contribute an estimated \$1.8 billion in state and local income, corporate and unemployment insurance taxes and the federal payroll tax.³⁰

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

Increasingly, companies are looking at the quality of a region's transportation system when deciding where to re-locate or expand. Regions with congested or poorly maintained roads may see businesses relocate to areas with a smoother, more efficient and more modern transportation system. Highway accessibility was ranked the number one site selection factor in a 2020 [survey](#) of corporate executives by Area Development Magazine.³¹

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.³²

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.³³ The benefits of TSMO can include reduced traffic congestion, reduced fuel consumption and reduced emissions.

Transportation Funding in North Dakota

Investment in North Dakota'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.

To address a lack of adequate infrastructure funding for local governments, In 2019 the state legislature passed [House Bill 1066](#), dubbed Operation Prairie Dog, which implemented changes to oil and gas production taxes and allocated up to \$125 million per year to city, county and township infrastructure investment. By November 2020, approximately \$44 million had been distributed to local governments for infrastructure investment.³⁴ As a result of reduced driving due to the COVID-19 pandemic, North Dakota anticipates collecting \$32 million less in state motor fuel taxes through June 30, 2021, with approximately \$22 million in lost revenue impacting NDDOT programs and the remaining \$10 million reducing revenues for local governments and public transit.³⁵

Revenue from North Dakota'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.³⁶ 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.³⁷

Most federal funds for highway and transit improvements in North Dakota 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.³⁸

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 North Dakota. Throughout the six years of the FAST-Act – fiscal years 2016 to 2021 – the program provided \$1.6 billion to North Dakota for road repairs and improvements, an average of \$264 million per year.³⁹ From 2014 to 2018, the federal government provided \$1.29 for road improvements in North Dakota for every \$1.00 state motorists paid in federal highway user fees, including the federal state motor fuel tax.⁴⁰

Federal funds are a critical source of highway investment in North Dakota 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 45 percent of the amount of North Dakota state capital outlays on road, highway and bridge projects, including construction, engineering and right-of-way acquisition.⁴¹

North Dakota 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 North Dakota account for 23 percent of state lane-miles and carry 83 percent of all vehicle miles of travel in the state.⁴²

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.⁴³ This backlog includes \$435 billion for highway rehabilitation; \$125 billion for bridge rehabilitation; \$120 billion for system expansion and \$106 billion for system enhancement.⁴⁴ 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.⁴⁵ The cumulative 20-year investment need to improve the nation's highways and bridges is estimated at \$2.7 trillion.⁴⁶

Conclusion

As North Dakota 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 North Dakota builds on the steps taken in 2019 to boost available transportation funding to ensure that North Dakota moves forward with a robust and reliable transportation plan capable of improving mobility and accessibility, which is vital to the state's residents, businesses and visitors.

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