

Moving into North Dakota's Future:

Meeting the State's Need for Safe and Efficient Mobility

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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 highway transportation issues. TRIP is sponsored by insurance companies, equipment manufacturers, distributors and suppliers; businesses involved in highway engineering, construction and finance; labor unions; and organizations concerned with an efficient and safe highway transportation network.

Executive Summary

North Dakota's extensive system of roads, bridges, highways and public transit provides the state's residents and visitors with a high level of mobility. As the backbone of North Dakota's surface transportation system, roads and bridges play a central role in the state's economy, including supporting the growing needs of North Dakota's expanding agricultural, manufacturing, and energy industries. North Dakota's highway transportation system enables the state's residents and visitors to go to work, visit family and friends, move goods to market, and frequent tourist attractions.

While North Dakota looks to continue to maintain a strong economy, the state needs to modernize its surface transportation system by improving the physical condition of its transportation network and enhancing the system's ability to provide efficient and reliable mobility for motorists and businesses. Making needed improvements to North Dakota's roads, highways and bridges would create jobs in the short term and ensure long-term economic growth by enhancing mobility and access.

The recently approved American Recovery and Reinvestment Act will provide a helpful down payment in funding some needed transportation repairs in North Dakota. While the approximately \$170 million in stimulus funding for highways and \$11 million for transit will allow the state to make needed improvements to its roads, highways, bridges and public transit systems, it is not sufficient to allow the state to proceed with numerous projects needed to modernize its transportation system. Even with the aid of stimulus funding, the state will still face a sizeable transportation funding shortfall in the long-term. Meeting North Dakota's need to modernize and maintain its system of roads, highways, bridges and public transit systems will require a significant, long-term boost in transportation funding at the federal, state and local level.

In 2009, Congress will deliberate over a long-range federal surface transportation program. The current legislation, the Safe, Accountable, Flexible, and Efficient Transportation Equity Act – A Legacy for Users (SAFETEA-LU), expires on September 30, 2009. The level of funding and the provisions of a future federal surface transportation program will have a significant impact on future highway and bridge conditions, level of public transit service and safety in North Dakota, which, in turn, will affect the state's ability to improve its residents' quality of life and enhance economic development opportunities.

All data used in this report is the latest available.

Without a substantial long-term boost in federal, state or local highway funding, numerous projects to improve the condition and expand the capacity of North Dakota's roads, bridges and highways will not be able to proceed, hampering the state's ability to improve the condition of its transportation system and enhance economic development opportunities in the state.

- A recent study by the North Dakota State University's Upper Great Plains Transportation Institute (UGPTI) shows that transportation funding for North Dakota's state and county roads and bridges as well as urban streets and township roads is vastly insufficient.

- According to the UGPTI report, the amount needed strictly to maintain the state and local road and bridge system is \$254 million per year greater than the amount of funding available. The report estimates that approximately \$509 million per year is needed to maintain the system, while only \$255 million per year is available.
- The unmet needs of state-maintained roads and bridges account for \$117 million of the \$254 million annual shortfall, while county roads and bridges, urban streets and township roads make up \$137 million per year.
- The UGPTI shortfall figures represent only the cost to maintain the current network of roads and bridges and do not include improvements to the system or the addition of needed roadway capacity. The shortfall figures do reflect inflationary adjustments that will be necessary in subsequent years.
- The recently approved economic stimulus package will provide a helpful down payment towards funding some needed transportation repairs in North Dakota. However, it will not be adequate to address the state's long-term need to improve road, bridge and highway conditions and address the need to expand highway capacity to meet economic development goals.
- While the approximately \$170 million in highway and \$11 million in transit stimulus funding will allow the state to make needed improvements to its roads, highways and bridges, it will not allow the state to proceed with numerous long-term projects needed to modernize its surface transportation system.
- A 2007 analysis by the Federal Highway Administration found that every \$1 billion invested in highway construction would support approximately 27,800 jobs, including approximately 9,500 in the construction sector, approximately 4,300 jobs in industries supporting the construction sector, and approximately 14,000 other jobs induced in non-construction related sectors of the economy.
- Further compounding North Dakota's transportation funding shortfall is the escalation of the cost of roadway improvements due to rapid increases in the price of key materials needed for highway and bridge construction. Over the five-year period from January 2004 to January 2009, the average cost of materials used for highway construction – including asphalt, concrete, steel, lumber and diesel – increased by 44 percent.
- To ensure that federal funding for highways and bridges in North Dakota and throughout the nation continues beyond the expiration of SAFETEA-LU, Congress needs to approve a new long-term federal surface transportation program by September 30, 2009.

- Federal funding for highways and transit in North Dakota may be cut in half later in 2009 as a result of inadequate revenue being collected into the Federal Highway Trust Fund, which funds highway and transit improvements. House Transportation & Infrastructure Committee Chairman James Oberstar sent a letter in March, 2009 to his House colleagues warning that a severe revenue shortfall in the Highway Trust Fund could result in federal funding for surface transportation could be cut in half starting on October 1, 2009, unless Congress takes steps to eliminate the funding shortfall.

One quarter – 25 percent – of North Dakota’s major roads are in poor or mediocre condition, providing motorists with a rough ride. Increased travel and the transportation of heavy loads associated with the state’s agricultural, manufacturing and energy industries places additional stress on the state’s roads.

- In 2007, five percent of North Dakota’s roads were rated in poor condition and 20 percent were rated in mediocre condition. In 2002, two percent of roads were in poor condition and 11 percent were rated in mediocre condition.
- Roads rated in poor condition may show signs of deterioration, including rutting, cracks and potholes. In some cases, poor roads can be resurfaced, but often are too deteriorated and must be reconstructed. Roads rated in mediocre condition may show signs of significant wear and may also have some visible pavement distress. Most pavements in mediocre condition can be repaired by resurfacing, but some may need more extensive reconstruction to return them to good condition.
- Roads in need of repair cost each North Dakota motorist an average of \$238 annually in extra vehicle operating costs – \$111 million state-wide. Costs include accelerated vehicle depreciation, additional repair costs, and increased fuel consumption and tire wear.
- A desirable goal for state and local organizations that are responsible for road maintenance is to have 75 percent of major roads in good condition. Fifty-seven percent of North Dakota’s major roads are in good condition.
- The expansion and growth of North Dakota’s agricultural, manufacturing and energy industries has had a positive impact on the state’s economy, creating jobs and providing additional revenue. However, many of the state’s roads were not built to accommodate the increase in traffic and the heavy loads associated with these industries. The resulting increase in truck traffic has caused significant deterioration of several state and local highways.

Twenty-two percent of North Dakota’s bridges are either structurally deficient or functionally obsolete.

- In 2008, 16 percent of North Dakota’s bridges (20 feet or longer) were rated as structurally deficient and six percent were rated functionally obsolete.
- In 2003, 18 percent of the state’s bridges were structurally deficient and six percent were functionally obsolete.

- A bridge is structurally deficient if there is a condition that warrants attention on the deck, superstructure, or substructure of the bridge. Bridges that are structurally deficient are safe for travel, but may be restricted to carrying lower weight vehicles or closed if their condition warrants such action. Functionally obsolete bridges no longer meet modern design standards for safety features such as lane widths or alignment with connecting roads or are no longer adequate for the volume of traffic being carried.
- Bridge deficiencies have an impact on mobility and safety. Restrictions on vehicle weight may cause many vehicles – especially emergency vehicles, commercial trucks, school buses and farm equipment – to use alternate routes to avoid these bridges. Narrow bridge lanes, inadequate clearances and poorly aligned bridge approaches reduce traffic safety. Redirected trips lengthen travel time, waste fuel and reduce the efficiency of the local economy.

Increases in population, as well as the expanding agriculture, manufacturing, and energy industries, have placed additional stress on the state’s highway transportation system.

- North Dakota’s population reached an estimated 640,000 in 2008 and is projected to increase to approximately 651,000 residents by 2020.
- It is estimated that vehicle travel on all of North Dakota’s state and local roads increased by 33 percent from 1990 to 2007 – jumping from 5.9 billion vehicle miles traveled in 1990 to 7.8 billion vehicle miles traveled in 2007. During that same time, lane miles on North Dakota’s major roadways increased by less than one percent.
- TRIP estimates that vehicle travel in North Dakota will increase by 25 percent in 2020 to approximately 9.9 billion miles annually.

More than 500 people were killed on North Dakota’s roads between 2004 and 2008, and the state’s traffic fatality rate has remained relatively stable in recent years. Making needed highway improvements can help reduce the number of traffic fatalities and crashes.

- From 2004 to 2008, 549 people were killed in traffic accidents in North Dakota, an average of 110 fatalities per year.
- North Dakota had a traffic fatality rate of 1.42 fatalities per 100 million vehicle miles of travel in 2007, slightly higher than the national average of 1.36.
- Although fatality rates nation-wide are dropping, North Dakota’s 2007 fatality rate of 1.43 fatalities per 100 million vehicle miles of travel has risen eight percent since 2002, when it was 1.32.
- Several factors are associated with vehicle accidents that result in fatalities, including driver behavior, vehicle characteristics and roadway conditions.

- Highway improvements such as removing or shielding obstacles, adding or improving medians, adding rumble strips, wider lanes, wider and paved shoulders, upgrading roads from two lanes to three or four lanes, better road markings, and traffic signals, all where appropriate, may reduce traffic fatalities and crashes while improving traffic flow.
- The Federal Highway Administration has found that every \$100 million spent on needed highway safety improvements will result in 145 fewer traffic fatalities over a 10-year period.

The federal surface transportation program is an essential source of funding for the construction, maintenance and improvement of North Dakota's system of roads, highways, bridges and public transit. North Dakota is heavily reliant on federal funding, receiving half of its transportation revenues from the federal government – more than double the average rate received by other states.

- North Dakota receives federal funding for its highways, bridges and public transit systems from the Federal Highway Trust Fund, under funding levels and formulas determined by Congress.
- Federal spending levels for highways and public transit are based on the current federal surface transportation program, the Safe, Accountable, Flexible, and Efficient Transportation Equity Act – A Legacy for Users (SAFETEA-LU), which was approved by Congress in 2005. The SAFETEA-LU program expires on September 30, 2009.
- From 1998 to 2007, North Dakota has been able to complete numerous highway and bridge projects and support public transit services that have improved safety and enhanced mobility and economic productivity largely due to federal transportation funds.
- From 1998 to 2007, North Dakota received approximately \$2.2 billion in federal funding for road, highway and bridge improvements and \$84 million in funding for public transit – a total of approximately \$2.3 billion in federal surface transportation funding.
- Federal funds provide 50 percent of revenues used annually by the North Dakota Department of Transportation to pay for road, highway and bridge construction, repairs and maintenance. This is double the average rate received by other states, which is 26 percent.
- Federal funds provide 55 percent of the revenue used annually to pay for the operation of the state's public transit systems as well as capital improvements to the state's public transit systems, which includes the purchase and repair of vehicles and the construction of transit facilities. This is more than triple the national average received by states for public transit, which is 17 percent.

A congressionally appointed commission recently recommended a broad overhaul of the Federal Surface Transportation Program that would significantly boost funding, consolidate the program into fewer funding categories, speed up the project delivery process, require greater accountability in project selection and expand the use of alternate funding sources.

- The National Surface Transportation Policy and Revenue Study Commission (NSTPRSC) was created by Congress to examine the current condition and future funding needs of the nation's surface transportation program, develop a plan to insure the nation's surface transportation system meets America's future mobility needs and examine funding alternatives for adequately funding the nation's future highway and transit needs.
- The Commission concluded that it is critical to the future quality of life of Americans that the nation create and sustain the preeminent surface transportation system in the world, one that is well-maintained, safe and reliable.

Key recommendations by the Commission and the American Association of State Highway Transportation Officials (AASHTO) include:

- Allocate funding through outcome-based, performance-driven programs supported by cost/benefit evaluations rather than political earmarking.
- Consolidate the more than 100 current transportation funding programs into 10 programs focused on key areas of national interest, including congestion relief, preservation of roads and bridges, improved freight transportation, improved roadway safety, improved rural access, improved environmental stewardship, and the development of environmentally-friendly energy sources.
- Speed up project development processes to reduce the excessive time required to move projects from initiation to completion by better coordinating the development and review process for transportation projects.
- Significantly boost federal funding for surface transportation. Options for increasing federal surface transportation revenues include reduced evasion of federal motor fuel taxes, moving costs of exemptions from motor fuel fees to the general fund, indexing the motor fuel tax, increasing the motor fuel tax, increased use of tolling and congestion pricing, increased use of public-private partnerships, and the imposition of freight fees.
- AASHTO has also developed a plan for a future federal surface transportation program that would be accountable for results, would make investments based on community needs and would deliver projects on time and on budget.
- AASHTO proposes that the federal surface transportation program be based on goals for meeting national objectives, be based on state-driven performance measures and be focused on six objectives of national interest: preservation and renewal, interstate commerce, safety, congestion reduction and connectivity for urban and rural areas, system operations and environmental protection.

The efficiency of North Dakota’s transportation system, particularly its highways, is critical to the health of the state’s economy. The state’s booming agricultural, manufacturing, and energy industries are reliant on an efficient and reliable transportation system to move products and services. A key component in business efficiency and success is the level and ease of access to customers, markets, materials and workers.

- Every year, \$19 billion in goods are shipped annually from sites in North Dakota and another \$24 billion in goods are shipped annually to sites in North Dakota, mostly by truck.
- Sixty-nine percent of the goods shipped annually from sites in North Dakota are carried by trucks and another eight percent are carried by courier services, which use trucks for part of their deliveries. Similarly, 70 percent of the goods shipped to sites in North Dakota are carried by trucks and another 13 percent are carried by courier services, which use trucks for part of their deliveries.
- Commercial trucking in North Dakota is projected to increase 42 percent by 2020.
- 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 transportation systems that are smoother, more reliable and efficient, and have greater load carrying capacity.
- Businesses have responded to improved communications and greater competition by moving from a push-style distribution system, which relies on low-cost movement of bulk commodities and large-scale warehousing, to a pull-style distribution system, which relies on smaller, more strategic and time-sensitive movement of goods that require an efficient and reliable transportation system.

Sources of information for this study include the U.S. Department of Transportation, the Federal Highway Administration (FHWA), the U.S. Census Bureau, the Upper Great Plains Transportation Institute, the National Highway Traffic Safety Administration (NHTSA), the National Bridge Inventory (NBI), and the Bureau of Transportation Statistics (BTS).

Introduction

North Dakota's system of roads and bridges provides the state's residents and visitors with a high level of mobility, providing the backbone of North Dakota's surface transportation system. The state's roads and bridges play a central role in the state's economy and enable residents and visitors to go to work, visit family and friends, move goods to market, and frequent tourist attractions.

The continued modernization of North Dakota's roads and bridges is crucial to providing a safer, more efficient transportation system, while improving the economic livelihood of the state and accommodating future growth. As travel on North Dakota's surface transportation system becomes more efficient, personal and commercial productivity will increase, boosting economic development statewide.

While North Dakota has not yet felt the effects of the economic downturn most states are facing, the modernization of the state's transportation system could play an important role in ensuring North Dakota's economic well being continues by creating jobs in the short term and improving the productivity and competitiveness of the state's businesses in the long term.

While the state has made progress in maintaining and modernizing its highway transportation system, many additional improvements are needed. However, North Dakota's current highway revenue is not sufficient to support all needed projects in the state. Without a significant commitment to surface transportation funding at the state and federal level, many needed projects and improvements can not move forward, jeopardizing North Dakota's future mobility and potential for economic development.

While state and local governments are responsible for maintaining most of North Dakota's roadways and bridges, the federal government plays a significant role in funding the

repairs and improvements of many of the state's most heavily used roads, highways and bridges. As North Dakota faces the challenge of preserving and modernizing its surface transportation system, the future level of federal, state and local highway funding will be a critical factor in whether the state's residents and visitors continue to enjoy access to a safe and efficient transportation network.

This report examines the condition, use, safety and funding of North Dakota's roads and bridges, as well as the state's ability to meet future mobility and needs. Sources of information for this study include the U.S. Department of Transportation, the Federal Highway Administration (FHWA), the U.S. Census Bureau, the Upper Great Plains Transportation Institute (UGPTI), the National Highway Traffic Safety Administration (NHTSA), the National Bridge Inventory (NBI), and the Bureau of Transportation Statistics (BTS).

All data used in this report is the latest available.

Population and Travel Trends in North Dakota

Shifts in the state's population and increases in the rate of travel of its residents have created additional demand on North Dakota's transportation system, particularly its key highways and roads. It is critical that North Dakota develop and maintain a modern transportation system that can accommodate future growth in population, vehicle travel and economic development.

It is estimated that North Dakota's population reached approximately 640,000 in 2008 and is projected to increase to approximately 651,000 residents by 2020.¹ From 1990 to 2007, annual vehicle miles of travel (VMT) on all of North Dakota's state and local roads increased by

33 percent, from 5.9 billion annual VMT to 7.8 billion VMT.² Vehicle travel in North Dakota is projected to increase by another 25 percent by 2020, to 9.9 billion VMT.³

While national trends show a decline in vehicle miles traveled, traffic levels in North Dakota are rising. Shifts in population and the expanding agricultural, manufacturing and energy industries have placed additional stress on the state's highway transportation system. And while North Dakota's roadway system may not be experiencing capacity issues, it is experiencing deterioration because roads are carrying heavier loads than they were designed to accommodate.

Condition of North Dakota's Roads

The life cycle of North Dakota's roads is greatly affected by the state's ability to perform timely maintenance and upgrades to ensure that road and highway surfaces last as long as possible. The pavement condition of the state's major roads is evaluated and classified as being in poor, mediocre, fair or good condition.

In 2007, one quarter of North Dakota's major roads were rated in poor or mediocre condition, providing motorists with a rough ride.⁴ Five percent of North Dakota's major roads were rated in poor condition and 20 percent were rated in mediocre condition.⁵ In 2002, two percent of the state's major roads were in poor condition and an additional 11 percent were rated in mediocre condition.⁶

Roads rated poor may show signs of deterioration, including rutting, cracks and potholes. In some cases, poor roads can be resurfaced but often are too deteriorated and must be reconstructed. Roads rated in mediocre condition may show signs of significant wear and may

also have some visible pavement distress. Most pavements in mediocre condition can be repaired by resurfacing, but some may need more extensive reconstruction to return them to good condition.

A desirable goal for state and local organizations that are responsible for road maintenance is to keep 75 percent of major roads in good condition.⁷ In North Dakota, 57 percent of the state's major roads were in good condition in 2007.⁸

Chart 1. Pavement conditions in North Dakota.

<i>Pavement Rating</i>	<i>Percentages</i>
Poor	5%
Mediocre	20%
Fair	18%
Good	57%

Source: Federal Highway Administration.

Pavement failure is caused by a combination of traffic, moisture and climate. Moisture often works its way into road surfaces and the materials that form the road's foundation. Road surfaces at intersections are even more prone to deterioration because the slow-moving or standing loads occurring at these sites subject the pavement to higher levels of stress. It is critical that roads are fixed before they require major repairs because reconstructing roads costs approximately four times more than resurfacing them.⁹ 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.

Pavement conditions in North Dakota are likely to deteriorate in the future, as the state currently lacks adequate funding to undertake roadway repairs and reconstruction at a level that will allow further improvements in pavement conditions.

The expansion of North Dakota's agricultural, manufacturing and energy industries has had a positive impact on the state's economy, creating jobs and providing additional revenue. However, many of the state's roads were not built to accommodate the increase in traffic and the heavy loads associated with these industries. The resulting increase in truck traffic has caused significant deterioration of several state and local highways.¹⁰

The Costs to Motorists of Roads in Inadequate Condition

TRIP has calculated the additional cost to motorists of driving on roads in poor or unacceptable condition. When roads are in poor condition – which may include potholes, rutting or rough surfaces – the cost to operate and maintain a vehicle increases. These additional vehicle operating costs include accelerated vehicle depreciation, additional vehicle repair costs, increased fuel consumption and increased tire wear. TRIP estimates that additional vehicle operating costs borne by North Dakota motorists as a result of poor road conditions is \$111 million annually, or \$238 per motorist.

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.¹¹

The HDM report 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 vehicle operating cost estimate is based on taking the average number of miles driven annually by a motorist, calculating current vehicle operating costs based on AAA's 2008 vehicle operating costs and then using the HDM model to estimate the additional vehicle operating costs paid by drivers as a result of substandard roads.¹² 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, as well as facilitating commerce and access for emergency vehicles.

Sixteen percent of North Dakota's bridges (20 feet or longer) were rated structurally deficient in 2008, and six percent were functionally obsolete.¹³ In 2003, 18 percent of bridges were structurally deficient and 6 percent were functionally obsolete.¹⁴

A bridge is structurally deficient if there is a condition that warrants attention on the deck, superstructure, or substructure of the bridge. Bridges that are structurally deficient are safe for travel, but may be restricted to carrying lower weight vehicles 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.

Bridges that are functionally obsolete no longer meet current highway design standards, often because of narrow lanes, inadequate under-clearances or poor roadway approach alignment.

Chart 2. Bridge Conditions in North Dakota

BRIDGE CONDITION	NUMBER OF BRIDGES	PERCENTAGE OF BRIDGES
Structurally Deficient	716	16%
Functionally Obsolete	250	6%
Total Number of Bridges	4,451	

Source: Federal Highway Administration National Bridge Inventory, 2008.

Bridge conditions in the state are projected to worsen over time if needed repairs are not made. Currently, 38 state and 964 local bridges have their structural condition rated in poor condition. However, in the absence of adequate funding for bridge repair and replacement, more than 1,350 additional North Dakota bridges are projected to deteriorate to “poor” condition over the next 20 years.¹⁵

Bridge deficiencies have an impact on mobility and safety. Restrictions on vehicle weight may cause many vehicles – especially emergency vehicles, commercial trucks, school buses and farm equipment – to use alternate routes to avoid these bridges. Narrow bridge lanes, inadequate clearances and poorly aligned bridge approaches reduce traffic safety. Redirected trips lengthen travel time, waste fuel and reduce the efficiency of the local economy.

Traffic Safety in North Dakota

A total of 549 people were killed in motor vehicle accidents in North Dakota from 2004 through 2008, an average of 110 fatalities per year.¹⁶ North Dakota's traffic fatality rate per 100 million vehicle miles of travel was 1.42 in 2007, slightly higher than the national average of 1.36.¹⁷ The state's traffic fatality rate for 2008 is not yet available because vehicle-miles-of-travel data is not yet available. While the national fatality rate has declined in recent years, North Dakota's fatality rate has increased eight percent since 2002, when it was 1.32 fatalities per 100 million vehicle miles traveled.

Chart 3. Traffic fatalities in North Dakota from 2004 – 2008.

Year	Fatalities
2004	100
2005	123
2006	111
2007	111
2008	104

Source: National Highway Traffic Safety Administration.

Three major factors are associated with fatal vehicle accidents: driver behavior, vehicle characteristics and roadway conditions. Improving safety on North Dakota's roads and highway system 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.

Making appropriate roadway improvements such as adding turn lanes, removing or shielding obstacles, adding or improving medians, widening lanes, widening and paving shoulders, improving intersection layout, and providing better road markings and upgrading or installing traffic signals may improve safety.

Transportation and Economic Development

North Dakota's highway transportation system is the backbone of the state's economy, supporting increases in business productivity. Every year, \$19 billion in goods are shipped annually from sites in North Dakota and another \$24 billion in goods are shipped annually to sites in North Dakota, mostly by truck. Sixty-nine percent of the goods shipped annually from sites in North Dakota are carried by trucks and another eight percent are carried by courier services, which use trucks for part of their deliveries.¹⁸ Similarly, 70 percent of the goods shipped to sites in North Dakota are carried by trucks and another 13 percent are carried by courier services, which use trucks for part of their deliveries.¹⁹ Commercial trucking in North Dakota is projected to increase 42 percent by 2020.²⁰

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 transportation systems that are smoother, more reliable and efficient, and have greater load carrying capacity. Currently, 512 miles of state highways have lower load carrying capacity than guidelines identified in North Dakota's Department of Transportation's Highway Performance Classification System.²¹

Businesses have responded to improved communications and greater competition by moving from a push-style distribution system, which relies on low-cost movement of bulk commodities and large-scale warehousing, to a pull-style distribution system, which relies on smaller, more strategic and time-sensitive movement of goods.

A 2007 analysis by the Federal Highway Administration found that every \$1 billion invested in highway construction would support approximately 27,800 jobs, including

approximately 9,500 in the construction sector, approximately 4,300 jobs in industries supporting the construction sector, and approximately 14,000 other jobs induced in non-construction related sectors of the economy.

The Funding of North Dakota's Surface Transportation System

The construction, repair and upkeep of North Dakota's roads, bridges and highways are paid for by local, state and federal governments, and the system is maintained largely by state and local governments.

Federal funding for North Dakota's highways and bridges comes from the Federal Highway Trust Fund, under funding levels and formulas determined by Congress. Federal spending levels for highways are based on the current federal surface transportation program, the Safe, Accountable, Flexible, and Efficient Transportation Equity Act – A Legacy for Users (SAFETEA-LU), which was approved by Congress in 2005. The SAFETEA-LU program expires on September 30, 2009.

Federal funding is a critical source of revenue for North Dakota's roadways, bridges and public transit systems. From 1998 to 2007, North Dakota received approximately \$2.2 billion in funding for road, highway and bridge improvements and \$84 million in funding for public transit – a total of approximately \$2.3 billion in federal surface transportation funding during the 10-year period.²²

North Dakota is one of the nation's rural states that receive significantly more money from the Federal Highway Trust Fund than it contributes in federal gasoline taxes. Federal funds provide 50 percent of all revenues used by the North Dakota Department of Transportation to

pay for road, highway and bridge construction, repairs, and maintenance, which is double the 26 percent average share in other states.²³

Similarly, federal funding provides 55 percent of the revenue used to pay for the operation of the state's public transit system as well as the capital improvements to the state's public transit systems, which includes the purchase and repair of vehicles and the construction of transit facilities.²⁴ This share of federal contribution to the operation and improvement of the state's public transit systems is more than triple the national average, which is 17 percent.²⁵

As a result of federal funding, over the last ten years, North Dakota has been able to complete numerous highway, bridge and public transit projects that improved safety, relieved traffic congestion, enhanced state and national economic development opportunities and improved the condition of many of the state's key transportation facilities. These improvements include numerous projects to reconstruct and modernize sections of the state's highway system, rehabilitate deteriorated roadways and bridges, add retaining walls and other elements. In carrying international through traffic, North Dakota's roadways are an integral element of the national transportation and economic system.

North Dakota faces a significant challenge in maintaining and rehabilitating or rebuilding its aging highway system and accommodating future travel demands. A recent study by the North Dakota State University's Upper Great Plains Transportation Institute (UGPTI) shows that transportation funding for North Dakota's state and county roads and bridges as well as urban streets and township roads is vastly insufficient to maintain current conditions much less improve road conditions, implement needed safety enhancements, enhance economic development opportunities and make needed bridge repairs and improvements.

According to the UGPTI report, for 2008, the amount needed strictly to maintain the state's current road and bridge system is \$254 million per year greater than the amount of

funding available. The report estimates that approximately \$509 million per year is needed to maintain the system, while only \$255 million per year is available.²⁶

Chart 4: Comparison of 2008 Roadway and Bridge System Construction & Maintenance Revenue to Needs

	Needs (UGPTI)	Current Funding	Total Shortfall*
State Roads & Bridges	\$ 242,850,000	\$ 125,800,000	\$ 117,050,000
County Roads & Bridges	\$ 159,900,000	\$ 64,260,000	\$ 95,640,000
Urban Streets	\$ 70,700,000	\$ 44,412,500	\$ 26,287,500
Township Roads	\$ 36,250,000	\$ 20,995,000	\$ 15,255,000
TOTAL	\$ 509,700,000	\$ 255,467,500	\$ 254,232,500
*Includes impact of 15% inflation on 2007 buying power			

Source: Upper Great Plains Transportation Institute

The total needs of state-maintained roads and bridges account for \$117 million of the \$254 million annual shortfall, while county roads and bridges, urban streets and township roads make up \$137 million.²⁷ The UGPTI shortfall figures represent only the cost to maintain the current network of roads and bridges and do not include improvements to the system, the addition of needed roadway capacity and new infrastructure, or operational costs.²⁸

Further compounding North Dakota’s transportation funding shortfall is the escalation of the cost of roadway improvements due to rapid increases in the price of key materials needed for highway and bridge construction. Over the five-year period from January 2004 to January 2009, the average cost of materials used for highway construction – including asphalt, concrete, steel, lumber and diesel – increased by 44 percent.

The recently approved economic stimulus package will provide a significant, short-term boost in transportation funding in North Dakota, but will not help the state address its long-term funding shortfall. While the approximately \$170 million in stimulus funding for highways and \$11 million for transit will allow the state to make needed improvements to its roads, highways, bridges and public transit systems, it will not allow the state to proceed with numerous long-term projects needed to modernize its surface transportation system.

Making needed improvements to North Dakota's roads and bridges can also help stimulate the local economy. A 2007 analysis by the Federal Highway Administration found that every \$1 billion invested in highway construction would support approximately 27,800 jobs, including approximately 9,500 in the construction sector, approximately 4,300 jobs in industries supporting the construction sector, and approximately 14,000 other jobs induced in non-construction related sectors of the economy.

Future Federal Surface Transportation Program

To ensure that federal funding for highways and public transit in North Dakota and throughout the nation continues beyond the expiration of SAFETEA-LU, Congress will need to approve new long-term federal surface transportation legislation by September 30, 2009.

The crafting of a new federal highway and transit program will occur during a time when the nation's surface transportation program faces numerous challenges, including significant levels of deterioration, increasing traffic congestion, a high number of traffic deaths, increasing construction costs and a decline in revenues going into the federal Highway Trust Fund. Federal funding for highways and transit in North Dakota may be cut in half later in 2009 as a result of inadequate revenue being collected into the Federal Highway Trust Fund, which funds highway and transit improvements. House Transportation & Infrastructure Committee Chairman James Oberstar sent a letter in March to his House colleagues warning that a severe revenue shortfall in the Highway Trust Fund could result in federal funding for surface transportation could be cut in half starting on October 1, 2009, unless Congress takes steps to eliminate the funding shortfall.

National Surface Transportation Policy and Revenue Study Commission

When Congress approved SAFETEA-LU in 2005, it recognized the tremendous challenge the nation would continue to face in maintaining and improving its highway and transit systems in order to meet the country's future mobility needs. The 2005 legislation stipulated that a national commission be created to examine the condition of the nation's surface transportation system and its future needs, and to make recommendations about the future of the nation's surface transportation program.

The National Surface Transportation Policy and Revenue Study Commission (NSTPRSC) was created by Congress to examine the current condition and future funding needs of America's surface transportation program, develop a plan to ensure the nation's surface transportation system meets the nation's future mobility needs and examine funding alternatives for adequately funding the nation's future highway and transit needs.

Comprised of transportation officials, business leaders and members of academia, the Commission held numerous field hearings, was advised by a panel of transportation experts, commissioned numerous reports and held 12 executive sessions in preparing its report.

In January, 2008, the NSTPRSC released its findings. The Commission found that at the current level of investment in surface transportation in the U.S., the nation's highways and bridges would further deteriorate, traffic casualties would increase and traffic congestion would increase, jeopardizing the nation's economic leadership due to an erosion of transportation reliability.²⁹ The Commission concluded that it is critical to the future quality of life of

Americans that the nation create and sustain the preeminent surface transportation system in the world, one that is well-maintained, safe and reliable.³⁰

The Commission recommended a broad overhaul of the Federal Surface Transportation Program that would significantly boost funding, consolidate the program into fewer funding categories, speed up the project delivery process, require greater accountability in project selection and expand the use of alternate funding sources.

Key recommendations by the Commission and the American Association of State Highway Transportation Officials (AASHTO) include:

- ✓ Allocate funding through outcome-based, performance-driven programs supported by cost/benefit evaluations rather than political earmarking.
- ✓ Consolidate the more than 100 current transportation funding programs into 10 programs focused on key areas of national interest, including congestion relief, preservation of roads and bridges, improved freight transportation, improved roadway safety, improved rural access, improved environmental stewardship and the development of environmentally-friendly energy sources.
- ✓ Speed up project development processes to reduce the excessive time required to move projects from initiation to completion by better coordinating the development and review process for transportation projects.
- ✓ Significantly boost federal funding for surface transportation. Options for increasing federal surface transportation revenues include reduced evasion of federal motor fuel taxes, moving costs of exemptions from motor fuel fees to the general fund, indexing the motor fuel tax, increasing the motor fuel tax, additional tolling, congestion pricing, increased use of public-private partnerships and freight fees.

- ✓ AASHTO proposes that the federal surface transportation program be based on goals for meeting national objectives, be based on state-driven performance measures and be focused on six objectives of national interest: preservation and renewal, interstate commerce, safety, congestion reduction and connectivity for urban and rural areas, system operations and environmental protection.
- ✓ AASHTO has also developed a plan for a future federal surface transportation program that would be accountable for results, would make investments based on community needs and would deliver projects on time and on budget.

Conclusion

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

The recently approved federal stimulus package will provide a helpful down payment for the improvement of North Dakota's surface transportation system. However, without a substantial boost in federal, state and local highway funding, numerous projects to improve the condition and expand the capacity of the state's roads, bridges and highways will not be able to proceed, hampering North Dakota's ability to improve the efficiency and safety of its surface transportation system and to enhance economic development opportunities.

In carrying international through traffic, North Dakota's roadways are an integral element of the national transportation and economic system. As North Dakota looks to meet the

challenges of preserving its investment in transportation infrastructure and providing a 21st century transportation system, the future provisions and funding levels of the next federal surface transportation program will be a critical factor in whether North Dakota is able to reap the benefits of a modern surface transportation system.

Endnotes

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- ¹ U.S. Census Bureau. www.census.gov
- ² U.S. Department of Transportation - Federal Highway Administration: Highway Statistics 2006.
- ³ TRIP estimate based on analysis of FHWA data.
- ⁴ U.S. Department of Transportation - Federal Highway Administration: Highway Statistics 2007. www.fhwa.dot.gov.
- ⁵ Ibid.
- ⁶ U.S. Department of Transportation - Federal Highway Administration: Highway Statistics 2002. www.fhwa.dot.gov.
- ⁷ Why We Must Preserve our Pavements, D. Jackson, J. Mahoney, G. Hicks, 1996 International Symposium on Asphalt Emulsion Technology.
- ⁸ U.S. Department of Transportation - Federal Highway Administration: Highway Statistics 2007. www.fhwa.dot.gov.
- ⁹ Selecting a Preventative Maintenance Treatment for Flexible Pavements. R. Hicks, J. Moulthrop. Transportation Research Board. 1999. Figure 1.
- ¹⁰ NDDOT Biennial Report, 2005-2007.
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- ¹² Your Driving Costs. American Automobile Association. 2008.
- ¹³ Federal Highway Administration National Bridge Inventory, 2008.
- ¹⁴ Federal Highway Administration National Bridge Inventory, 2003.
- ¹⁵ Upper Great Plains Transportation Institute. Statewide Conference Presentation – Annual Needs, Available Funding: Projected Shortfalls. North Dakota State University. May 2008.
- ¹⁶ U.S. Department of Transportation - Federal Highway Administration: Highway Statistics 2003-2007 www.fhwa.dot.gov and www-fars.nhtsa.dot.gov.
- ¹⁷ Ibid.
- ¹⁸ 2002 Commodity Flow Survey, U.S. Census Bureau – Bureau of Transportation Statistics. www.census.gov
- ¹⁹ Ibid.
- ²⁰ U.S. Department of Transportation: Office of Freight Management and Operations. www.fhwa.dot.gov.
- ²¹ North Dakota Department of Transportation.
- ²² TRIP analysis based on data obtained from the Federal Highway Administration and the Federal Transit Administration.
- ²³ TRIP analysis of Highway Statistics 2006, Table SF-1. Federal Highway Administration.
- ²⁴ TRIP analysis of Highway Statistics 2006, Table MT-2A.
- ²⁵ Ibid.
- ²⁶ Upper Great Plains Transportation Institute. Statewide Conference Presentation – Annual Needs, Available Funding: Projected Shortfalls. North Dakota State University. May 2008.
- ²⁷ Ibid.
- ²⁸ Ibid.
- ²⁹ National Surface Transportation Policy and Revenue Study Commission. Transportation for Tomorrow, December 2007. P. 3.
- ³⁰ Ibid. P. 7.