IOWA'S TOP TRANSPORTATION CHALLENGES:

Meeting the State's Need for Safe and Efficient Mobility

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TRIP
a national transportation research group
202-466-6706
tripnet.org

Founded in 1971, TRIP ® of Washington, DC, is a nonprofit organization that researches, evaluates and distributes economic and technical data on surface transportation issues. TRIP is sponsored by insurance companies, equipment manufacturers, distributors and suppliers; businesses involved in highway and transit engineering and construction; labor unions; and organizations concerned with efficient and safe surface transportation.

Executive Summary

Iowa's extensive system of roads, bridges, and highways provides the state's residents, visitors and businesses with a high level of mobility. This transportation system forms the backbone that supports the state's economy. Iowa's surface transportation system enables the state's residents and visitors to travel to work and school, visit family and friends, and frequent tourist and recreation attractions while providing its businesses with reliable access to customers, materials, suppliers and employees.

However, the state faces numerous challenges in providing a transportation system that is safe, well-maintained, efficient and adequately funded. As Iowa works to retain its businesses, maintain its level of economic competitiveness and achieve further economic growth, the state will need to maintain and modernize its roads, highways and bridges by improving the physical condition of its transportation network and enhancing the system's ability to provide efficient and reliable mobility for motorists and businesses. Making needed improvements to Iowa's roads, highways and bridges could also provide a significant boost to the state's economy by creating jobs in the short term and stimulating long term economic growth as a result of enhanced mobility and access.

Iowa must improve its system of roads, highways and bridges to foster economic growth and keep businesses in the state. In addition to economic growth, transportation improvements are needed to ensure safe, reliable mobility and quality of life for all residents. Meeting Iowa's need to modernize and maintain its system of roads, highways and bridges will require a significant boost in local, state and federal funding.

The federal government is a critical source of funding for Iowa's surface transportation system. Congress recently approved an eight-month extension of the federal surface transportation program, MAP-21 (Moving Ahead for Progress in the 21st Century Act), which provides the state with road, highway, bridge and transit funding through May 31, 2015.

Meeting Iowa's need to further improve and modernize its system of roads, rails and public transit will for require that the recent state funding boost is maintained and that a long-term, reliably funded, federal surface transportation program is approved.

TRANSPORTATION CHALLENGE: Deteriorated Pavement Conditions

A lack of adequate state and local funding has resulted in increasingly deteriorated pavement conditions, providing a rough ride and costing motorist in the form of additional vehicle operating costs (VOC).

- Twenty-seven percent of Iowa's major urban roads and highways have pavements in poor condition, while an additional 50 percent of the state's major urban roads are rated in mediocre or fair condition and the remaining 23 percent are rated in in good condition.

- Thirteen percent of Iowa's rural roads and highways have pavements in poor condition, while an additional 45 percent of the state's rural roads are rated in mediocre or fair condition and the remaining 42 percent are rated in in good 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.

- Driving on rough roads costs all Iowa motorists a total of $935 million annually in extra VOC. Costs include accelerated vehicle depreciation, additional repair costs, and increased fuel consumption and tire wear.

TRANSPORTATION CHALLENGE: Large Share of Deficient Bridges

More than a quarter of locally and state-maintained bridges in Iowa show significant deterioration or do not meet current design standards often because of narrow lanes, inadequate clearances or poor alignment. This includes all bridges that are 20 feet or more in length.

- Twenty-one percent of Iowa's bridges are structurally deficient. A bridge is structurally deficient if there is significant deterioration of the bridge deck, supports or other major components. Structurally deficient bridges are often posted for lower weight or closed to traffic, restricting or redirecting large vehicles, including commercial trucks and emergency services vehicles.

- There are a total of 5,022 structurally deficient bridges in Iowa, the second highest number of structurally deficient bridges in the nation, behind only Pennsylvania.

- Five percent of Iowa's bridges are functionally obsolete. Bridges that are functionally obsolete no longer meet current highway design standards, often because of narrow lanes, inadequate clearances or poor alignment.

- In the Des Moines area, 11 percent of bridges are structurally deficient and 13 percent are functionally obsolete.

TRANSPORTATION CHALLENGE: High Rural Traffic Fatality Rates

Improving safety features on Iowa's roads and highways would likely result in a decrease in the state's traffic fatalities and serious crashes. It is estimated that roadway features are likely a contributing factor in approximately one-third of all fatal and serious traffic crashes.

- Between 2009 and 2013 a total of 1,803 people were killed in traffic crashes in Iowa, an average of 361 fatalities per year.

- The fatality rate on Iowa's rural non-Interstate roads was 1.66 fatalities per 100 million vehicle miles of travel in 2013, more than three times the 0.50 fatality rate on all other roads and highways in the state.

- Each year, Iowa motorists lose $654 million in the form of the financial cost of traffic crashes, including insurance costs and lost household productivity.

- 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. The cost of serious crashes includes lost productivity, lost earnings, medical costs and emergency services.

- Several factors are associated with vehicle crashes that result in fatalities, including driver behavior, vehicle characteristics and roadway features. TRIP estimates that roadway features are likely a contributing factor in approximately one-third of fatal traffic crashes.

- Where appropriate, highway improvements can reduce traffic fatalities and crashes while improving traffic flow to help relieve congestion. Such improvements include removing or shielding obstacles; adding or improving medians; improved lighting; adding rumble strips, wider lanes, wider and paved shoulders; upgrading roads from two lanes to four lanes; and better road markings and traffic signals.

- Investments in rural traffic safety have been found to result in significant reductions in serious traffic crashes. A 2012 report by the Texas Transportation Institute (TTI) found that improvements completed recently by the Texas Department of Transportation that widened lanes, improved shoulders and made other safety improvements on 1,159 miles of rural state roadways resulted in 133 fewer fatalities on these roads in the first three years after the improvements were completed (as compared to the three years prior). TTI estimates that the improvements on these roads are likely to save 880 lives over the next 20 years.

TRANSPORTATION CHALLENGE: Economic Growth Threatened by Increasingly Crowded Roads

The efficiency of Iowa's transportation system, particularly its highways, is critical to the health of the state's economy. Increasing levels of traffic congestion cause significant delays in Iowa, particularly in its larger urban areas, choking commuting and commerce.

- According to a recently completed study conducted by the Battelle Technology Partnership Practice on behalf of the Iowa Economic Development Authority, "Despite Iowa's well-developed freight transportation system, the Synchronist survey of industry executives reveals frequent concern about need for highway improvements. It was rated as one of the most serious economic development weaknesses found in Iowa, just behind the availability of skilled workforce."

- Iowa's population reached approximately 3.1 million residents in 2013, an 11 percent increase since 1990. Iowa has approximately 2.2 million licensed drivers.

- Vehicle miles traveled (VMT) in Iowa increased by 38 percent from 1990 to 2013 – from 23 billion VMT in 1990 to 31.6 billion VMT in 2013. By 2030, vehicle travel in Iowa is projected to increase by another 20 percent.

- From 1990 to 2013, Iowa's gross domestic product, a measure of the state's economic output, increased by 65 percent, when adjusted for inflation.
- Increasing levels of congestion add significant costs to consumers, transportation companies, manufacturers, distributors and wholesalers and can reduce the attractiveness of a location to a company to consider expansion or even to locate a new facility. Congestion costs can also increase overall operating costs for trucking and shipping companies, leading to revenue losses, lower pay for drivers and employees, and higher consumer costs.
- Traffic congestion costs Iowa's motorist $380 million annually in the form of lost time and wasted fuel as a result of traffic congestion.
- Annually, $157 billion in goods are shipped from sites in Iowa and another $142 billion in goods are shipped to sites in Iowa, mostly by truck. Eighty-one percent of the goods shipped annually from sites in Iowa are carried by trucks and another nine percent are carried by courier services or multiple mode deliveries, which include trucking.
- 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.
- 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 two site selection factor behind only the availability of skilled labor in a 2013 survey of corporate executives by Area Development Magazine.

TRANSPORTATION CHALLENGE: Inadequate Transportation Funding

Without a significant boost in transportation funding at the local, state and federal level, the condition, efficiency and safety of Iowa's surface transportation system will decline.

- The Iowa Department of Transportation estimates the state faces an annual transportation funding shortfall of $215 million in order to meet the state's most critical public roadway needs.
- The declining condition of Iowa's highways and reduced availability of highway improvement funding through the existing gas tax is now among the top concerns of industry executives across the state.
- Driving on deficient roads cost Iowa's drivers approximately $2 billion annually in the form of additional vehicle operating costs including accelerated vehicle depreciation, additional repair costs, and increased fuel consumption and tire wear ($935 million); the

cost of lost time and wasted fuel due to traffic congestion ($380 million); and the financial cost of traffic crashes ($654 million).

- The Federal Highway Administration estimates that each dollar spent on road, highway and bridge improvements results in an average benefit of $5.20 in the form of reduced vehicle maintenance costs, reduced delays, reduced fuel consumption, improved safety, reduced road and bridge maintenance costs and reduced emissions as a result of improved traffic flow.

- Signed into law in July 2012, MAP-21 (Moving Ahead for Progress in the 21st Century Act), has improved several procedures that in the past had delayed projects, MAP-21 does not address long-term funding challenges facing the federal surface transportation program.

- Congress recently approved the Highway and Transportation Funding Act of 2014, an eight-month extension of the federal surface transportation program, on which states rely for road, highway, bridge and transit funding. The program, initially set to expire on September 30, 2014, will now run through May 31, 2015. In addition to extending the current authorization of the highway and public transportation programs, the legislation will transfer nearly $11 billion into the Highway Trust Fund (HTF) to preserve existing levels of highway and public transportation investment through the end of May 2015.

- A significant boost in investment on the nation's roads, highways, bridges and public transit systems is needed to improve their condition and to meet the nation's transportation needs, concluded a new report from the American Association of State Highway and Transportation Officials.

- The 2015 AASHTO Transportation Bottom Line Report found that annual investment in the nation's roads, highways and bridges needs to increase from $88 billion to $120 billion and from $17 billion to $43 billion in the nation's public transit systems, to improve conditions and meet the nation's mobility needs.

- The 2015 AASHTO Transportation Bottom Line Report also found that the current backlog in needed road, highway and bridge improvements is $740 billion.

Sources of information for this report include the Federal Highway Administration (FHWA), the Bureau of Transportation Statistics (BTS), the Iowa Department of Transportation (IDOT), the U.S. Census Bureau, the American Association of State Highway and Transportation Officials (AASHTO), the Texas Transportation Institute (TTI) and the National Highway Traffic Safety Administration (NHTSA). All data used in the report is the latest available.

Introduction

Iowa's roads, highways, and bridges form vital transportation links for the state's residents, visitors and businesses, providing daily access to homes, jobs, shopping, natural resources and recreation. Today, with the Hawkeye State striving to foster quality of life improvements and economic competitiveness, the modernization of Iowa's transportation system is crucial, particularly to critical areas of the state's economy including agriculture, advanced manufacturing, biotechnology, finance and insurance services, and government services.

As the U.S. and Iowa work to sustain long-term economic growth, the preservation and modernization of the state's transportation system must play an important role in retaining Iowa's economic competitiveness and improving its economic well-being by providing critically needed jobs in the short term and by improving the productivity and competitiveness of the state's businesses in the long term.

However, the state faces numerous challenges in providing a transportation system that is safe, well-maintained, efficient and adequately funded. As Iowa faces the challenge of preserving and modernizing its transportation system, the future level of federal, state and local transportation 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. Meeting Iowa's need to modernize and maintain its system of roads, highways and bridges will require significant local, state and federal funding.

Congress recently approved an eight-month extension of the federal surface transportation program, MAP-21 (Moving Ahead for Progress in the 21st Century Act), on which states rely for road, highway, bridge and transit funding, through May 31 2015.

Making progress in addressing Iowa need to improve its surface transportation system will require that the recent boost in state transportation funding is fully implemented and that an adequately funded, long term federal surface transportation program is approved by Congress.

This report examines the condition, use and safety of Iowa's roads, highways and bridges, federal, state and local funding needs, and the future mobility needs of the state.

Population, Travel and Economic Trends in Iowa

Iowa's 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 the demand for mobility as well as an increase in vehicle miles of travel (VMT). To foster a high quality of life and spur economic growth in Iowa, it will be critical that the state provide a safe and modern transportation system that can accommodate future growth in population, tourism, recreation and vehicle travel.

Iowa's population grew to approximately 3.1 million residents in 2013, an 11 percent increase since 1990.[1] Iowa has approximately 2.2 million licensed drivers.[2] From 1990 to 2013, Iowa's gross domestic product (GDP), a measure of the state's economic output, increased by 65 percent, when adjusted for inflation.[3]

From 1990 to 2013, annual VMT in Iowa increased by 38 percent, from 23 billion miles to 31.6 billion miles.[4] Based on population and other lifestyle trends, TRIP estimates that travel on Iowa's roads and highways will increase by another 20 percent by 2030.[5]

Condition of Iowa's Roads

The life cycle of Iowa's roads is greatly affected by the state and local government's ability to perform timely maintenance and upgrades to ensure that road and highway surfaces last as long as possible.

Twenty-seven percent of Iowa's major urban roads and highways have pavements in poor condition, while an additional 50 percent of the state's major urban roads are rated in mediocre or fair condition and the remaining 23 percent are rated in in good condition. [6]

Thirteen percent of Iowa's rural roads and highways have pavements in poor condition, while an additional 45 percent of the state's rural roads are rated in mediocre or fair condition and the remaining 42 percent are rated in in good condition.[7]

The pavement data in this report for all arterial roads and highways is provided by the Federal Highway Administration, based on data submitted annually by the Iowa Department of Transportation (IDOT) on the condition of major state and locally maintained roads and highways in the state.

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 to five times more than resurfacing them.[8] 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.

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 (VOC) include accelerated vehicle depreciation, additional vehicle repair costs, increased fuel consumption and increased tire wear. TRIP estimates that additional vehicle operating costs borne by Iowa motorists as a result of poor road conditions is $935 million annually.[9]

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.[10]

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 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 2013 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.[11] 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 Iowa

Iowa'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.

More than a quarter of Iowa's locally and state- maintained bridges (20 feet or longer) are currently rated as structurally deficient or functionally obsolete.

Twenty-one percent of Iowa's locally and state maintained bridges are rated as structurally deficient, the third highest share in the nation.[12] There are a total of 5,043 structurally deficient bridges in Iowa, the second highest number of structurally deficient bridges in the nation.[13] A bridge is structurally deficient if there is significant deterioration of the bridge deck, supports or other major components. Bridges that are 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.

Five percent of Iowa's locally and state maintained bridges are rated functionally obsolete.[14] Bridges that are functionally obsolete no longer meet current highway design standards, often because of narrow lanes, inadequate clearances or poor alignment with the approaching roadway.

The service life of bridges can be extended by performing routine maintenance such as resurfacing decks, painting surfaces, insuring that a facility has good drainage and replacing deteriorating components. But most bridges will eventually require more costly reconstruction or major rehabilitation to remain operable.

Traffic Safety in Iowa

A total of 1,803 people were killed in motor vehicle crashes in Iowa from 2009 through 2013, an average of 361 fatalities per year.[15]

Chart 1. Traffic fatalities in Iowa from 2009 – 2013.

Year	***Fatalities***
2009	371
2010	390
2011	360
2012	365
2013	317
Total	**1,803**

Source: Iowa Department of Transportation

Each year, Iowa motorists lose $654 million in the form of the financial cost of traffic crashes, including insurance costs and lost household productivity.[16]

Three major factors are associated with fatal vehicle crashes: driver behavior, vehicle characteristics and roadway features. It is estimated that roadway features are likely a

contributing factor in approximately one-third of fatal traffic crashes. Roadway features that impact safety include the number of lanes, lane widths, lighting, lane markings, rumble strips, shoulders, guard rails, other shielding devices, median barriers and intersection design.

Iowa's overall traffic fatality rate was 1.00 fatalities per 100 million vehicle miles of travel in 2013.[17] The fatality rate on Iowa's non-Interstate rural roads was 1.66 fatalities per 100 million vehicle miles of travel in 2013, more than three times the fatality rate of 0.50 on all other roads and highways in the state.[18]

Improving safety on Iowa'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 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.

Roads with poor geometry, with insufficient clear distances, without turn lanes, having inadequate shoulders for the posted speed limits, or poorly laid out intersections or interchanges, pose greater risks to motorists, pedestrians and bicyclists.

Investments in rural traffic safety have been found to result in significant reductions in serious traffic crashes. A 2012 report by the Texas Transportation Institute (TTI) found that improvements completed recently by the Texas Department of Transportation that widened lanes, improved shoulders and made other safety improvements on 1,159 miles of rural state roadways resulted in 133 fewer fatalities on these roads in the first three years after the

improvements were completed (as compared to the three years prior). TTI estimates that the improvements on these roads are likely to save 880 lives over the next 20 years.[19]

Traffic Congestion in Iowa

Traffic congestion causes delays in Iowa, particularly in its larger urban areas, choking commuting and commerce. Traffic congestion robs commuters of time and money and imposes increased costs on businesses, shippers and manufacturers, which are often passed along to the consumer. Traffic congestion costs Iowa's motorists $380 million annually in the form of lost time and wasted fuel as a result of traffic congestion.[20]

Increased levels of congestion can reduce the attractiveness of a location to a company to consider expansion or even to locate a new facility. And, the costs associated with congestion can increase overall operating expenses for trucking and shipping companies, leading to revenue losses, lower pay for employees, and higher consumer costs.

Transportation Funding

Without a significant boost in transportation funding at the local, state and federal level, the condition, efficiency and safety of Iowa's transportation system will decline. Iowa currently faces a significant backlog in needed transportation funding.

The Iowa Department of Transportation estimates the state faces an annual transportation funding shortfall of $215 million in order to meet the state's most critical public roadway.[21]

Investment in Iowa's roads, highways and bridges is funded by local, state and federal governments. The federal government provides funding for the state's transportation system largely as part of MAP-21 (Moving Ahead for Progress in the 21st Century Act), the current two-year federal surface transportation program, which expires on May 31, 2015.

The federal government is a critical source of funding for Iowa's roads, highways, bridges and transit systems and provides a significant return to Iowa in road and bridge funding based on the revenue generated in the state by the federal motor fuel tax.

Federal funds for highway and transit improvements in Iowa are provided through the federal Highway Trust Fund, which raises revenue through federal user fees, largely an 18.4 cents-per-gallon tax on gasoline and a 24.4 cents-per-gallon tax on diesel fuel. Since 2008 revenue into the federal Highway Trust Fund has been inadequate to support legislatively set funding levels so Congress has transferred approximately $53 billion in general funds and an additional $2 billion from a related trust fund into the federal Highway Trust Fund.[22]

Signed into law in July 2012, MAP-21 has improved several procedures that in the past had delayed projects. MAP-21 does not address long-term funding challenges facing the federal surface transportation program. Congress recently approved the Highway and Transportation Funding Act of 2014, an eight-month extension of the federal surface transportation program on which states rely for road, highway, bridge and transit funding. The program, initially set to expire on September 30, 2014, will now run through May 31, 2015. In addition to extending the current authorization of the highway and public transportation programs, the legislation will

transfer nearly $11 billion into the Highway Trust Fund (HTF) to preserve existing levels of highway and public transportation investment through the end of May 2015.

A significant boost in investment on the nation's roads, highways, bridges and public transit systems is needed to improve their condition and to meet the nation's transportation needs, concluded a new report from the American Association of State Highway and Transportation Officials.

The 2015 AASHTO Transportation Bottom Line Report found that annual investment in the nation's roads, highways and bridges needs to increase from $88 billion to $120 billion and from $17 billion to $43 billion in the nation's public transit systems, to improve conditions and meet the nation's mobility needs.[23]

The 2015 AASHTO Transportation Bottom Line Report also found that the current backlog in needed road, highway and bridge improvements is $740 billion.[24] The backlog includes a $392 billion backlog for road and highway rehabilitation, a $112 billion backlog in needed bridge rehabilitation and a $237 billion backlog in needed highway capacity additions.[25]

Importance of Transportation to Economic Growth

Today's culture of business demands that an area have well-maintained and efficient roads, highways and bridges if it is to remain economically competitive. Global communications and the impact of free trade in North America and elsewhere have resulted in a significant increase in freight movement, making the quality of a region's transportation system a key component in a business's ability to compete locally, nationally and internationally.

Businesses have responded to improved communications and the need to cut costs with a variety of innovations including just-in-time delivery, increased small package delivery, demand-side inventory management and e-commerce. The result of these changes has been a significant improvement in logistics efficiency as firms move from a push-style distribution system, which relies on large-scale warehousing of materials, to a pull-style distribution system, which relies on smaller, more strategic movement of goods. These improvements have made mobile inventories the norm, resulting in the nation's trucks literally becoming rolling warehouses.

Highways are vitally important to continued economic development in Iowa, particularly to the state's tourism, agriculture, advanced manufacturing, entertainment, and financial services industries. As the economy expands, creating more jobs and increasing consumer confidence, the demand for consumer and business products grows. In turn, manufacturers ship greater quantities of goods to market to meet this demand, a process that adds to truck traffic on the state's highways and major arterial roads.

Every year, $157 billion in goods are shipped from sites in Iowa and another $142 billion in goods are shipped to sites in Iowa, mostly by trucks.[26] Eighty-one percent of the goods shipped annually from sites in Iowa are carried by trucks and another nine percent are carried by courier services or multiple-mode deliveries, which include trucking.[27]

The cost of road and bridge improvements are more than offset by the reduction of user costs associated with driving on rough roads, the improvement in business productivity, the reduction in delays and the improvement in traffic safety. The Federal Highway Administration estimates that each dollar spent on road, highway and bridge improvements results in an average benefit of $5.20 in the form of reduced vehicle maintenance costs, reduced delays, reduced fuel consumption, improved safety, reduced road and bridge maintenance costs and reduced emissions as a result of improved traffic flow.[28]

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. In fact, highway accessibility was ranked the number two site selection factor behind only the availability of skilled labor in a 2013 survey of corporate executives by Area Development Magazine.[29] In addition, "Transportation Infrastructure" ranks first on site selectors' list of the most important location criteria according to Site Selection magazine's 2014 survey of corporate real estate executives.[30]

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. According to the Iowa Economic Development Authority's Battelle Report Summary, "the declining condition of Iowa's highways and reduced availability of highway improvement funding through the existing gas tax is now among the top concerns of industry executives across the state." [31]

According to the Battelle report, "Despite Iowa's well-developed freight transportation system, the Synchronist survey of industry executives reveals frequent concern about need for highway improvements. It was rated as one of the most serious economic development weaknesses found in Iowa, just behind the availability of skilled workforce." [32]

Conclusion

As Iowa works 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, bridges and public transit systems that can accommodate the mobility demands of a modern society.

And as the nation looks to sustain long-term economic growth, the U.S. will need to modernize its surface transportation system by improving the physical condition of its transportation network and enhancing the system's ability to provide efficient and reliable mobility for motorists and businesses. Making needed improvements to Iowa's roads, highways, and bridges will provide a significant boost to the state's economy by creating jobs in the short term and stimulating long term economic growth as a result of enhanced mobility and access.

Without substantial and reliable federal, state and local transportation funding, numerous projects to improve the condition and expand the capacity of Iowa's transportation system will not be able to proceed, hampering the state's ability to improve the condition of its transportation system and to enhance economic development opportunities in the state.

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