

The Interstate Highway System in Wisconsin:

Saving Lives, Time and Money

*A report on the condition, impact, use and future needs of
Wisconsin's Interstate Highway System*

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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 supported 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

Fifty years ago the nation embarked on its greatest public works project, the construction of the Interstate Highway System. President Dwight D. Eisenhower provided strong support for the building of an Interstate Highway System that would improve traffic safety, reduce travel times and improve the nation's economic productivity.

Serving as the most critical transportation link in the state's economy, Wisconsin's Interstate highways have significantly improved the lives of its residents and visitors. In Wisconsin, and throughout the nation, the Interstate system allows for high levels of mobility by greatly reducing travel times and providing a significantly higher level of traffic safety than other routes.

But 50 years after President Eisenhower articulated a vision for the nation's 20th century transportation system, Wisconsin and the nation again face a challenge in modernizing the system of aging, increasingly congested Interstate highways. If Wisconsin residents are to continue to enjoy their current level of mobility on Interstate highways and bridges, the state will need to make a commitment to providing the public with a 21st Century highway system.

In this report, TRIP looks at the history and benefits of Wisconsin's Interstate Highway System, its current use and condition and finally at the future needs of the state's most critical transportation system. Sources of data for this study include the U.S. Department of Transportation (USDOT), the Federal Highway Administration (FHWA), the National Highway Traffic Safety Administration (NHTSA), the U.S. Census Bureau and the Wisconsin Department of Transportation (WDOT). The major findings of the report are:

The Dwight D. Eisenhower National System of Interstate and Defense Highways, which has been called the most ambitious public works project built since the Roman Empire, is the most critical link in the nation's and Wisconsin's transportation system.

- Wisconsin's Interstate system, which includes one percent of all roadway lane miles in the state, carries 18 percent of all vehicle travel in the state.
- Since Interstate construction began in 1956, total vehicle miles of travel in Wisconsin have more than quadrupled, increasing by 349 percent. Since that time, the number of vehicles in the state has more than tripled, increasing by 227 percent, and the state's population has increased by 47 percent.

The state's Interstate Highway System saves the average Wisconsin resident \$1,761 per year in saved lives, saved time, reduced motor fuel consumption and reduced apparel, food, housing and transportation costs. The total statewide savings is \$9.7 billion.

- Improved traffic safety provided by the Interstate system saves the state \$380 million annually and the average state resident \$69 annually in reduced healthcare costs and costs associated with lost productivity.
- By reducing travel times, the Interstate system saves each Wisconsin resident 22 hours of travel time annually - 123 million hours statewide.
- The Interstate system saves Wisconsin residents \$1.8 billion annually in the value of saved time - \$331 per person.
- Wisconsin's Interstate system annually reduces statewide motor fuel consumption by 59 million gallons and saves the average person in the state \$26 per year in reduced fuel costs.
- Consumer costs have been significantly lowered by the Interstate Highway System. The cost of transporting goods has been reduced because the time it takes to make trips has been decreased. Increased access between locations has enabled access to cheaper land.
- TRIP estimates that consumer costs in Wisconsin for apparel, food, housing and transportation are reduced by \$7.4 billion annually, or \$1,335 per state resident, as a result of the Interstate Highway System.
- TRIP's estimates of reduced consumer costs are based on consumer expenditure estimates by the U.S. Department of Labor and estimates of the Interstate's impact on consumer costs collected in a survey of transportation economist.

Construction of the Interstate system in Wisconsin started in 1956, providing the state with 743 miles of Interstate highways, connecting the state's largest urban areas and Wisconsin to the rest of the nation.

- The Federal-Aid Highway Act of 1956, signed into law by President Dwight Eisenhower on June 29th, 1956, called for the construction of a 41,000 mile system of Interstate highways to be paid for by taxes on motorists, such as the federal motor fuel tax. The federal motor fuel tax was set at three cents-per-gallon and is now 18.4 cents-per-gallon.

- The development of Wisconsin's Interstate system was in two stages. The initial stage, completed by the 1980s, was the construction of the Interstate highways designated by the 1956 Interstate act, including Interstates 43, 90, 94, 535, 794, and 894.
- Following the completion of Wisconsin's designated Interstate highway system, the state focused on upgrading other critical highways to Interstate standards, including State Highway 15, which became Interstate 43 from Beloit to Milwaukee and U.S. 51, which became a portion of Interstate 39 from Portage to Wausau.
- The first section of Interstate completed in Wisconsin was a one-mile segment of Interstate 94 near Johnson Creek in Jefferson County, which opened to traffic in 1956.
- The first Interstate portion completed in Milwaukee was a portion of Interstate 94 from 13th Street to 68th Street, which opened to traffic in 1962.
- The most recent section of Wisconsin's Interstate system open to traffic was Interstate 39 from Portage to Wausau, which opened in the 1990s.
- The majority of the state's Interstate system was completed by 1986. By 1986, 78 percent of the state's eventual 3,219 Interstate lane miles were open to traffic.

Approximately a third of Wisconsin's urban Interstates are congested as a result of continued growth in travel.

- Thirty-two percent of Wisconsin's urban Interstates are considered congested because they carry traffic levels that result in significant delays during peak travel hours.
- The average annual amount of travel per Interstate lane-mile in Wisconsin increased by 41 percent from 1990 to 2004, from an average of approximately 2.3 million miles traveled annually per Interstate lane-mile to approximately 3.3 million.
- Six percent of Wisconsin's rural Interstate miles are considered congested because they carry high traffic volumes.

Wisconsin faces a significant challenge in maintaining the physical condition of its aging Interstate system and expanding Interstate capacity to address growing traffic congestion.

- Travel on Wisconsin's Interstate highways is expected to increase by 31 percent by the year 2026.
- Large commercial truck travel on Wisconsin's Interstate highways is expected to increase by 65 percent by the year 2026, by which time large trucks will account for 24 percent of all Interstate vehicle travel.
- Increasing urban traffic congestion may erode some of the logistics advantages that Wisconsin producers and distributors have over competitors as the cost and reliability of shipping goods is negatively affected.
- The Wisconsin Department of Transportation reports that by the year 2016, 43 percent of the state's Interstate Highway System (318 of 743 miles) will be in need of significant rehabilitation or reconstruction.
- The Southeastern Wisconsin Regional Planning Commission (SWRPC) reports that the cost to reconstruct the 270-mile freeway system of the state's seven Southeastern counties is \$5.9 billion, excluding the cost of the current reconstruction of the Marquette Interchange.
- The reconstruction plan for Southeastern Wisconsin's freeway system, which is mostly Interstate highways, calls for the widening of 127 of the 270 miles to accommodate growing traffic.
- An analysis of expected traffic increases on Wisconsin's rural Interstates indicate that approximately 160 miles of these routes need to be widened from four to six-lanes by the year 2026.
- Segments of Wisconsin's rural Interstates that need to be widened include 94 from Eau Claire to the Minnesota border, Interstates 94/90 from Tomah to Portage, Interstate 90 from Madison to the Illinois border, and Interstate 94 from Madison to the Waukesha county line.
- Wisconsin is currently making upgrades to State Highway 45/41 from the Zoo to Green Bay so that this route can eventually be designated as an Interstate highway.

Wisconsin's Interstates provide travelers with a network of highways with a variety of safety designs that greatly reduce the likelihood of serious accidents. Travel on Wisconsin's Interstate highways is approximately three times safer than travel on all other roadways in the state.

- Wisconsin's Interstate highways have saved approximately 3,000 lives in the state since 1956, based on an estimate of the number of traffic deaths that would have occurred if Wisconsin did not have Interstate highways.
- The number of lives saved by the Interstate was calculated by estimating the additional fatalities that would have occurred had Interstate traffic been carried by other major roadways in the state, which often have higher traffic fatality rates and may lack the safety features common to Interstate routes.
- Wisconsin's Interstate system has saved an average of 100 lives per year over the last 10 years, based on the above criteria.
- The features that make Interstates safer than other roads include: a separation from other roads and rail lines, a minimum of four-lanes, gentler curves and often paved shoulders, median barriers and rumble strips to warn drivers when they are leaving the roadway.
- Travel on Wisconsin's Interstate highways is approximately three times safer than travel on all other roadways. The fatality rate per 100 million vehicle miles of travel on Wisconsin's Interstate system in 2004 was 0.48, while it was 1.49 on non-Interstate routes in Wisconsin.

Overall, current pavement and bridge conditions on most of Wisconsin's Interstate system are acceptable, but some deficiencies exist.

- Three percent of Wisconsin's Interstate pavements are in poor condition and an additional 14 percent are in mediocre condition. Another 27 percent of Interstate pavements are in fair condition and the remaining 56 percent are in good condition.
- Eight percent of the state's Interstate bridges are rated structurally deficient and nine percent are rated functionally obsolete.
- A bridge is structurally deficient if there is significant deterioration of the bridge deck, supports or other major components. Bridges that are functionally obsolete no longer meet current highway design standards, often because of narrow lanes, inadequate clearances or poor alignment.

- The average age of Wisconsin's Interstate bridges is 37 years. Older bridges typically need significant repairs, reconstruction or replacement at approximately 50 years.

The Interstate system is the backbone of the Wisconsin economy and has played a critical role in improving business productivity in the state.

- The Interstate system carries 41 percent of all large commercial truck travel in Wisconsin. Travel by large commercial trucks accounted for 18 percent of all vehicle travel on the state's Interstate system in 2004.
- Every year, \$217 billion in goods are shipped annually from sites in Wisconsin and another \$183 billion in goods are shipped annually to sites in Wisconsin, mostly by truck.
- Seventy-nine percent of the goods shipped annually from sites in Wisconsin are carried by trucks and another 10 percent are carried by courier services, which use trucks for part of the deliveries. Similarly, 80 percent of the goods shipped to sites in Wisconsin are carried by trucks and another 10 percent are carried by courier services, which use trucks for part of their deliveries.
- The Interstate system has led to significant increases in economic productivity. Improvements in the highway system have allowed businesses to adopt more efficient logistics practices, which reduce costs for producers and consumers.
- The initial construction of much of the Interstate system provided a tremendous boost to business productivity as a result of more efficient goods shipment. Economists have estimated that from the initial phase of Interstate construction in 1956 to 1970, the annual rate of return for every dollar of public investment in highway construction was 54 cents, which meant that investments recovered their costs in two years.
- The completion of the vast majority of the Interstate system by the 1980s and the deregulation of the U.S. trucking industry resulted in a significant improvement in the competitiveness of U.S. business. In fact, the cost of moving freight, as measured by U.S. business logistics costs, dropped from 16 percent of U.S. Gross Domestic Product (GDP) in 1980 to nine percent in 2002.
- Wisconsin's Interstate highways have reduced travel times both within the state and to locations outside of Wisconsin. The improved mobility provided by the Interstate system has given Wisconsin's residents greater choices about where they live, work, shop and spend their leisure time.

Introduction

The Dwight D. Eisenhower National System of Interstate and Defense Highways has been called the most ambitious public works project built since the age of the Roman Empire and is literally the backbone of America's economy.

Initially conceived in 1939, significant construction of the Interstate system did not start until 1956 when Congress approved the financing of today's Interstate system, largely through collection of the federal motor fuel tax and other taxes on highway users.

With four Interstates running from the Illinois border north to the central part of the state and northwest into Minnesota, and connecting the state's major urban areas, Wisconsin's Interstate Highway System is the most critical element of the state's transportation system. Fifty years after construction of the Interstate Highway System began, this network of highways has become the most important set of corridors linking Wisconsin's citizens to people and businesses within the state and throughout the nation.

Today, the Interstate continues to provide Wisconsin with economic growth, improved traffic safety and convenient access while playing a vital role in the nation's defense.

In this report, TRIP looks at the history and impact of Wisconsin's Interstate Highway System, its current use and condition, the system's benefits and finally at the future needs of the state's most critical transportation system. Just as 50 years ago, when our leaders made critical decisions on the future of the nation's highway system, today's political leaders now face challenge of insuring that the safety and reliability of the Interstate system are maintained by investing adequately in needed repairs and improvements to meet the transportation challenges of the 21st Century.

Development of the U.S. Interstate System

In 1919, Lieutenant Dwight D. Eisenhower participated in the U.S. Army's first transcontinental motor convoy, from Washington, DC to San Francisco. During the 62 days it took to cross the country, the convoy experienced numerous difficulties, including roads that were muddy, narrow or otherwise inadequate and bridges that often could not support the vehicles in the convoy.

A generation later, General Eisenhower saw first hand how an efficient, effective highway transportation system benefited a nation, when he noted that the German Autobahn network, opened in 1935, provided a significant military advantage to Germany.

The United States also began exploring the feasibility of constructing a series of interregional highways in the late 1930s. In 1938 Congress directed the then Bureau of Public Roads (BPR) to prepare a study on the possibility of building a national system of toll highways. The resulting 1939 BPR report concluded that it would be impossible to finance a national system of highways strictly through charging tolls, but did recommend that the U.S. build a system of approximately 26,700 miles of transcontinental highways. The BPR report also called for many of the design elements found on modern Interstate highways, including limited access, which separates highway traffic from other traffic and from trains. The BPR report also suggested that the nation's highways should connect with the center of large cities, should include beltways around large urban areas and should bypass small towns.

Further attempts to develop a national highway system were interrupted by World War II. But as the Allies gained the upper hand in the war, Congress started to turn its attention to post-war challenges, including consideration of a modern highway system to support the nation's growing economy and improve safety and mobility. The Federal-Aid Highway Act of 1944 authorized the BPR to designate a system of approximately 40,000 miles of Interstate highways, which proved very similar to the routes approved ultimately as the national Interstate system. But the 1944 highway bill did not specify any additional funds for construction of the highways, other than the small amount of funds currently made available by the federal government for highway construction.

The 1944 Highway Act had identified the need for a national system of interconnected highways, but had left out a key piece of the puzzle – how to fund a uniformly-designed national highway system, which would have significant differences in construction costs and traffic volume, depending on location. Even without significant federal funding available, cities and states began to move forward on their own, with some additional highway networks being built or planned in current Interstate corridors under various financing mechanisms. These early highway projects included toll highways such as the Pennsylvania Turnpike and the New York Thruway and early urban highways including the Los Angeles Freeway System and the Detroit Expressway System.

But for most motorists and businesses, the inadequate roadway system of the late 1940s and early 1950s contributed to growing human and economic losses, as cars and trucks jostled for position on the nation's inadequate, narrow and winding roads and streets.

In 1954 President Eisenhower appointed a committee to draft a proposal to fund a national system of Interstate Highways. Eisenhower noted that the nation's obsolete highway system penalized Americans through increased traffic deaths, the waste of time caused by traffic delays, the increased cost of freight movement and the inability of the nation's highways to meet the mobility demands that would be caused by a regional catastrophe or national defense emergency.

The initial plan prepared for President Eisenhower called for funding a national Interstate Highway System through bond financing, but Congress dismissed the use of bond revenue as the primary source of Interstate financing. In 1956, Congress overwhelmingly approved the construction of a national Interstate Highway System when the financing was changed to a pay-as-you-go format that would collect a series of user fees -- most notably a 3 cent-per-gallon tax on motor fuel -- into a national Highway Trust Fund.

The Federal-Aid Highway Act of 1956 called for the construction of a 41,000-mile Interstate Highway System, which was to be completed by 1970 at a cost of approximately \$27 billion. The design of the system was very similar to the initial 1944 plan, which called for connecting large urban areas, including routing highways into central cities, largely at the request of mayors and other local politicians who feared that their communities would be left behind without modern highway access. The Interstate system was designated to incorporate approximately 2,000 miles of existing highways, including the Pennsylvania Turnpike and the New York Thruway. The highways were to be built to high design standards that would reduce traffic deaths and increase the amount and speed of traffic that could be carried. These design standards included full access

control to limit entrance and exit to on and off ramps, a minimum of four lanes, medians to separate oncoming lanes and moderate curves.

The Construction of the Interstate System in Wisconsin

Following the signing of the Federal-Aid Highway Act of 1956 by President Eisenhower on June 29, 1956, Wisconsin moved quickly to orient its highway program toward the enormous task of planning and constructing the state's eventual 743-mile Interstate system. The first Interstate construction project started in Wisconsin was a segment of Interstate 94 in Waukesha County, started in 1956.¹ The first section of Interstate highway in the state opened to traffic was a one-mile portion of Interstate 94 near Johnson Creek in Jefferson County, which opened in 1956.²

In the Milwaukee area, by 1955 the region had completed an initial plan for a 68-mile freeway system. The first urban Interstate portion completed in Milwaukee was a portion of Interstate 94 from 13th Street to 68th Street, which was opened to traffic in 1962.³ The state also completed the construction of U.S. 141 from Lexington to Brown Deer in the Milwaukee area in 1957. This route was eventually upgraded to a highway starting in 1962 and became part of Interstate 43, extending north from Milwaukee to Ozaukee County.⁴

The development of Wisconsin's Interstate system was in two stages. The initial stage, completed by the 1980s, was the construction of the Interstate highways designated by the 1956 Interstate act, including Interstates 43, 90, 94, 535, 794 and 894.

Following the completion of Wisconsin's designated Interstate highway system, the state focused on upgrading other critical highways in the state to Interstate standards so that they could be designated as Interstate highways. Wisconsin highways that have been upgraded to Interstate standards and subsequently designated as Interstate highways include State Highway 15, which became I-43 from Beloit to Milwaukee and U.S. 51 from Portage to Wausau, which became a portion of Interstate 39, which was opened in the 1990s.⁵

Trends in Interstate Travel and Capacity

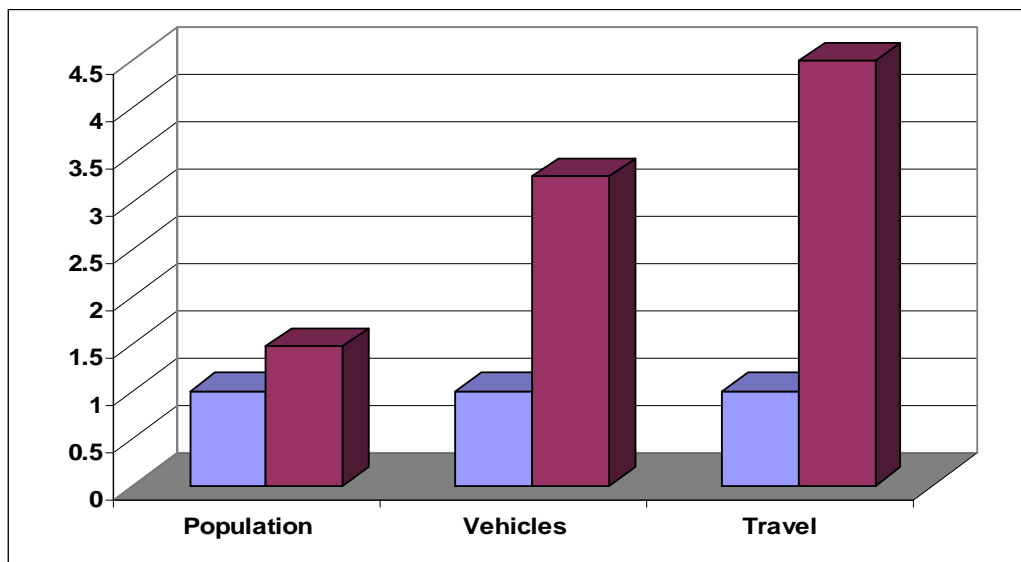
Wisconsin is served by four Interstate routes (excluding three-digit urban sections), totaling 743 miles. These Interstates include Interstate 39, which runs through the center of the state from the Illinois border north to Merrill; Interstate 43, which runs from the south central portion of the state, east to Milwaukee and then north to Green Bay; Interstate 90, which runs east-west in the lower central part of the state; and Interstate 94, which runs from the Southeast corner of the state, through the Milwaukee area and then Northwest, through the Eau Claire region to the Minnesota border.

The majority of the state's Interstate system was completed by 1986. By 1986, 78 percent (2,521 of 3219) of lane miles of the state's Interstate system were open to traffic.⁶ Lane miles are the total number of lanes multiplied by the length. Thus a 10-mile segment of four-lane highway equals 10 center-lane miles and 40 lane miles.

Since the beginning of the Interstate Era 50 years ago, Wisconsin has seen enormous increases in population, the number of motor vehicles and the amount of

vehicle travel. From 1956 to 2004 (the latest year for which data is available), the state's population has increased by 47 percent from approximately 3.7 million to 5.5 million, the number of motor vehicles increased by 227 percent from approximately 1.4 million to 4.7 million and vehicle travel in Wisconsin has increased by 349 percent from approximately 13 billion miles driven annually to 60 billion miles.⁷

Chart 1. Increase since 1956 in Population, Vehicles and Travel in Wisconsin (1 = 1956 level)



Source: TRIP analysis of U.S. Census and Federal Highway Administration data

Traffic Congestion on Wisconsin's Interstates

The Interstate Highway System was initially designed largely to provide transportation between the nation's urban areas and to support national defense. But as Interstate highways were ultimately built around and through many cities, they became the nation's most critical transportation corridors both between and within urban areas.

Today, the Interstate Highway System remains the most critical component of Wisconsin's transportation system. While Interstate highways account for only one

percent of all lane miles of roads in the state, they carry 18 percent of all travel in the state.⁸

Travel on Wisconsin's Interstate highways continues to grow at a significant rate. In fact, the average annual amount of travel per Interstate lane-mile in Wisconsin increased by 41 percent from 1990 to 2004, from an average of approximately 2.3 million miles traveled annually per Interstate lane-mile to approximately 3.3 million miles traveled annually per Interstate lane-mile.⁹

This increase in traffic on Wisconsin's Interstate highways has resulted in a significant increase in traffic congestion levels. Approximately one-third – 32 percent - of Wisconsin's urban Interstates are considered congested because they carry traffic levels that result in significant delays during peak travel hours.¹⁰ Traffic congestion has also spread to some rural stretches of Wisconsin's Interstate system as travel between urban areas in the state continues to increase. Currently, six percent of Wisconsin's rural Interstate miles are considered congested because of high volumes of travel.¹¹ The Federal Highway Administration considers any Interstate highway that carries more than 80 percent of its design capacity to be congested, because at this level of traffic, vehicles experience significant delays in traffic flow. When Interstate traffic reaches 95 percent of the highways' design capacity the route is rated as being severely congested, because vehicles are likely to experience stop and go traffic and any incident can be expected to cause a serious breakdown of traffic flow.

Freight Shipment by Large Trucks on Wisconsin's Interstate Highways

Every year, \$217 billion in goods are shipped from sites in Wisconsin and another \$183 billion in goods are shipped to sites in Wisconsin, mostly by trucks.¹² In fact, 79 percent of the goods shipped annually from sites in Wisconsin are carried by trucks and another 10 percent are carried by courier services, which use trucks for part of their deliveries.¹³ Similarly, 80 percent of the goods shipped to sites in Wisconsin are carried by trucks and another 10 percent are carried by courier services, which use trucks for part of their deliveries.¹⁴

Wisconsin's Interstate Highway System is the most critical set of highways for goods shipment. Nationally, Interstate highways account for 50 percent of travel by large trucks.¹⁵ In Wisconsin, 41 percent of all large commercial truck travel occurs on the state's Interstate highways. In 2004, travel by large commercial trucks accounted for 18 percent of all miles traveled on Wisconsin's Interstate system.¹⁶

Traffic Safety on Wisconsin's Interstate Highways

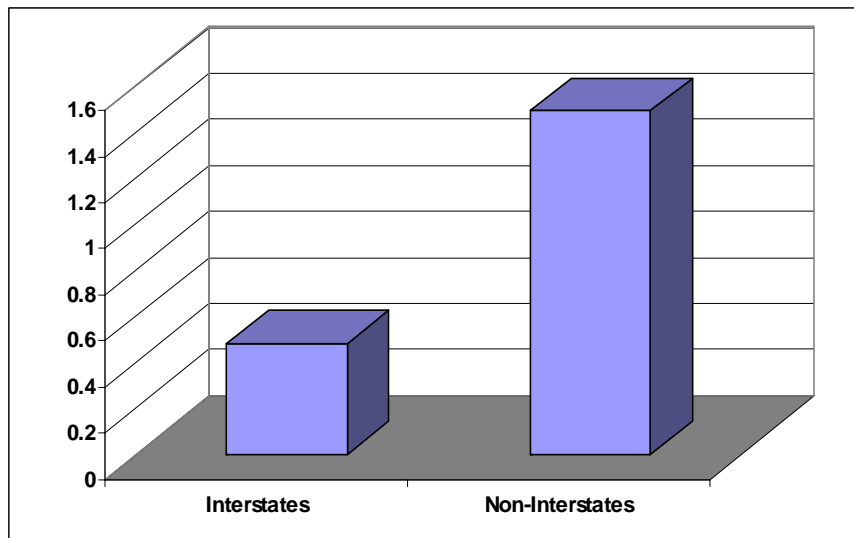
Perhaps the most significant benefit of the Interstate system is that it has greatly improved traffic safety in Wisconsin and throughout the U.S. by providing travelers with a network of highways with a variety of safety designs that greatly reduce the likelihood of serious accidents.

The safety features that are required on Interstates include a separation from other roads, streets and rail lines, access limited to on and off ramps, a minimum of four-lanes to prevent the need to enter oncoming lanes for passing, and gentler curves. Most

Interstate highways also have paved shoulders, and many have median barriers to avoid cross-over accidents and rumble strips to warn drivers if they are leaving the roadway.

The result of the high level of safety design standards on the Interstate is that travel on Wisconsin's Interstate highways is approximately three times safer than travel on all other roads and highways in the state. The traffic fatality rate per 100 million vehicle miles of travel on Wisconsin's Interstate highways was 0.48 in 2004, the latest year for which data is available. The fatality rate per 100 million vehicle miles of travel in 2004 on Wisconsin's non-Interstate routes was 1.49 – approximately triple the rate on the state's Interstates.

Chart 2. Fatality rate per 100 Million Vehicle Miles of Travel for Wisconsin's Interstate and Non-Interstate roadways, 2004



Source: TRIP analysis of FHWA data

Wisconsin's Interstate Highway System, which carried 18 percent of the state's travel in 2004, accounted for only six percent of the state's fatalities as a result of its superior traffic safety features. There were 51 traffic fatalities on Wisconsin's Interstate highways in 2004 – six percent of the 792 traffic fatalities, which occurred in Wisconsin in 2004.¹⁷

Pavement Conditions of Wisconsin's Interstate System

The lifecycle of highway pavements is greatly affected by a transportation agency's ability to perform timely maintenance and upgrades to ensure that surfaces remain smooth for as long as possible. The pavement condition of a state's major roads are evaluated and classified as being in poor, mediocre, fair or 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.¹⁸

In 2004 (the latest year for which data is available), three percent of pavements on Wisconsin's Interstate highways were rated in poor condition and 14 percent were rated in mediocre condition.¹⁹ Roads rated in mediocre condition 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. In Wisconsin, 27 percent of Interstate pavements are rated in fair condition and the remaining 56 percent of Interstate pavements are rated in good condition.²⁰

Pavement deterioration 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.²¹

Bridge Conditions of Wisconsin's Interstate Highways

Of the 1,130 bridges on Wisconsin's Interstate highways, eight percent are rated as structurally deficient and nine percent are rated as functionally obsolete.²²

Bridges that are rated structurally deficient show significant signs of deterioration as a result of use and exposure. The FHWA defines a structurally deficient bridge as one that requires immediate rehabilitation to remain open, is restricted to carrying lighter-weight vehicles or is closed. Bridges that are rated as functionally obsolete do not meet current design standards, which may result in reduced traffic safety, compared to a bridge meeting current standards. Functionally obsolete bridges are defined by the FHWA as those that have deck geometry, load carrying capacity, clearance or approach roadway alignment that no longer meet the criteria for the system of which the bridge is a part.

While most of the state's Interstate bridges are generally in acceptable condition, a large number of these bridges are reaching an age when they will soon require significant repairs and in some cases replacement. The average lifespan of an older bridge is 50 years.²³ Older bridges often need significant repairs or rehabilitation or may need to be replaced to continue to provide adequate service. The average age of Wisconsin's Interstate bridges is 37 years.²⁴

Benefits of Wisconsin's Interstate System

The construction of Wisconsin's Interstate Highway System has had a profound impact on the state's development, impacting the quality of life of the state's residents

and visitors in numerous ways including improved safety, expanded lifestyle choices, improved business productivity and an enhanced economic standard of living.

By greatly increasing the number of areas that are within a reasonable driving distance, the Interstate system has greatly increased people's access to jobs, housing, recreation, healthcare, shopping and other amenities.

Similarly, the construction of the Interstate system has benefited the nation's economy by reducing the costs of and increasing the speed of goods movement. The ability to cheaply and quickly ship products to or from Wisconsin and many U.S. and international sites has provided lower costs and greater selection to consumers and has opened up new markets to Wisconsin businesses. The completion of the vast majority of the Interstate system by the 1980s and the deregulation of the U.S. trucking industry resulted in a significant improvement in the competitiveness of U.S. business. In fact, the cost of moving freight, as measured by U.S. business logistics costs, dropped from 16 percent of U.S. Gross Domestic Product (GDP) in 1980 to nine percent in 2002.²⁵

The initial construction of much of the Interstate system provided a tremendous boost to business productivity as a result of more efficient goods shipment. In fact, economists have estimated that through the initial phase of Interstate construction to 1970, the rate of return for every dollar of public investment in highway construction was 54 cents, which meant that investments recovered their costs in two years.

The continued tremendous increase in freight deliveries over recent years has been partly fueled by improved communications and the need for greater economic competitiveness. Improved communications provided by the Internet are integrating producers, wholesalers, retailers and consumers. Businesses have responded to improved

communications and the necessity to cut costs with a variety of innovations, including just-in-time delivery, increases in small package delivery, demand-side inventory management and accepting customer orders through the Internet.

The result of these changes has been a significant improvement in logistics efficiency as firms move away 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.²⁶

Interstate Benefits for Individuals in Wisconsin

TRIP has calculated the annual financial benefit per person and statewide in Wisconsin, based on the value of improved traffic safety, reduced travel time, reduced fuel use and reduced consumer costs.

Safety:

By carrying significant volumes of traffic on roadways with higher safety standards and lower traffic fatality rates, the Interstate saves numerous lives annually. In fact, TRIP estimates that Interstate highways in Wisconsin have saved an average of 100 lives per year over the last 10 years.²⁷ Since 1956, TRIP estimates that Interstate highways have saved approximately 3,000 lives in Wisconsin.²⁸ This estimate is based on a comparison of the annual fatality rate on Wisconsin's Interstate highways compared to the fatality rate each year on other major roads in the state. Interstate safety benefits were estimated by calculating the additional fatalities that would have occurred in each year if the travel that occurred on Wisconsin's Interstate highways had instead been

carried by other major roads in the state, many of which often lack many of the safety features found on Interstate highways and have a significantly higher traffic fatality rate.

TRIP estimates that the improved highway safety provided by Wisconsin's Interstates saves the state \$380 million annually in reduced economic costs as a result of the reduction in fatal or serious traffic accidents, saving \$69 per person annually.²⁹

TRIP's estimate is based on research by the National Highway Traffic Safety Administration (NHTSA), which annually estimates the economic costs of fatal and serious traffic accidents in the U.S. The NHTSA estimates are strictly of the economic consequences of serious and fatal traffic crashes, such as lost productivity and increased healthcare costs.

Time and motor fuel:

Because it features limited access, no stoplights and often more direct routes between major urban areas, the Interstate system has saved travelers time by reducing travel times and making travel more efficient. By reducing travel times, the Interstate Highway System has saved motorists time and has also increased the choices people have of where to live, work, shop and travel for recreation.

TRIP has estimated the additional time that Wisconsin residents would spend traveling if the state did not have its network of Interstate highways. These estimates are based on assuming that if there were no Interstate highways in Wisconsin that this traffic would be carried by other major roads in the state, such as other urban freeways and urban and rural arterial roads and highways. Shifting the state's Interstate traffic onto other routes would increase traffic congestion on these other routes and also slow travel

times, by shifting travel from faster-moving Interstate highways onto slower-moving roads and highways. TRIP applied traffic speed calculations developed by the Texas Transportation Institute, which annually estimates traffic congestion levels throughout the U.S., to estimate the traffic speeds that would result on other major roads in the state if they had to carry the traffic in Wisconsin currently being carried by the state's Interstate system.

TRIP found that without Interstate highways, Wisconsin residents would spend an additional 123 million hours annually traveling in vehicles, or 22 hours per person annually.³⁰ TRIP also found that without Interstate highways, Wisconsin motorists would use an additional 59 million gallons of motor fuel annually.³¹ The total value of the time³² and motor fuel that is saved annually in Wisconsin by the Interstate Highway System is \$357 per person (\$331 in time and \$26 in fuel).³³

Reduced Consumer Costs:

The Interstate system has had a significant impact on consumer costs by reducing the time it takes to complete trips, thereby reducing the cost of transporting goods. It has also reduced costs by increasing access between locations, which has increased access to cheaper land and increased consumer choices for everything from housing and jobs to recreation and shopping.

To calculate the economic impact of the Interstate Highway System on individual consumers in Wisconsin, TRIP has gathered data on average consumer expenditures in the state and has estimated the impact of the Interstate Highway System on these costs.

Based on data from the U.S. Department of Labor and the Bureau of Economic Analysis, TRIP has calculated the average expenditure per capita in each state on Apparel, food, housing and transportation.³⁴ TRIP then surveyed the nation's leading transportation economists for their estimates of the percentage reduction in consumer expenditures, as a result of the Interstate system, for Apparel, food, housing and transportation. TRIP used the average estimated impact in each category to calculate the average amount saved by Wisconsin consumers annually in each category.

Apparel and food costs are impacted by reduced logistics costs. Transportation costs, which include the cost of a vehicle, vehicle repairs and maintenance, and the cost of fuel, are similarly impacted by reduced logistics costs. The impact of the Interstate system on housing costs includes its impact on the cost of materials that are used in constructing homes as well as the impact that the Interstate system has had on lowering land prices by increasing consumer access to cheaper land, thus lowering housing costs.

TRIP estimates that the average Wisconsin resident saves \$1,355 per year as a result of the Interstate Highway System. The following chart indicates the annual saving per Wisconsin resident for Apparel, food, housing and transportation costs as a result of the Interstate Highway System. The total annual statewide savings in Wisconsin in reduced consumer costs as a result of the Interstate Highway System is estimated to be \$7.5 billion.

Chart 3. Annual, per person savings in Wisconsin, as a result of the Interstate Highway System.

	ANNUAL SAVINGS
Apparel	\$48
Food	\$171
Housing	\$689
Transportation	\$448
Total	\$1,355

Source: TRIP

The Interstate Highway System provides tremendous benefits every year to the people of Wisconsin. The total annual benefit per person in Wisconsin of the Interstate system is \$1,761 as a result of saved lives, time fuel and consumer expenses. The total statewide benefit in Wisconsin of the Interstate Highway System is \$9.7 billion. The following chart shows the combined annual benefit of the Interstate system per person and statewide in Wisconsin.

Chart 4. Total Annual Interstate Benefit Per Person and statewide in Wisconsin

	Per Person	Statewide (millions)
Safety	\$69	\$380
Time and Gas	\$357	\$1,882
Reduced Consumer Costs	\$1,335	\$7,466
Total	\$1,761	\$9,728

Source: TRIP

Meeting Wisconsin's Future Interstate Travel Needs

Wisconsin faces a significant challenge in maintaining and rebuilding its aging Interstate Highway System and providing adequate levels of access to meet growing travel demand. The Wisconsin Department of Transportation projects that travel on Wisconsin's Interstate highways is expected to increase by 31 percent by the year 2026, which will result in increased traffic congestion unless the state's Interstates are expanded.³⁵ The Wisconsin Department of Transportation also projects that large truck travel on the state's Interstate highways will increase by 65 percent by the year 2026, by which time large trucks will account for 24 percent of all Interstate vehicle travel in Wisconsin.³⁶

The Wisconsin Department of Transportation also reports that by the year 2016, 43 percent of the state's Interstate Highway System (318 of 743 miles) will be in need of significant rehabilitation or reconstruction to provide a smooth pavement surface.³⁷

The state has also begun to reconstruct Wisconsin's aging freeway system to modern design standards in the state's seven Southeastern counties, including the Milwaukee urban area. These improvements include adding distress lanes and eliminating left-hand entrance and exit ramps. The first major project, the reconstruction of the Marquette Interchange, is currently under construction. The Southeastern Wisconsin Regional Planning Commission reports that once the Marquette Interchange reconstruction is completed, the cost of the additional needed reconstruction of the area's freeways will cost \$5.9 billion. These recommended improvements include the widening of 127 miles of the region's 270-mile freeway system, which are mostly Interstates.³⁸

Growing traffic on Wisconsin's rural Interstates also threatens to impede economic development in the state, unless key segments are widened. An analysis of expected traffic increases on Wisconsin's rural Interstates indicate that approximately 160 miles of these routes will need to be widened from four to six-lanes by the year 2026. Segments of Wisconsin's rural Interstates that need to be widened include 94 from Eau Claire to the Minnesota border, Interstates 94/90 from Tomah to Portage, Interstate 90 from Madison to the Illinois border, and Interstate 94 from Madison to the Waukesha county line.

Wisconsin also continues to upgrade sections of state highways to Interstate standards so that they can gain Interstate designation. Wisconsin is currently making upgrades to State Highway 45/41 from the Zoo to Green Bay so that this route can eventually be designated as an Interstate highway.

Conclusion

Fifty years after construction of the Interstate Highway System began, Wisconsin and all of the U.S. continues to reap tremendous benefits from the nation's most critical transportation network. Wisconsin's Interstate system has saved approximately 3,000 lives since its inception in 1956 and in addition to saving lives, the Interstate continues to save Wisconsin residents \$9.7 billion annually in time, fuel and money by reducing the costs of goods that improve their quality of life, including the cost of apparel, food, housing and transportation. The state's Interstate highways also play a critical role in

supporting economic growth and increasing personal access to jobs, recreation, health care and housing, enhancing the lifestyle choices of the state's residents and visitors.

The safe, reliable and timely mobility provided by the state's Interstate highways has also improved the efficiency of Wisconsin's businesses and is integral to the functioning of the state's economy.

Prior to the approval of the Interstate system, President Eisenhower noted that inadequate highways resulted in lost time due to traffic delays, reduced economic productivity and reduced traffic safety.

Today, similar challenges are faced in Wisconsin, with growing traffic congestion, increasing car and truck travel and aging road surfaces and bridges that will soon need significant repairs and rehabilitation.

As Wisconsin's citizens look back on the many benefits that the Interstate Highway System has provided the state, they must also look ahead to meeting the challenge of providing a 21st Century Interstate Highway System that will continue to enhance the quality of life of today's and future residents of Wisconsin.

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Endnotes

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- ¹ Wisconsin Department of Transportation, 2006. Response to TRIP survey.
- ² Ibid.
- ³ Wisconsin Transportation Builder's Association, 2006. Interstate History Outline.
- ⁴ Ibid.
- ⁵ Ibid.
- ⁶ Wisconsin Department of Transportation, 2006. Response to TRIP survey.
- ⁷ U.S. Census Bureau data, Federal Highway Administration data. See charts MV-1 and VM-2. Additional historical data from Highway Statistics Summary to 1995.
- ⁸ TRIP analysis of Highway Statistics, 2004, Federal Highway Administration. Data is from charts VM-2 and HM-20.
- ⁹ Ibid.
- ¹⁰ Wisconsin Department of Transportation, 2005. Response to TRIP survey.
- ¹¹ Ibid.
- ¹² Bureau of Transportation Statistics, U.S. Department of Transportation. 2002 Commodity Flow Survey, State Summaries. State Table 13.
- ¹³ Ibid.
- ¹⁴ Ibid. State Table 15.
- ¹⁵ TRIP analysis of 2004 Federal Highway Administration data. 2004 Highway Statistics. Chart VM-1.
- ¹⁶ Wisconsin Department of Transportation response to TRIP survey. 2006.
- ¹⁷ Highway Statistics 2004, Federal Highway Administration. Charts FI-10, VM-2.
- ¹⁸ Ibid.
- ¹⁹ TRIP analysis of 2004 Federal Highway Administration data. See charts HM-63 and HM-64 in Highway Statistics 2004.
- ²⁰ Ibid.
- ²¹ Selecting a Preventative Maintenance Treatment for Flexible Pavements. R. Hicks, J. Moulthrop. Transportation Research Board. 1999. Figure 1.
- ²² Federal Highway Administration, 2005. National Bridge Inventory data.
- ²³ Commonwealth of Pennsylvania. 2005-06 Governor's Executive Budget.
- ²⁴ Wisconsin Department of Transportation response to TRIP survey, 2006.
- ²⁵ TRIP analysis of Federal Highway Administration data. See 2004 Federal Highway Statistics, charts HM-60 and VM-2.
- ²⁶ Ibid. P. 7.
- ²⁷ Estimate is based on TRIP's analysis of FHWA data for 1997 through 2004. TRIP estimated safety benefits for 2005 and 2006, based on travel and traffic safety data for the 2000 to 2004 period. TRIP assumed that in the absence of Interstate highways, travel would occur on other federal-aid highways. The number of lives saved was based on calculating fatalities for Interstate travel, if it had occurred on other federal-aid routes in Missouri.
- ²⁸ TRIP calculation is based on TRIP analysis of 1997 to 2004 data. Estimates of lives saved by the Interstate system from 1956 to 1996 are based on analysis by Wendell Cox and Jean Love in the 1996 publication "The Best Investment a Nation Ever Made."
- ²⁹ TRIP analysis of National Highway Traffic Safety Administration and Federal Highway Administration data.
- ³⁰ TRIP analysis of 2004 Federal Highway data, using speed factors from the 2005 Urban Mobility Report, which is published by the Texas Transportation Institute.
- ³¹ Ibid.
- ³² The value of time used for these estimates was \$14.85 per hour, based on the value used by the Texas Transportation Institute in their annual report on urban traffic congestion.
- ³³ The value of time is based on estimates by the Texas Transportation Institute.

³⁴ The U.S. Department of Labor estimates consumer costs per capita for U.S. regions. TRIP then calculated this data for each state by using state income per capita data to estimate cost differences between states.

³⁵ Wisconsin Department of Transportation response to TRIP survey.

³⁶ Ibid.

³⁷ Wisconsin Department of Transportation response to TRIP survey.

³⁸ Wisconsin Transportation Builders Association, 2006. An Analysis of Funding Needs on Wisconsin's State Highway System. P. 11.