

The Interstate Highway System in Michigan:

Saving Lives, Time and Money

*A report on the condition, impact, use and future needs of
Michigan'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, Michigan's Interstate highways have significantly improved the lives of the state's residents and visitors. In Michigan, 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, Michigan and the nation again face a challenge in modernizing the system of aging, increasingly congested Interstate highways. If Michigan 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 benefits, history and impact of Michigan's Interstate Highway System, its current use and condition and 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) and the U.S. Census Bureau . 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 Michigan's transportation system.

- Michigan's Interstate system, which includes two percent of all roadway lane miles in the state, carries 22 percent of all vehicle travel in the state.
- Since funding of the Interstate system was approved in 1956, vehicle miles of travel in Michigan has increased by 240 percent from approximately 30.4 billion miles driven annually to approximately 103.3 billion miles driven annually.
- The number of vehicles in Michigan has increased by 165 percent since 1956, and the state's population has jumped by 40 percent during that same time.

The state's Interstate Highway System saves the average Michigan resident \$2,728 per year in reduced safety costs, saved time, reduced motor fuel consumption and reduced apparel, food, housing and transportation costs. The total annual statewide savings is approximately \$27.6 billion.

- Improved traffic safety provided by the Interstate system saves the state \$747 million annually in reduced healthcare costs and costs associated with lost productivity - approximately \$74 per resident.
- By reducing travel times, the Interstate system saves each Michigan resident 82 hours of travel time annually - 827 million hours statewide.
- Michigan's Interstate system annually reduces statewide motor fuel consumption by 394 million gallons.
- Because it provides more efficient and direct routes, the Interstate system saves Michigan residents \$13.3 billion annually in the value of saved time and fuel - \$1,311 per person (\$1,214 in time and \$97 in fuel).
- 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. And increased access between locations has enabled access to cheaper land.
- TRIP estimates that consumer costs in Michigan for apparel, food, housing and transportation are reduced by \$13.6 billion annually, or \$1,343 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 economists.

Construction of the Interstate system in Michigan began in 1956 and was mostly completed by 1986. Michigan's portions of four Interstate routes, consisting of 1,243 miles of Interstate highways, run the length of the state and connect the state's major urban areas.

- The Federal-Aid Highway Act of 1956, signed into law by President Dwight Eisenhower on June 29, 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 in 1956 and is now 18.4 cents-per-gallon.

- Revenue collected from the 18.4 cents-per-gallon federal motor fuel tax and the 24.4 cents-per-gallon federal diesel fuel tax are the primary source of funding for the federal Highway Trust Fund, which distributes funds to state and local governments for highway and bridge repairs as well as other surface transportation improvements, including public transit, pedestrian and bicycling facilities.
- By 1986, 89 percent of the lane miles of Michigan's current Interstate system (5,366 of 5,998 miles) had been built, and 92 percent of the system's length in center-lane miles (1,138 of 1,243 miles) had been constructed.
- By 1996, 99.7 percent (1,239 of 1,243 miles) of the state's Interstate system had been constructed and 99 percent of the lane miles (5,944 of 5,998 miles) had been built.

Traffic congestion on Michigan's Interstate highways is increasing as travel growth significantly outpaces the addition of new lanes.

- More than one-third – 36 percent -- of Michigan's urban Interstates are considered congested because they carry traffic levels that result in significant delays during peak travel hours.
- Between 1990 and 2004, vehicle travel on Michigan's Interstates increased by 33 percent, while lane miles on the system only increased by three percent.
- Between 1990 and 2004, the average annual amount of travel per Interstate-lane-mile in Michigan increased by 30 percent.

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

- Michigan's Interstate highways have saved approximately 5,900 lives in Michigan since 1956. This estimate is based on assuming that if there were no Interstate highways, traffic would be carried by other major roads in the state, which have higher traffic fatality rates.
- Michigan's Interstate system has saved an average of 170 lives per year, based on the above criteria.

- Travel on Michigan'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 Michigan's Interstate system in 2004 was 0.41, while it was 1.32 on non-Interstate routes in 2004 in Michigan.
- The features that make Interstates safer than non-Interstate routes 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.

Michigan's Interstate highways and bridges have some deficiencies as a result of age and use, which need to be addressed through adequate funding in maintenance and repairs.

- Ten percent of Michigan's Interstate pavements are in poor condition and an additional 27 percent are in mediocre condition. Twenty-two percent are in fair condition and the remaining 41 percent are rated in good condition.
- Sixteen percent of Michigan's Interstate bridges are rated structurally deficient and 12 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 Interstate system is the backbone of the Michigan economy and has played a critical role in improving business productivity in the state.

- Every year, \$389 billion in goods are shipped annually from sites in Michigan and another \$407 billion in goods are shipped annually to sites in Michigan, mostly by truck.
- Seventy-eight percent of the goods shipped annually from sites in Michigan are carried by trucks and another seven percent are carried by courier services, which use trucks for part of the deliveries. Similarly, 83 percent of the goods shipped to sites in Michigan are carried by trucks and another nine 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.
- Michigan's Interstate highways have reduced travel times both within the state and to locations outside of Michigan. The improved mobility provided by the Interstate system has given Michigan's residents greater choices about where they live, work, shop and spend their leisure time.

Michigan faces a significant challenge in maintaining and rebuilding its aging Interstate Highway System and providing additional lane capacity to meet growing travel demand.

- Travel on Michigan's Interstate highways is expected to increase by 40 percent by the year 2026.
- Traffic congestion, which currently afflicts 36 percent of the state's urban Interstate highways, is expected to worsen substantially on Michigan's urban Interstate highways, unless additional lanes are added to these routes.
- By the year 2026, if additional capacity is not added to Michigan's Interstate system, 63 percent of Michigan's urban Interstates (398 of 631 miles) will be congested and 31 percent (188 of 613 miles) of Michigan's rural Interstates will be congested.

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 Highway 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.

Running the length of the state and connecting major urban areas, Michigan'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 Michigan residents and visitors to people and businesses within the state and throughout the nation.

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

In this report, TRIP looks at the benefits, history and impact of Michigan's Interstate Highway System, its current use and condition and 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, Michigan's political leaders now face the challenge of insuring that the safety and reliability of the state's

Interstate system are maintained by investing adequately in needed repairs and improvements to meet the needs 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 began looking at 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 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 identified the need for a national system of interconnected highways, but 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 system through bond financing, but Congress dismissed the use of bond revenue as the primary source of Interstate highway 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 Michigan

Following the signing of the Federal-Aid Highway Act of 1956 by President Eisenhower on June 29, 1956, Michigan moved quickly to orient its highway program toward the enormous task of planning and constructing the state's eventual 1,243-mile Interstate system

By 1986, 89 percent of the lane miles of Michigan's current Interstate system (5,366 of 5,998 miles) had been built, and 92 percent of the system's length in center-lane miles (1,138 of 1,243 miles) had been constructed.ⁱ By 1996, 99.7 percent (1,239 of 1,243 miles) of the state's Interstate system had been constructed and 99 percent of the lane miles (5,944 of 5,998 miles) had been built.ⁱⁱ

Center lane miles are the actual miles of Interstate routes and 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.

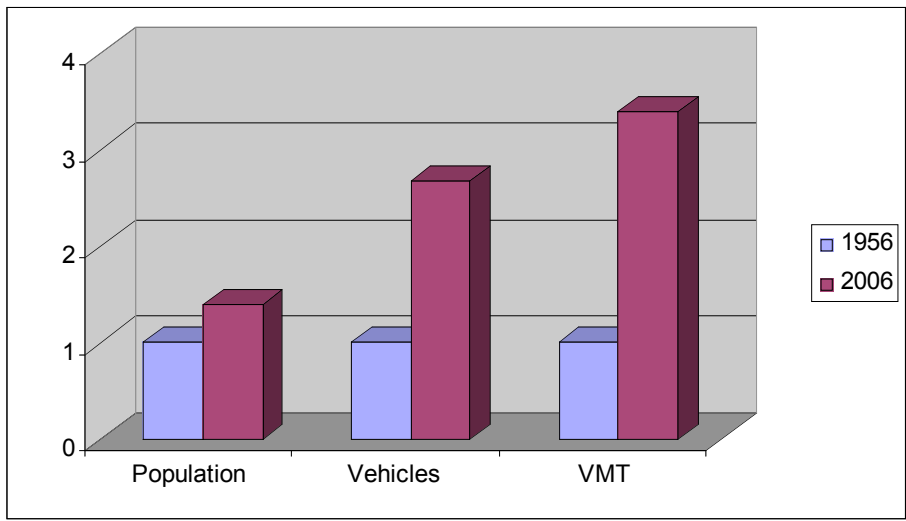
Trends in Interstate Travel and Capacity

Portions of four Interstate routes (excluding three-digit urban portions), consisting of 1,243 miles, serve the state of Michigan. These portions include I-75, which runs from Detroit, north through Flint and Saginaw and continues into the Upper Peninsula; I-69,

which enters at the south-central border of the state and travels through Lansing, Flint and on to Ontario; I-94, running from the southwest corner of the state, through Kalamazoo, Battle Creek, Jackson, Ann Arbor, into Detroit and on to the Michigan – Ontario border; and I-96, which begins near the eastern border of the state and travels through Grand Rapids and Lansing, terminating in Detroit.

Since the beginning of the Interstate era 50 years ago, Michigan 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 40 percent, from approximately 7.2 million residents to 10.1 million. During that same time, the number of motor vehicles increased by 165 percent, increasing from approximately 3.1 million vehicles to 8.4 million vehicles, and vehicle travel in Michigan has increased by 240 percent from approximately 30.4 billion miles driven annually to 103.3 billion miles driven annually.ⁱⁱⁱ

Chart 1. Increases since 1956 in Population, Vehicles and Travel in Michigan (1 = 1956 level)



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

Traffic Congestion on Michigan'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.

The Interstate Highway System remains the most critical component of Michigan's transportation system. While Interstate highways account for only two percent of all lane miles of roads in the state, they carry 22 percent of all travel in the state.^{iv}

Travel on Michigan's Interstate highways continues to grow at a significant rate, although there has been very little expansion of the system in recent years. From 1990 to 2004, vehicle travel on the state's Interstates increased by 33 percent from approximately 17 billion miles driven annually to approximately 22.7 billion miles driven annually.^v Yet, during the same time, total lanes miles on Michigan's Interstate system increased by only three percent, from 5,851 lane miles to 5,998 lane miles. As a result of this significant increase in travel on the state's Interstates, with a much smaller increase in Interstate lane mileage, these highways are now carrying significantly more traffic than in the past. In fact, the average annual amount of travel per Interstate lane mile in Michigan increased by 30 percent from 1990 to 2004.

This increase in traffic on Michigan's Interstate highways has resulted in a significant rise in traffic congestion levels. Thirty-six percent (228 of 631 miles) of Michigan's urban Interstates are considered congested because they carry traffic levels that result in significant delays during peak travel hours.^{vi} In addition, seven percent (43

of 613 lane miles) of Michigan's rural Interstates are considered congested. 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, drivers experience significant delays in traffic flow. When Interstate traffic reaches 95 percent of the highways' design capacity a route is rated as being severely congested, because drivers 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 Michigan's Interstate Highways

Every year, \$389 billion in goods are shipped from sites in Michigan and another \$407 billion in goods are shipped to sites in Michigan, mostly by trucks.^{vii} Seventy-eight percent of the goods shipped annually from sites in Michigan are carried by trucks and another seven percent are carried by courier services, which use trucks for part of their deliveries. Similarly, 83 percent of the goods shipped to sites in Michigan are carried by trucks and another nine percent are carried by courier services, which use trucks for part of their deliveries.^{viii}

Traffic Safety on Michigan's Interstate Highways

Perhaps the most significant benefit of the Interstate system is that it has greatly improved traffic safety in Michigan, 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 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 Michigan'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 Michigan's Interstate highways was 0.41 in 2004, the latest year for which data is available. The fatality rate per 100 million vehicle miles of travel in 2004 on Michigan's non-Interstate routes was 1.32.^{ix}

Pavement Conditions of Michigan 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 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.

In 2004 (the latest year for which data is available), ten percent of Michigan's Interstate pavements were rated in poor condition and an additional 27 percent were rated

in mediocre condition. Twenty-two percent were rated in fair condition and the remaining 41 percent were rated in good condition.^x Roads rated poor are badly cracked or broken. In some cases, poor roads can be resurfaced, but often are too deteriorated and must be reconstructed. 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.

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.^{xi}

Bridge Conditions of Michigan's Interstate Highways

Of the 1,196 bridges on Michigan's Interstate highways, 16 percent are rated as structurally deficient and 12 percent are rated as functionally obsolete.^{xii}

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.

Benefits of Michigan's Interstate System

The construction of Michigan'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 additional safety, expanded lifestyle choices 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 cost of and increasing the speed of goods movement. The ability to cheaply and quickly ship products to or from Michigan and many U.S. and international sites has provided lower costs and greater selection to consumers and has opened up new markets to Michigan 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.^{xiii}

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 through the initial phase of Interstate construction 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 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.^{xiv}

Interstate Benefits for Individuals in Michigan

TRIP has calculated the annual financial benefit per person and statewide in Michigan, 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.

TRIP estimates that Interstate highways in Michigan save an average of 170 lives per year.^{xv} Since 1956, TRIP estimates that Interstate highways have saved approximately 5,900 lives in Michigan.^{xvi} This estimate is based on a comparison of the annual fatality rate on Michigan'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 Michigan's Interstate highways had instead been carried by other major roads in the state, many of which often lack the safety features found on Interstate highways and have a significantly higher traffic fatality rate.

TRIP estimates that the improved highway safety provided by Michigan's Interstates saves the state \$747 million annually in reduced economic costs as a result of the reduction in fatal or serious traffic accidents, saving \$74 per person annually.^{xvii} 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 also increased the choices people have of where to live, work, shop and travel for recreation.

TRIP has estimated the additional time that Michigan 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 Michigan 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 Michigan currently being carried by the state's Interstate system.

TRIP found that without Interstate highways, Michigan residents would spend an additional 827 million hours annually traveling in vehicles, or 82 hours per person annually.^{xviii} TRIP also found that without Interstate highways, Michigan motorists would use an additional 394 million gallons of motor fuel annually.^{xix} The total value of the time and motor fuel that is saved annually in Michigan by the Interstate Highway System is \$13.3 billion - \$1,311 per person (\$1,214 in time and \$97 in fuel).^{xx}

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 Michigan, 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.^{xxi} 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 Michigan 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 Michigan resident saves \$1,343 per year in reduced consumer costs as a result of the Interstate Highway System. The following chart indicates the annual saving per Michigan resident for apparel, food, housing and transportation costs as a result of the Interstate Highway System. The total annual

statewide savings in Michigan in reduced consumer costs as a result of the Interstate Highway System is estimated to be \$13.6 billion.

Chart 2. Annual, per person savings in Michigan, as a result of the Interstate Highway System.

	ANNUAL SAVINGS
Apparel	\$50
Food	\$178
Housing	\$718
Transportation	\$397
TOTAL	\$1,343

Source: TRIP

The Interstate Highway System provides tremendous benefits every year to the people of Michigan. The total annual benefit per person in Michigan of the Interstate system is \$2,728 as a result of saved lives, time, fuel and consumer expenses. The total statewide benefit in Michigan of the Interstate Highway System is approximately \$27.6 billion. The following chart shows the combined annual benefit of the Interstate system per person and statewide in Michigan.

Chart 3. Total Annual Interstate Benefit Per Person and statewide in Michigan

	Per Person	Statewide (millions)
Safety	\$74	\$747
Time and Gas	\$1,311	\$13,261
Reduced Consumer Costs	\$1,343	\$13,579
TOTAL	\$2,728	\$27,587

Source: TRIP

Meeting Michigan's Future Interstate Travel Needs

Michigan faces a significant challenge in maintaining and rebuilding its aging Interstate Highway System and providing additional lane capacity to meet growing travel demand. Travel on Michigan's Interstate highways is expected to increase by 40 percent by the year 2026.^{xxii} Traffic congestion, which currently afflicts 36 percent of the state's urban Interstate highways, is expected to worsen substantially on Michigan's urban Interstate highways, unless additional lanes are added to these routes.

By the year 2026, if additional capacity is not added to Michigan's Interstate system, 63 percent of Michigan's urban Interstates (398 of 631 miles) will be congested and 31 percent (188 of 613 miles) of Michigan's rural Interstates will be congested.

Conclusion

Fifty years after construction of the Interstate Highway System began, Michigan, and all of the U.S., continue to reap tremendous benefits from the nation's most critical transportation network. Michigan's Interstate system has saved approximately 5,900 lives since its inception in 1956 and today it continues to save the state's residents time while playing a critical role in supporting economic growth and enhancing the lifestyle choices of Michigan's residents and visitors.

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

Prior to the approval to the funding 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 Michigan, with growing traffic congestion, increasing car and truck travel, and aging road surfaces and bridges that will soon need significant repair and rehabilitation.

As Michigan residents 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 their quality of life in the future.

Endnotes

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- ⁱ TRIP analysis of 1986 and 2004 Federal Highway Administration data.
- ⁱⁱ Ibid.
- ⁱⁱⁱ 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.
- ^{iv} TRIP analysis of Highway Statistics, 2004, Federal Highway Administration. Data is from charts VM-2 and HM-20.
- ^v TRIP analysis of 1990 and 2004 Federal Highway Administration data. See chart VM-2 in Highway Statistics 1990 and Highway Statistics 2004.
- ^{vi} Michigan Department of Transportation, 2005. Response to TRIP survey.
- ^{vii} Bureau of Transportation Statistics, U.S. Department of Transportation. 2002 Commodity Flow Survey, State Summaries.
- ^{viii} Ibid.
- ^{ix} TRIP analysis of 2004 Federal Highway Administration data, Highway Statistics.
- ^x TRIP analysis of 2004 Federal Highway Administration data. See charts HM-63 and HM-64 in Highway Statistics 2004.
- ^{xi} Selecting a Preventative Maintenance Treatment for Flexible Pavements. R. Hicks, J. Moulthrop. Transportation Research Board. 1999. Figure 1.
- ^{xii} TRIP analysis of 2004 Federal Highway Administration data, Highway Statistics.
- ^{xiii} TRIP analysis of Federal Highway Administration data. See 2004 Federal Highway Statistics, charts HM-60 and VM-2.
- ^{xiv} Ibid. P. 7.
- ^{xv} 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 Michigan.
- ^{xvi} 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."
- ^{xvii} TRIP analysis of National Highway Traffic Safety Administration and Federal Highway Administration data.
- ^{xviii} TRIP analysis of 2004 Federal Highway data, using speed factors from the 2005 Urban Mobility Report, which is published by the Texas Transportation Institute.
- ^{xix} Ibid.
- ^{xx} 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. The value used for fuel costs is \$2.50 per gallon.
- ^{xxi} 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.
- ^{xxii} TRIP estimated based on U.S. Census and Federal Highway Administration data.