

The Interstate Highway System in Kansas:

Saving Lives, Time and Money

*A report on the condition, impact, use and future needs of
Kansas' 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, Kansas' Interstate highways have significantly improved the lives of its residents and visitors. In Kansas, and throughout the nation, the Interstate system allows for high levels of mobility by greatly reducing travel times and provides 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, Kansas and the nation again face a challenge in modernizing the system of aging, increasingly congested Interstate highways. If Kansans 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 impact of Kansas' 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 Kansas Department of Transportation (KDOT). 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 Kansas' transportation system.

- Kansas' Interstate system, which includes one percent of all roadway lane miles in the state, carries 24 percent of all vehicle travel in the state.
- Since Interstate construction began in 1956, total vehicle miles of travel in Kansas nearly tripled, increasing by 197 percent. Since that time, the number of registered vehicles in the state has more than doubled, increasing by 118 percent, and the state's population has increased by 32 percent.

The state's Interstate Highway System saves the average Kansas resident \$1,885 per year in safety benefits, saved time, reduced motor fuel consumption and reduced apparel, food, housing and transportation costs. The total annual statewide savings is approximately \$5.2 billion.

- Improved traffic safety provided by the Interstate system saves the state \$329 million annually and the average state resident \$120 annually in reduced healthcare costs and costs associated with lost productivity due to traffic crashes.
- By reducing travel times, the Interstate system saves each Kansas resident 29 hours of travel time annually - 80 million hours statewide.
- The Interstate system saves Kansas residents \$1.3 billion annually in the value of saved time and fuel - \$468 per person (\$434 in saved time and \$35 in fuel).
- Kansas's Interstate system annually reduces statewide motor fuel consumption by 38 million gallons.
- 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 Kansas for apparel, food, housing and transportation are reduced by approximately \$3.5 billion annually, or \$1,297 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 Kansas started in 1956 and was completed in 1990, providing the state with 874 miles of Interstate highways, running the length of the state from Missouri to Colorado, reaching south to Oklahoma and connecting 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 user fees 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.

- 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, walking and bicycling facilities.
- The first section of Interstate built in Kansas under the provisions of the 1956 highway act was an eight-mile segment of U.S. Highway 40 near Topeka, which spanned from Valencia to Maple Hill road on a route that would become Interstate 70.
- On November 14, 1956, this section of Interstate 70 was open to traffic and was the first segment of the Interstate Highway System nationally to be opened under the provisions of the Federal Aid Highway Act of 1956. Kansas Governor Fred Hall cut the ribbon to officially open the route.
- Kansas chose to incorporate the Kansas Turnpike, then under construction in the mid-1950s, into the planned state segments of the Interstate Highway System.
- The Kansas Turnpike initially included 187 miles of highway. Today, it includes 238 miles of highway and is a critical part of the state's Interstate system.
- The state's Interstate system also includes 636 miles of non-tolled Interstates, resulting in a total of 874 miles of Interstate highways in Kansas.

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

- One-fourth – 25 percent – of Kansas' 186 miles of urban Interstate are considered congested because they carry traffic levels that result in significant delays during peak travel hours.
- From 1990 to 2004, vehicle travel on Kansas' Interstates increased by 53 percent, from 4.5 billion miles driven annually to 6.9 billion miles driven annually. But actual lane miles on the system only increased by one percent during that same period, from 3,635 total lane miles to 3,672 total lane miles.
- From 1990 to 2004, the average annual amount of travel per Interstate-lane-mile in Kansas increased by 51 percent.
- The ten most congested sections of Interstate highway in Kansas include segments in the Kansas City, Wichita and Topeka areas. The most congested

section is a portion of Interstate 35 in the Kansas City area from 67th Street to 75th Street. A full list of the congested sections can be found in the text of the report.

Kansas faces a significant challenge in rebuilding its aging Interstate highways system and providing additional lane capacity to meet growing travel demands. Traffic congestion is likely to get significantly worse in Kansas unless the state can fund needed congestion-relief projects.

- Travel on Kansas' Interstate highways is expected to increase by 55 percent by the year 2026.
- Currently, 25 percent of Kansas' urban Interstates are congested. If the state's urban Interstate highways are not widened, 59 percent of Kansas' urban Interstate highways will be congested during peak periods by the year 2016. By 2026, 72 percent of Kansas' urban Interstates will be congested during peak periods unless urban Interstate capacity is increased.
- Increasing urban traffic congestion may erode some of the logistics advantages that Kansas producers and distributors have over competitors as the cost and reliability of shipping goods is negatively affected.
- Four sections of the state's urban Interstate need to be widened from four to six-lanes over the next 10 years to accommodate growing traffic. The four sections, which total 19 miles, include portions of Interstates 235, 70 and 35 in the Kansas City and Wichita areas (details of the projects can be found in the report).
- The cost of these four needed widening projects is \$515 million. Funding is currently not available for these projects.
- Approximately 150 miles of Kansas' Interstate system will need to be significantly rehabilitated or reconstructed over the next 10 years.
- Approximately 220 bridges on Kansas' Interstate system will need either significant repair or reconstruction over the next 10 years.

The Interstate system is the backbone of Kansas's economy, supporting increases in business productivity.

- The Interstate system carries 40 percent of all large commercial truck travel in Kansas.
- Travel on Kansas' Interstate highways by large, commercial trucks is expected to increase by 90 percent by the year 2026.

- Travel by large commercial trucks accounted for 17 percent of all vehicle travel on the state's Interstate system in 2004. By the year 2026, large truck travel is expected to account for 22 percent of all travel on Kansas' Interstate highways.
- Every year, \$95 billion in goods are shipped annually from sites in Kansas and another \$87 billion in goods are shipped annually to sites in Kansas, mostly by truck.
- Seventy-three percent of the goods shipped annually from sites in Kansas are carried by trucks and another six percent are carried by courier services, which use trucks for part of the deliveries. Similarly, 78 percent of the goods shipped to sites in Kansas are carried by trucks and another 11 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.
- Kansas's Interstate highways have reduced travel times both within the state and to locations outside of Kansas. The improved mobility provided by the Interstate system has given Kansas residents greater choices about where they live, work, shop and spend their leisure time.

Kansas' Interstates provide a network of highways with a variety of safety designs that greatly reduce the likelihood of serious accidents. Travel on Kansas' Interstate highways is approximately twice as safe as travel on all other roadways in the state.

- Kansas' Interstate highways have saved approximately 2,600 lives in Kansas since 1956, based on an estimate of the number of traffic deaths that would have occurred if Kansas did not have Interstate highways. 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.
- Kansas' Interstate system has saved an average of 80 lives per year over the last 10 years, based on the above criteria.
- The features that make Interstates safer than other routes include: a separation from other roads and rail lines, a minimum of four-lanes, gentler curves and often paved shoulders, and median barriers and rumble strips to warn drivers when they are leaving the roadway.
- Travel on Kansas' Interstate highways is approximately twice as safe as travel on all other roadways. The fatality rate per 100 million vehicle miles of travel on Kansas' Interstate system in 2004 was 0.82, while it was 1.78 on non-Interstate routes in Kansas in 2004.
- There were 57 traffic fatalities on Kansas' Interstate highways in 2004. Only 12 percent of the 459 traffic fatalities that occurred in Kansas in 2004 were on the Interstate system, even though it carried 24 percent of all travel in the state in 2004.

Overall, current pavement and bridge conditions on the Kansas Interstate system are acceptable.

- Nine percent of Kansas' Interstate pavements are in mediocre condition. Another 17 percent of Interstate pavements are in fair condition and the remaining 74 percent are in good condition.
- Two percent of the state's Interstate bridges are rated structurally deficient and 21 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 Kansas' Interstate bridges is 37 years. Older bridges typically need significant repairs, reconstruction or replacement at approximately 50 years.

Some sections of Kansas' Interstate highways have several notable features or had a significant effect on travel patterns in the state. Some of these projects include:

- The 2.2 mile Canal Route on I-135 in Wichita, completed in 1979, was the most costly and technically challenging project on the Kansas Interstate system. This six-lane highway has four interchanges, a crossover bridge and four pedestrian bridges. The Canal Route, which carries an average of 85,500 vehicles a day, channels traffic through the core of Wichita and links with three other highway and freeway routes as well as I-35 and the I-235 bypass.
- Completed in 1999, the East Topeka Interchange project greatly enhanced the flow of traffic for motorists by improving the alignment in east Topeka on the Kansas Turnpike, I-70, K-4, and US-40. The project involved connecting K-4 to I-70 and the Kansas Turnpike, constructing two folded diamond interchanges, and building two new toll plaza facilities that have commuter parking areas and automated toll lanes.

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.

Running the length of the state from the Missouri border to the Colorado border and south to the Oklahoma border, and connecting the state's major urban areas, Kansas' Interstate Highway System is the most critical element of the state's transportation system. Fifty years after construction of the Interstate System first started, this network of highways has become the most important set of corridors linking Kansans to people and businesses within the state and throughout the nation.

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

In this report, TRIP looks at the history, benefits and impact of Kansas' 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 the nation's leaders made critical decisions on the future of the nation's highway system, today's political leaders now face the need to insure that the safety and reliability of the state's Interstate system are maintained by investing adequately in needed repairs and improvements to meet the challenges of the 21st Century.

Development of the U.S. Interstate System

In 1919, Lieutenant Dwight D. Eisenhower, who was born in Texas but raised in Kansas, 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 to look 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 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 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 Kansas

Following the signing of the Federal-Aid Highway Act of 1956 by President Eisenhower on June 29, 1956, Kansas moved quickly to orient its highway program toward the enormous task of planning and constructing the state's eventual 874-mile Interstate system. Immediately following the signing of the Federal-Aid Highway Act, Kansas gave approval to begin construction of an eight-mile segment on US. Highway 40, which runs from Valencia to Maple Hill Road on a route that would become Interstate 70.

Northeast Kansas residents had been pushing for construction of this segment since 1940, but the state did not initially commit to the project until 1954, when the federal government offered to pay for 60 percent of construction costs under its initial interstate funding formula. When the Interstate program approved by President Eisenhower increased the federal contribution to 90 percent, Kansas gave approval to start construction of the eight-mile segment. The project was completed in four months and became the first segment of the Interstate Highway System to be completed under the provisions of the Federal Aid Highway Act of 1956. On November 14, 1956 this section of Interstate 70 was opened. Kansas Governor Fred Hall cut the ribbon to officially open the route.¹

During the 1950s, Kansas had also started construction on the Kansas Turnpike, which stretches from Kansas City, west to Topeka and then drops southwest to Wichita before heading south to the Oklahoma border. When the Interstate program was approved in 1956, Kansas officials decided to not build a competing Interstate Highway System, but to instead incorporate the tolled Kansas Turnpike into the state's Interstate Highway

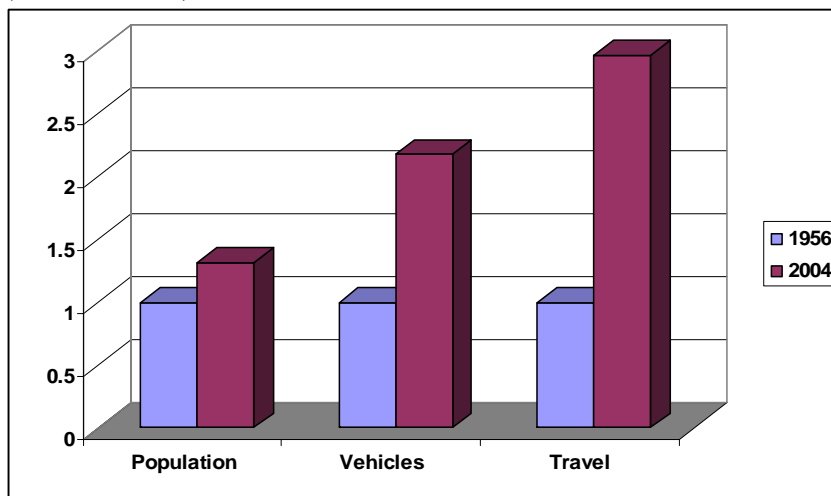
System. The Kansas Turnpike initially included 187 miles of highway and today includes 238 miles of highways. It remains a critical part of the state's 874-mile Interstate system.

The final segment of the state's Interstate system to be opened to traffic was a 1.8 mile segment of I-670 in the Kansas City area, which was opened in January 1990.

Interstate Travel and Capacity Trends

Since the beginning of the Interstate era 50 years ago, Kansas has seen enormous increases in population, the number of motor vehicles and the amount of vehicle travel. From 1956 to 2004 (the latest year that data is available), the state's population has increased by 32 percent, from approximately 2.1 million to 2.7 million. The number of motor vehicles increased by 118 percent from approximately 1.1 million to 2.3 million, and vehicle travel in Kansas has nearly tripled, increasing by 197 percent from 10 billion miles driven annually to 29 billion miles driven annually.²

Chart 1. Percentage change from 1956 to 2004 in Population, Vehicles and Travel in Kansas (1 = 1956 level)



Source: TRIP analysis of FHWA and U.S. Census Bureau data

Traffic Congestion on Kansas' 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 Kansas' transportation system. While Interstate highways account for only one percent of all lane miles of roads in the state, they carry 24 percent of all travel in the state.³

Travel on Kansas' 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 53 percent from 4.5 billion miles driven annually to 6.9 billion miles driven annually.⁴ Yet during the same 1990 to 2004 period, total lanes miles on Kansas' Interstate system increased by only one percent from 3,635 lane miles to 3,672 lane miles. The result of this significant increase in travel on the state's Interstate with very little increase in Interstate lane mileage is that 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 Kansas increased by 51 percent from 1990 to 2004.

This increase in traffic on Kansas' Interstate highways has resulted in a significant increase in traffic congestion levels. One-quarter – 25 percent – of Kansas' 186 miles of urban Interstates are considered congested because they carry traffic levels that result in significant delays during peak travel hours.⁵ 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 they are 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.

The most heavily congested sections of urban Interstates in Kansas were identified by comparing current traffic volumes with overall design capacity (volume/service ratio). The state's most congested section of Interstate highway is a six-lane section of I-35 from 67th Street to 75th Street in the Kansas City urban area, which carries 156,000 vehicles per day, 68 percent higher than it was designed to accommodate.⁶ The following chart indicates the Interstate highway segments in Kansas that experience the greatest levels of traffic congestion.

Chart 2: The Most Heavily Congested Sections of Urban Kansas Interstates

Route	Urban area	From	To	Daily Traffic	Lanes	Volume/Service
I-35	Kansas City	75th Street	67th Street	156,079	6	1.68
I-35	Kansas City	87th Street	75th Street	161,000	8	1.26
I-435	Kansas City	Nall Road	K-10	119,154	6	1.26
I-635	Kansas City	I-35	Merriam Drive	72,400	4	1.21
I-35	Kansas City	I-635	KS-MO Stateline	104,785	6	1.18
I-35	Kansas City	151st Street	87th Street	100,852	6	1.16
I-135	Wichita	K-96	K-254	73,372	4	1.13
I-35	Kansas City	67th Street	I-635	136,768	6	1.08
I-70	Topeka	Wanamaker	Gage	61,074	4	1.05
I-135	Wichita	US-54/Kellogg	1st Street	84,700	6	1.01
I-435	Kansas City	Mission Road	Nall Road	129,500	8	1.01

Source: Kansas Department of Transportation

Freight Shipment by Large Trucks on Kansas' Interstate Highways

Every year, \$95 billion in goods are shipped from sites in Kansas and another \$87 billion in goods are shipped to sites in Kansas, mostly by trucks.⁷ In fact, 73 percent of the

goods shipped annually from sites in Kansas are carried by trucks and another six percent are carried by courier services, which use trucks for part of their deliveries. Similarly, 78 percent of the goods shipped to sites in Kansas are carried by trucks and another 11 percent are carried by courier services, which use trucks for part of their deliveries.

The state's Interstate system is the most critical set of highways for goods shipment. In Kansas, 40 percent of all large commercial truck travel occurs on the states' Interstate highways. In 2004, travel by large commercial trucks accounted for 17 percent of all miles traveled on Kansas' Interstate system.

Traffic Safety on Kansas' Interstate Highways

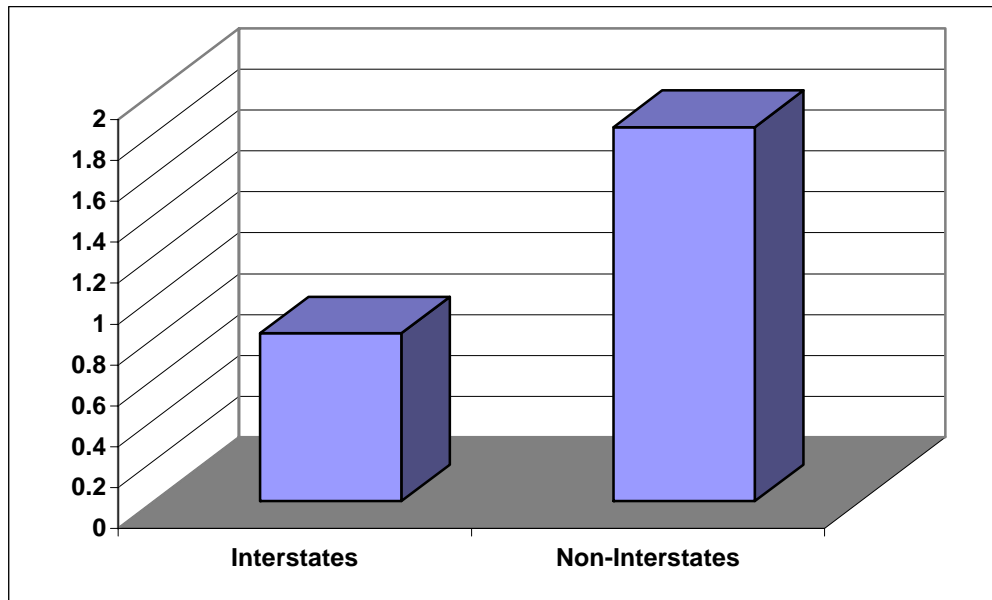
Perhaps the most significant benefit of the Interstate system is that it has greatly improved traffic safety in Kansas and throughout the U.S. by providing travelers with a network of highways with a variety of safety designs that greatly reduce the likelihood of serious accidents.

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 Kansas' Interstate highways is approximately twice as safe as travel on all other roads and highways in the state. The traffic fatality rate per 100 million vehicle miles of travel on Kansas' Interstate highways was .82, in 2004, the latest year for which data is available.

The fatality rate per 100 million vehicle miles of travel in 2004 on Kansas' non-Interstate routes was 1.78 – more than double the rate on the state's Interstates.

Chart 3. Fatality rate per 100 Million Vehicle Miles of Travel for Kansas' Interstate and Non-Interstate roadways, 2004



Source: TRIP analysis of FHWA data

Kansas' Interstate Highway System, which carried 24 percent of the state's travel in 2004, accounted for only 12 percent of the state's fatalities as a result of its superior traffic safety features. There were 57 traffic fatalities on Kansas' Interstate highways in 2004 – 12 percent of the 459 traffic fatalities, which occurred in Kansas in 2004.

Pavement Conditions of Kansas 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.⁸

In 2004 (the latest year for which data is available), Kansas' Interstate highways had nine percent of pavements rated in mediocre condition.⁹ 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 Kansas, 17 percent of Interstate pavements are rated in fair condition and the remaining 74 percent of Interstate pavements are rated in good condition.¹⁰

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.¹¹

Bridge Conditions of Kansas' Interstate Highways

Of the 926 bridges on Kansas' Interstate highways, two percent are rated as structurally deficient and 21 percent are rated as functionally obsolete.

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 the state's Interstate bridges are generally in good condition, a large number of these bridges are reaching an age when they will require significant repairs and in some cases replacement. The average lifespan of an older bridge is 50 years.¹² Older bridges often need significant repairs or rehabilitation or may need to be replaced to continue to provide adequate service. The average age of Kansas' Interstate bridges is 37 years.¹³

Unique Features of Kansas' Interstates

The construction of the U.S. Interstate system was the nation's largest public works project, spanning the nation with a system of highways able to carry large numbers of vehicles at highway speeds. Although the design concept was of a national system, the Interstate system is really a collection of numerous individual segments that presented states with a number of engineering and planning challenges. The following are a pair of Kansas Interstate projects that are of particular note both for the significant challenges they represented and the noteworthy benefits that the completion of these projects provided to motorists in the state:

Canal Route on I-135 – The Canal Route on I-135 in Wichita has been touted as one of the most significant Kansas Interstate projects of the 20th Century. When it was constructed during the 1970s, the 2.2-mile project was the most costly and technically challenging project on the Kansas Interstate System. Named for the drainage canal it straddles, work on the Canal Route started in 1971.

The project was completed in 1979 at a cost of \$32 million. This six-lane highway has four interchanges, a crossover bridge and four pedestrian bridges. Carrying an average of 85,500 vehicles per day, the Canal Route channels traffic through the heart of Wichita, which is the state's largest city. The Canal Route is vital to motorists in Wichita and south central Kansas as it links with three other highway and freeway routes as well as I-35 and the I-235 bypass.

East Topeka Interchange – In March 1999, the East Topeka Interchange project was the single biggest project the Kansas Department of Transportation let to construction at \$64.9 million. This project greatly enhanced the flow of traffic by improving the alignment in east Topeka on the Kansas Turnpike, I-70, K-4, and US-40. The project involved connecting K-4 to I-70 and the Kansas Turnpike, constructing two interchanges, and building two new toll plaza facilities that have commuter parking areas and automated toll lanes.

A total of 15 bridges were also constructed as part of the East Topeka interchange project. All the structures on the interchanges required a total of 2,800 tons of steel. The road design also included two roundabouts, which were the first ever on the state highway system in Kansas.

Benefits of Kansas's Interstate System

The construction of Kansas'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 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 costs of and increasing the speed of goods movement. The ability to cheaply and quickly ship products to or from Kansas and many U.S. and international sites has provided lower costs and greater selection to consumers and has opened up new markets to Kansas 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 2002.¹⁴

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 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.¹⁵

Interstate Benefits for Individuals in Kansas

TRIP has calculated the annual financial benefit per person and statewide in Kansas, 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 Kansas have saved an average of 80 lives per year over the last 10 years.¹⁶ Since 1956, TRIP estimates that Interstate highways have saved approximately 2,600 lives in Kansas.¹⁷ This estimate is based on a comparison of the annual fatality rate on Kansas'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 Kansas'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 Kansas's Interstates saves the state \$329 million annually in reduced economic costs as a result of the reduction in fatal or serious traffic accidents, saving \$120 per person annually.¹⁸ 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 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 Kansas 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 Kansas 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 Kansas currently being carried by the state's Interstate system.

TRIP found that without Interstate highways, Kansas residents would spend an additional 80 million hours annually traveling in vehicles, or 29 hours per person annually.¹⁹ TRIP also found that without Interstate highways, Kansas motorists would use an additional 38 million gallons of motor fuel annually.²⁰ The total value of the time and motor fuel that is saved annually in Kansas by the Interstate Highway System is \$468 per person (\$433 in time and \$35 in fuel).²¹

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 Kansas, 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.²² 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 Kansas 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 Kansas resident saves \$1,297 per year in reduced consumer costs as a result of the Interstate Highway System. The following chart indicates the annual saving per Kansas resident for apparel, food, housing and transportation costs as a result of the Interstate Highway System. The total annual statewide savings in Kansas in reduced consumer costs as a result of the Interstate Highway System is estimated to be \$3.5 billion.

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

	ANNUAL SAVINGS
Apparel	\$46
Food	\$165
Housing	\$664
Transportation	\$423
Total	\$1,297

Source: TRIP

The Interstate Highway System provides tremendous benefits every year to the people of Kansas. The total annual benefit per person in Kansas of the Interstate system is \$1,885 as a result of increased safety and reductions in the amount of time, fuel and consumer expenses.. The total statewide benefit in Kansas of the Interstate Highway System is \$5.2 billion. The following chart shows the combined annual benefit of the Interstate system per person and statewide in Kansas.

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

	Per Person	Statewide (millions)
Safety	\$120	\$329
Time and Fuel	\$468	\$1,281
Reduced Consumer Costs	\$1,297	\$3,548
Total	\$1,885	\$5,158

Source: TRIP

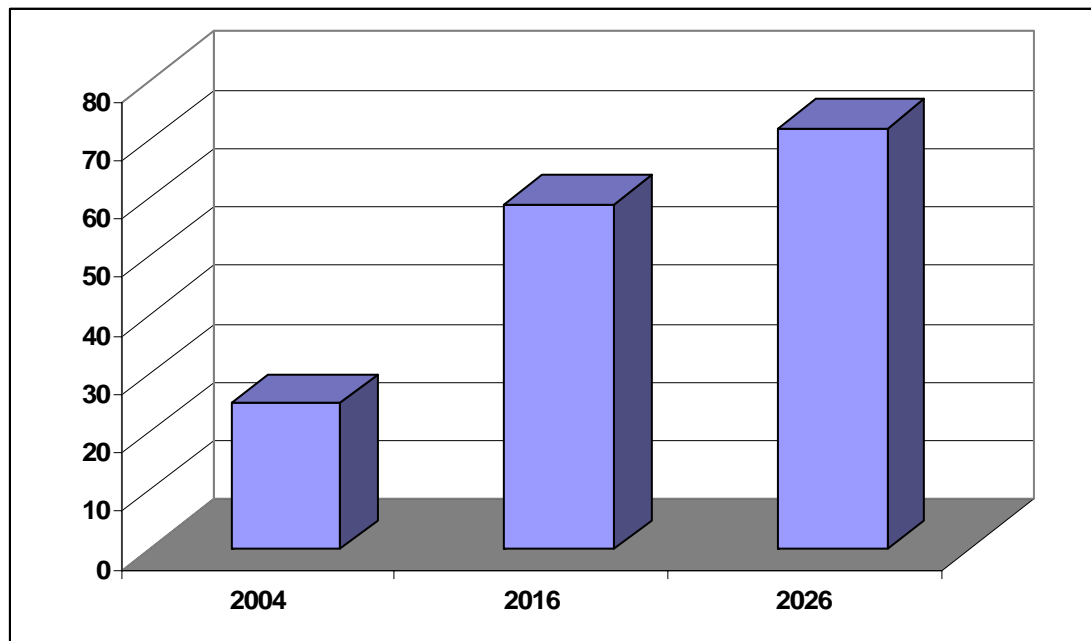
Meeting Kansas’ Future Interstate Travel Needs

Kansas 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 Kansas’ Interstate highways is expected to increase by 55 percent by the year 2026. Similarly, large truck travel is expected to increase rapidly on Kansas’ Interstate Highway System, increasing by 90 percent by the year 2026.²³ Large truck travel is expected to account for 22 percent of all Interstate travel in Kansas by the year 2026, compared to 17 percent in 2004.²⁴

Traffic congestion, which currently afflicts 25 percent of the state’s urban Interstate highways, is expected to worsen substantially on Kansas’ urban Interstate

highways, unless additional lanes are added to these routes. If by the year 2016, the state's urban Interstate highways are not widened, 59 percent will be congested during peak period; by 2026, the share of urban Interstates that are congested in Kansas will increase to 72 percent if additional lanes are not added to the state's Interstate system.²⁵

Chart 5. Percentage of Urban Kansas Interstates Which Are Currently Congested and Will Be Congested Unless Additional Lane Capacity is Added



Source: TRIP analysis of Kansas Department of Transportation data

The Kansas Department of Transportation has identified four sections of urban Interstates that need to be widened over the next 10 years to accommodate growing traffic. The four sections, which total 19 miles, are on Interstates 235, 70 and 35 and are in the Wichita, and Kansas City urban areas.²⁶ Completing these four projects, which would cost approximately \$515 million, would help relieve traffic congestion in these areas.²⁷ Currently, Kansas does not have funding available to proceed with these projects.

Chart 6: Interstate widening projects that are needed by 2016

Route	Urban Area	From	To	Length (miles)	Current lanes	Proposed lanes	Cost (Mil).
I-235/I-135/K-254	Wichita	Interchange		10	4	6	\$115
I-235/US-54/Central	Wichita	Interchange		4	4	6	\$200
I-70/K-7	Kansas City	Interchange		1	4	6	\$100
I-35	Kansas City	Olathe	Gardner	4	4	6	\$100

Source: Kansas Department of Transportation

Kansas also needs to start rebuilding many aging segments of highways and bridges on its Interstate system that are in need of significant reconstruction rather than routine maintenance or repaving. KDOT estimates that approximately 150 miles of the state’s 870-mile Interstate system and 220 of the state’s 926 Interstate bridges will need to be reconstructed or rebuilt over the next 10 years.²⁸ Sections of the state’s Interstate system that will need significant reconstruction over the next 10 years include sections of Interstates 435 and 35 in the Kansas City urban area and a section of Interstate 235 in the Wichita urban area.

Chart 7: Kansas Interstate sections in need of reconstruction by 2016

Route	County	From	To	Length (miles)
I-435	Johnson & Wyandotte	Missouri State Line	I-35	20
I-35	Johnson & Wyandotte	US-69	Olathe	15
I-235	Sedgwick	I-135/K-254	Turnpike	15

Source: Kansas Department of Transportation

Conclusion

Fifty years after construction of the Interstate Highway System began, Kansas and all of the U.S. continues to reap tremendous benefits from the nation’s most critical transportation network. Kansas’ Interstate system has saved approximately 2,600 lives since its inception in 1956 and today it continues to save Kansans time, and continues to

play a critical role in supporting economic growth and enhancing the lifestyle choices of Kansans.

The safe, reliable and timely mobility provided by the state's Interstate highways has improved the efficiency of Kansas' 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 Kansas, with growing traffic congestion, increasing car and truck travel and aging road surfaces and bridges that will soon need significant, repairs and rehabilitation.

As Kansans 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 in Kansas, both today and in the future.

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Endnotes

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- ¹ Kansas Department of Transportation, 2005. Response to TRIP survey.
- ² 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.
- ³ TRIP analysis of Highway Statistics, 2004, Federal Highway Administration. Data is from charts VM-2 and HM-20.
- ⁴ TRIP analysis of 1990 and 2004 Federal Highway Administration data. See chart VM-2 in Highway Statistics 1990 and Highway Statistics 2004.
- ⁵ Kansas Department of Transportation, 2005. Response to TRIP survey.
- ⁶ Ibid.
- ⁷ Bureau of Transportation Statistics, U.S. Department of Transportation. 2002 Commodity Flow Survey, State Summaries.
- ⁸ Ibid.
- ⁹ TRIP analysis of 2004 Federal Highway Administration data. See charts HM-63 and HM-64 in Highway Statistics 2004.
- ¹⁰ Ibid.
- ¹¹ Selecting a Preventative Maintenance Treatment for Flexible Pavements. R. Hicks, J. Moulthrop. Transportation Research Board. 1999. Figure 1.
- ¹² Commonwealth of Pennsylvania. 2005-06 Governor's Executive Budget.
- ¹³ TRIP analysis of Kansas Department of Transportation response to 2005 TRIP survey.
- ¹⁴ TRIP analysis of Federal Highway Administration data. See 2004 Federal Highway Statistics, charts HM-60 and VM-2.
- ¹⁵ Ibid. P. 7.
- ¹⁶ 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 Kansas.
- ¹⁷ 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."
- ¹⁸ TRIP analysis of National Highway Traffic Safety Administration and Federal Highway Administration data.
- ¹⁹ TRIP analysis of 2004 Federal Highway data, using speed factors from the 2005 Urban Mobility Report, which is published by the Texas Transportation Institute.
- ²⁰ Ibid.
- ²¹ 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 to calculate fuel costs is \$2.50 per gallon.
- ²² 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.
- ²³ Kansas Department of Transportation, 2005. Response to TRIP survey.
- ²⁴ TRIP analysis of Kansas Department of Transportation data supplied in response to 2005 TRIP survey.
- ²⁵ Kansas Department of Transportation, 2005. Response to TRIP survey.
- ²⁶ Ibid.
- ²⁷ Ibid.
- ²⁸ Ibid.