

# **The Interstate Highway System in West Virginia:**

## **Saving Lives, Time and Money**

*A report on the condition, impact, use and future needs of  
West Virginia'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 enhance the nation's economic productivity.

Serving as the most critical transportation link in the state's economy, West Virginia's Interstate highways have significantly improved the lives of the state's residents and visitors. In West Virginia, 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 20<sup>th</sup> Century transportation system, West Virginia and the nation again face a challenge in modernizing the system of aging, increasingly congested Interstate highways. If West Virginia 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 21<sup>st</sup> Century highway system.

In this report, TRIP looks at the history and impact of West Virginia's Interstate Highway System, its current use and condition and finally at the future needs of the state's most critical transportation system. Sources of data for this study include the U.S. Department of Transportation (USDOT), the Federal Highway Administration (FHWA), the National Highway Traffic Safety Administration (NHTSA), the U.S. Census Bureau and the West Virginia Department of Transportation (WVDOT). 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 West Virginia's transportation system.**

- West Virginia's Interstate system, which includes three percent of all roadway lane miles in the state, carries 28 percent of all vehicle travel in the state.
- Since Interstate construction began in 1956, total vehicle miles of travel in West Virginia have increased by 273 percent.
- The number of vehicles in the state has increased by 147 percent since 1956.

**The state's Interstate Highway System saves the average West Virginia resident \$2,032 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 \$3.7 billion.**

- Improved traffic safety provided by the Interstate system saves the state \$304 million annually and saves the average state resident \$167 annually in reduced healthcare costs and costs associated with lost productivity due to traffic crashes.
- By reducing travel times, the Interstate system saves each West Virginia resident 59 hours of travel time annually - 107 million hours statewide.
- Faster and more efficient routes provided by the Interstate system saves West Virginia residents \$1.7 billion annually in the value of saved time and fuel - \$947 per person (\$876 in time and \$71 in fuel).
- West Virginia's Interstate system annually reduces statewide motor fuel consumption by 51 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 West Virginia for apparel, food, housing and transportation are reduced by approximately \$1.7 billion annually, or \$918 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, according to a survey of leading transportation economists.

**West Virginia opened its first section of Interstate highway in 1961 and the most recent section was opened in 1988, providing the state with portions of six Interstate routes totaling, totaling 555 miles and connecting the state's largest urban areas and West Virginia with the rest of the nation.**

- 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 in 1956 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 segment of Interstate highway that was opened in West Virginia was an eight-mile portion of Interstate 81 in Berkeley County from south of Martinsburg to south of the US 11 interchange, which opened in June, 1961.
- The most recent section of West Virginia's Interstate highway system to open was a portion of Interstate 64 from Sam Black Church to Beckley, which opened in June, 1988.

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

- Eight percent of West Virginia's urban Interstates and 21 percent of the state's rural Interstates are considered congested because they carry traffic levels that result in significant delays during peak travel hours.
- Between 1990 and 2004, vehicle miles of travel on West Virginia's Interstates increased by 57 percent, while lanes on the system increased by only nine percent.
- From 1990 to 2004, the average annual amount of travel per Interstate-lane-mile in West Virginia increased by 44 percent.

**West Virginia faces a \$1.4 billion backlog over the next 20 years in funding needed repairs and improvements to the state's Interstate highways.**

- Travel on West Virginia's Interstate highways is expected to increase by 67 percent by the year 2026.
- According to the West Virginia Department of Transportation, by 2026, nearly two-thirds - 63 percent - of the state's Interstate highway system will be in need of significant rehabilitation or reconstruction to provide a smooth pavement surface (351 of 555 miles).
- Similarly, nearly half of the bridges on West Virginia's Interstate highway system – 46 percent – will need significant repairs or reconstruction by the year 2026 (300 of 654 bridges).

- The West Virginia Department of Transportation Department has also found that it will need to add additional lanes along 142 miles of its existing 555-mile Interstate system by the year 2026 in order to relieve growing traffic congestion.
- The total cost of needed repairs and expansion of West Virginia's Interstate highways over the next 20 years is \$2.7 billion: \$2.1 billion for repairs and \$600 million for expansion.
- The West Virginia Department of Transportation only has \$1.3 billion available for improvements to the state's Interstate highway system through 2026.

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

- West Virginia's Interstate highways have saved approximately 2,400 lives in the state since 1956, based on an estimate of the number of traffic deaths that would have occurred if West Virginia did not have Interstate highways.
- The number of lives saved by the Interstate was calculated by estimating the additional fatalities that would have occurred had Interstate traffic been carried by other major roadways in the state, which often have higher traffic fatality rates and may lack the safety features common to Interstate routes.
- The fatality rate on West Virginia's Interstate highways is approximately two-thirds (63 percent) the rate on all other roadways in the state. The fatality rate per 100 million vehicle miles of travel on West Virginia's Interstate system in 2004 was 1.42, while it was 2.26 in 2004 on non-Interstate routes in West Virginia.
- The features that increase interstate safety 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.

**Overall, current pavement conditions on the West Virginia Interstate system are acceptable, but a significant portion of West Virginia’s Interstate bridges are rated deficient.**

- One percent of West Virginia’s Interstate pavements are in poor condition and another nine percent are in mediocre condition. An additional nine percent of Interstate pavements in the state are in fair condition and the remaining 82 percent are in good condition.
- Seven percent of the state’s 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 average age of West Virginia’s Interstate bridges is 34 years. Older bridges typically need significant repairs, reconstruction or replacement at approximately 50 years.
- The 10 most-heavily traveled Interstate bridges that are structurally deficient are:

<b>County</b>	<b>Route Carried</b>	<b>Route or feature intersected</b>	<b>Average Daily Traffic</b>	<b>Year Built</b>	<b>Lanes</b>
Berkeley	I-81	US 11	26,500	1964	2
Ohio	I-70	Big Wheeling Creek	26,000	1965	3
Ohio	I-70	Wheeling Creek	25,000	1966	2
Kanawha	I-77	SLS 29	22,500	1967	2
Kanawha	I-77	SLS 29	22,500	1967	2
Cabell	I-64	Four Pole Creek & WV 10	21,750	1963	4
Cabell	I-64	Four Pole Creek & WV 10	21,750	1963	4
Ohio	I-70	Wheeling Creek	21,000	1966	2
Cabell	I-64	SLS 35	20,500	1962	2
Cabell	I-64	SLS 35	20,500	1962	2

- The complete list of the most structurally deficient heavily-traveled Interstate bridges in West Virginia is in the body of the report.

**The Interstate system is the backbone of the West Virginia economy, supporting increases in business productivity.**

- Travel by large commercial trucks accounts for 20 percent of all miles traveled on West Virginia's Interstate system.
- Every year, \$38 billion in goods are shipped annually from sites in West Virginia and another \$37 billion in goods are shipped annually to sites in West Virginia, mostly by truck.
- Seventy-four percent of the goods shipped annually from sites in West Virginia are carried by trucks and another nine percent are carried by courier services, which use trucks for part of the deliveries. Similarly, 79 percent of the goods shipped to sites in West Virginia are carried by trucks and another 10 percent are carried by courier services, which use trucks for part of their deliveries.
- The Interstate system has led to significant increases in economic productivity. Improvements in the highway system have allowed businesses to adopt more efficient logistics practices, which reduce costs for producers and consumers.
- The initial construction of much of the Interstate system provided a tremendous boost to business productivity as a result of more efficient goods shipment. Economists have estimated that from the initial phase of Interstate construction from 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. 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.
- West Virginia's Interstate highways have reduced travel times both within the state and to locations outside of West Virginia. The improved mobility provided by the Interstate system has given West Virginia's residents greater choices about where they live, work, shop and spend their leisure time.

## **Introduction**

The Dwight D. Eisenhower National System of Interstate and Defense Highways has been called the most ambitious public works project built since the age of the Roman Empire and is literally the backbone of America's economy. Initially conceived in 1939, significant construction of the Interstate system did not start until 1956 when Congress approved the financing of today's Interstate system, largely through collection of the federal motor fuel tax and other taxes on highway users.

With sections of six Interstates running the length of the state and connecting major urban areas, West Virginia's Interstate Highway System is the most critical element of the state's transportation system. Fifty years after construction of the Interstate system began, this network of highways has become the most important set of corridors linking West Virginians to people and businesses within the state and throughout the nation.

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

In this report, TRIP looks at the benefits, history and impact of West Virginia's Interstate Highway System, its current use and condition, and at the future needs of the state's most critical transportation system. Just as 50 years ago, when our leaders made critical decisions on the future of the nation's highway system, West Virginia'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 21<sup>st</sup> 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 West Virginia**

Following the signing of the Federal-Aid Highway Act of 1956 by President Eisenhower on June 29, 1956, West Virginia re-oriented its highway program toward the enormous task of planning and constructing the state's eventual 555-mile Interstate system. The first segment of Interstate highway that was opened in West Virginia was an eight-mile portion of Interstate 81 in Berkeley County from south of Martinsburg to south of the US 11 interchange, which opened in June of 1961.<sup>1</sup>

The most recent section of West Virginia's Interstate highway system to open was a portion of Interstate 64 from Sam Black Church to Beckley, which opened in June, 1988.<sup>2</sup>

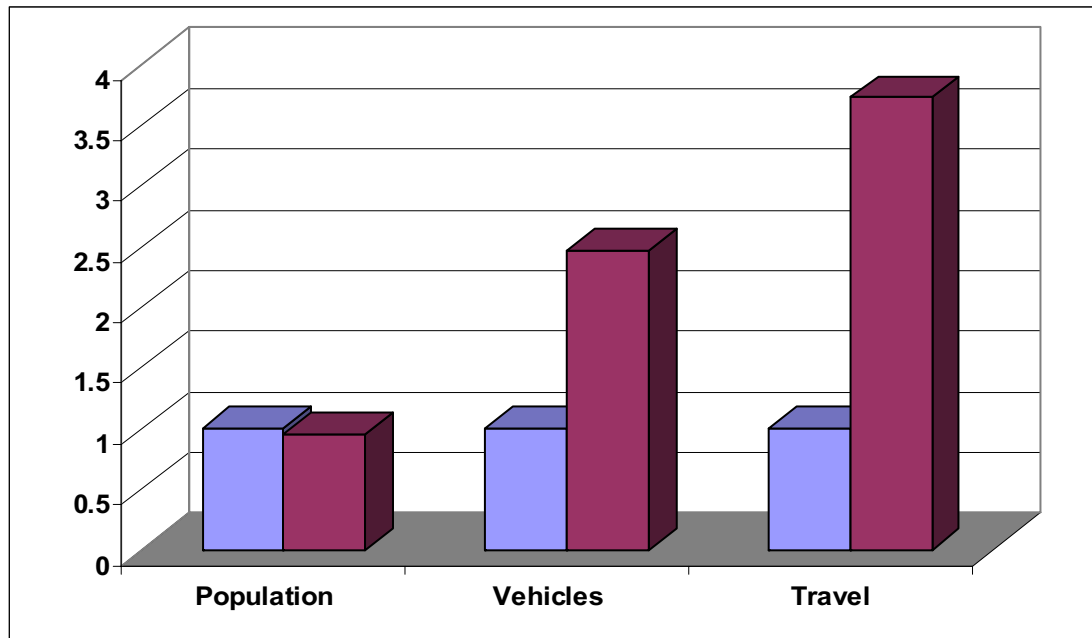
## **Trends in Interstate Travel and Capacity**

Sections of six Interstate routes serve West Virginia, consisting of 555 miles. These include Interstate 64, running from the state's Western border with Kentucky, through Charleston and then south through Beckley, before heading east to the Virginia border; Interstate 77, which runs south from the Ohio border near Parkersburg, through Charleston continuing onto the Virginia border; Interstate 79 which heads from Charleston, northeast to the Pennsylvania border; and small sections of Interstates 68, 70 and 81 in the Northern part of the state.

Since the beginning of the Interstate era 50 years ago, despite a modest decrease in population, West Virginia has experienced significant growth in 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 decreased by five percent from approximately 1.9 million to 1.8 million people.<sup>3</sup> During that same time, the number of motor vehicles increased by 147 percent from 565,000 motor vehicles to approximately 1.4 million.<sup>4</sup> Over the same time period, vehicle travel in West Virginia increased by 273 percent, from 5.4 billion miles driven annually to 20.3 billion miles driven annually.<sup>5</sup>

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



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

### **Traffic Congestion on West Virginia'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 West Virginia's transportation system. While Interstate highways account for only three percent of all lane miles of roads in the state, they carry 28 percent of all travel in the state.<sup>6</sup>

Travel on West Virginia's Interstate highways continues to grow at a significant rate, although there has been very little expansion of the system in recent years. Between 1990 and 2004, vehicle travel on the state's Interstates increased by 57 percent from 3.6 billion miles driven annually to 5.7 billion miles driven annually.<sup>7</sup> During the same time, lane miles on West Virginia's Interstate system increased by nine percent, from 2,109 lane miles to 2,302 lane miles.<sup>8</sup> The result of this significant increase in travel on the state's Interstates, with very little increase in Interstate lane mileage, is that these highways are now carrying significantly more traffic than in the past. The average annual amount of travel per Interstate lane mile in West Virginia increased by 44 percent from 1990 to 2004.<sup>9</sup>

This increase in traffic on West Virginia's Interstate highways has also resulted in an increase in traffic congestion levels in West Virginia. A total of eight percent of West Virginia's urban Interstates (14 of 171 miles) are considered congested.<sup>10</sup> A total of 21 percent of West Virginia's rural Interstate highways (91 of 438 miles) are considered congested.<sup>11</sup> 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, the 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 West Virginia's Interstate Highways**

Every year, \$38 billion in goods are shipped from sites in West Virginia and another \$37 billion in goods are shipped to sites in West Virginia, mostly by trucks.<sup>12</sup> In fact, 74 percent of the goods shipped annually from sites in West Virginia are carried by trucks and another nine percent are carried by courier services, which use trucks for part of their deliveries. Similarly, 79 percent of the goods shipped to sites in West Virginia are carried by trucks and another 10 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 2004, travel by large commercial trucks accounted for 20 percent of all miles traveled on West Virginia's Interstate system.<sup>13</sup>

### **Traffic Safety on West Virginia's Interstate Highways**

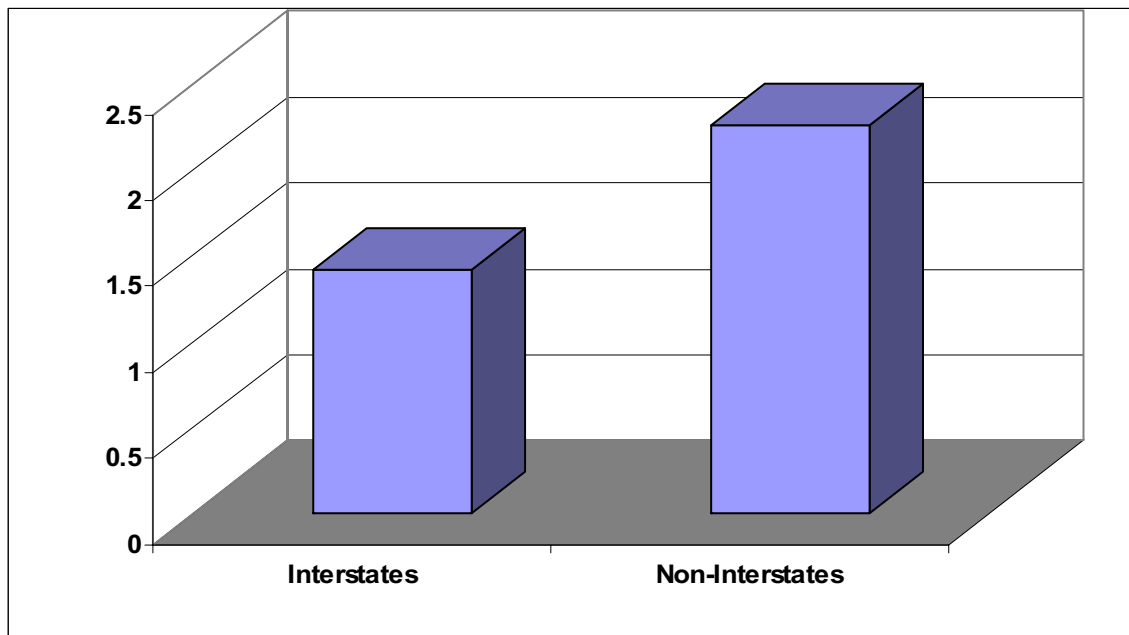
Perhaps the most significant benefit of the Interstate system is that it has greatly improved traffic safety in West Virginia and throughout the U.S. by providing a network of highways with a variety of safety designs that greatly reduce the likelihood of serious accidents.

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 West Virginia's Interstate highways is significantly safer than travel on all other roads and highways in the state. The traffic fatality rate per 100 million vehicle miles of travel on West Virginia's Interstate highways was 1.42 in 2004, the latest year for which data is available. The fatality rate per 100 million vehicle miles of travel in 2004 on West Virginia's non-Interstate routes was 2.26 – 59 percent higher than the rate on the state's Interstates.<sup>14</sup>

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



Source: TRIP analysis of FHWA data

## **Pavement Conditions of West Virginia 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), West Virginia had one percent of its pavements on its Interstate system rated in poor condition and nine percent of its Interstate highways with pavements rated in mediocre condition.<sup>15</sup> Roads rated poor may show signs of deterioration, including rutting, cracks and potholes. In some cases, poor roads can be resurfaced, but often are too deteriorated and must be reconstructed. Roads rated in mediocre condition 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 West Virginia, nine percent of Interstate pavements are rated in fair condition and the remaining 82 percent of Interstate pavements are rated in good condition.<sup>16</sup>

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.<sup>17</sup>

## **Bridge Conditions of West Virginia's Interstate Highways**

Of the 654 bridges on West Virginia's Interstate highways, seven percent are rated as structurally deficient and 12 percent are rated as functionally obsolete.<sup>18</sup> Bridges that are rated structurally deficient show significant signs of deterioration as a result of use and exposure. The Federal Highway Administration (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, clearances or roadway approach alignments that no longer meet the criteria for the system of which the bridge is a part.

While many of the state's Interstate bridges are 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.<sup>19</sup> Older bridges often need significant repairs or rehabilitation or may need to be replaced to continue to provide adequate service. The average age of West Virginia's Interstate bridges is 34 years.<sup>20</sup>

The following chart lists the top 20 most heavily-traveled Interstate bridges in West Virginia that are structurally deficient:

**Chart 3. Most-Heavily Traveled Interstate Bridges that are Structurally Deficient**

<b>County</b>	<b>Route Carried</b>	<b>Route or feature intersected</b>	<b>Average Daily Traffic</b>	<b>Year Built</b>	<b>Lanes</b>
Berkeley	I-81	US 11	26,500	1964	2
Ohio	I-70	Big Wheeling Creek	26,000	1965	3
Ohio	I-70	Wheeling Creek	25,000	1966	2
Kanawha	I-77	SLS 29	22,500	1967	2
Kanawha	I-77	SLS 29	22,500	1967	2
Cabell	I-64	Four Pole Creek & WV 10	21,750	1963	4
Cabell	I-64	Four Pole Creek & WV 10	21,750	1963	4
Ohio	I-70	Wheeling Creek	21,000	1966	2
Cabell	I-64	SLS 35	20,500	1962	2
Cabell	I-64	SLS 35	20,500	1962	2
Cabell	I-64	SLS 60/2	20,000	1962	2
Cabell	I-64	SLS 60/2	20,000	1962	2
Cabell	I-64	SLS 60/52	20,000	1959	2
Cabell	I-64	SLS 60/52	20,000	1959	2
Cabell	I-64	SLS 60/89	20,000	1958	2
Wayne	I-64	SLS 5/1	15,000	1964	2
Wayne	I-64	SLS 5/1	15,000	1964	2
Wayne	I-64	12 Pole Creek	14,500	1962	2
Wayne	I-64	12 Pole Creek	14,500	1962	2
Wayne	I-64	SLS 29	14,250	1962	2

**Source: West Virginia Department of Transportation**

## **Benefits of West Virginia's Interstate System**

The construction of West Virginia'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 significantly 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 West Virginia and many U.S. and international sites has provided lower costs and greater selection to consumers and has opened up new markets to West Virginia 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.<sup>21</sup>

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.<sup>22</sup>

### **Interstate Benefits for Individuals in West Virginia**

TRIP has calculated the annual financial benefit per person and statewide in West Virginia, 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 West Virginia have saved an average of 60 lives per year over the last 10 years.<sup>23</sup> Since 1956, TRIP estimates that Interstate highways have saved approximately 2,400 lives in West Virginia.<sup>24</sup> This estimate is based on a comparison of the annual fatality rate on West Virginia'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 West Virginia's Interstate highways had instead been carried by other major roads in the state, 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 West Virginia's Interstates saves the state \$304 million annually in reduced economic costs as a result of the reduction in fatal or serious traffic accidents, saving \$167 per person annually.<sup>25</sup>

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

**Time and motor fuel:**

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

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

TRIP found that without Interstate highways, West Virginia residents would spend an additional 107 million hours annually traveling in vehicles, or 59 hours per person.<sup>26</sup> TRIP also found that without Interstate highways, West Virginia motorists would use an additional 51 million gallons of motor fuel annually.<sup>27</sup> The total value of the time and motor fuel that is saved annually in West Virginia by the Interstate Highway System is \$947 per person (\$876 in time and \$71 in fuel).<sup>28</sup>

#### **Reduced Consumer Costs:**

The Interstate system has had a significant impact on consumer costs because it reduces 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 West Virginia, 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.<sup>29</sup> 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 West Virginia 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 West Virginia resident saves \$918 per year in reduced consumer costs as a result of the Interstate Highway System. The following chart indicates the annual saving per West Virginia resident for apparel, food, housing and transportation costs as a result of the Interstate Highway System. The total annual statewide savings in West Virginia in reduced consumer costs as a result of the Interstate Highway System is estimated at \$1.7 billion.

**Chart 4. Annual, per person savings in West Virginia, as a result of the Interstate Highway System.**

	<b>ANNUAL SAVINGS</b>
<b>Apparel</b>	<b>\$35</b>
<b>Food</b>	<b>\$125</b>
<b>Housing</b>	<b>\$485</b>
<b>Transportation</b>	<b>\$274</b>
<b>Total</b>	<b>\$918</b>

**Source: TRIP**

The Interstate Highway System provides tremendous benefits every year to the people of West Virginia. The total annual benefit per person in West Virginia of the Interstate system is \$2,032 as a result of increased safety and reductions in the amount of time, fuel and consumer expenses. The total statewide benefit in West Virginia of the Interstate Highway System is approximately \$9.9 billion per year. The following chart shows the combined annual benefit of the Interstate system per person and statewide in West Virginia.

**Chart 5. Total Annual Interstate Benefit Per Person and statewide in West Virginia**

	<b>Per Person</b>	<b>Statewide (millions)</b>
<b>Safety</b>	<b>\$167</b>	<b>\$304</b>
<b>Time and Fuel</b>	<b>\$947</b>	<b>\$1,718</b>
<b>Reduced Consumer Costs</b>	<b>\$918</b>	<b>\$1,667</b>
<b>Total</b>	<b>\$2,032</b>	<b>\$3,689</b>

**Source: TRIP**

## **Meeting West Virginia's Future Interstate Travel Needs**

West Virginia 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 West Virginia's Interstate highways is expected to increase by 67 percent by the year 2026.<sup>30</sup>

The West Virginia Department of Transportation found that by 2026, nearly two-thirds – 351 of 555 miles- of the state's Interstate highway system will be in need of significant rehabilitation or reconstruction to provide a smooth pavement surface.<sup>31</sup> Similarly, nearly half of bridges on West Virginia's Interstate highway system – 46 percent – will need significant repairs or reconstruction by the year 2026 (300 of 654 bridges).<sup>32</sup>

The West Virginia Department of Transportation has also found that it will need to add additional lanes along 142 miles of its existing 555-mile Interstate system by the year 2026 in order to relieve growing traffic congestion.<sup>33</sup>

The West Virginia Department of Transportation has found that the state faces a \$1.4 billion backlog in unfunded Interstate repair and improvements needed over the next 20 years.<sup>34</sup> The total cost of needed repairs and expansion of West Virginia's Interstate highways over the next 20 years is \$2.7 billion.<sup>35</sup> The cost of needed Interstate repairs over the next 20 years is \$2.1 billion and the cost of needed Interstate expansion over the next 20 years is \$600 million, reports the West Virginia Department of Transportation. But the state only has \$1.3 billion available through 2026 for Interstate repairs and improvements, based on current funding assumptions.<sup>36</sup>

## **Conclusion**

Fifty years after construction of the Interstate highway system began, West Virginia, and all of the U.S., continues to reap tremendous benefits from the nation's most critical transportation network. West Virginia's Interstate system has saved approximately 2,400 lives since its inception in 1956 and today it continues to save West Virginia residents time, lives and money and continues to play a critical role in supporting economic growth and enhancing the lifestyle choices of the state's residents and visitors.

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

As West Virginia's citizens look back on the many benefits that the Interstate highway system has provided the state, they must also look ahead to meeting the challenge of providing a 21<sup>st</sup> Century Interstate highway system that will continue to enhance the quality of life of today's and future residents of West Virginia.

## Endnotes

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<sup>1</sup> West Virginia Department of Transportation, 2006. Response to TRIP survey.

<sup>2</sup> Ibid.

<sup>3</sup> TRIP analysis of U.S. Census data.

<sup>4</sup> TRIP analysis of Federal Highway Administration data, including Highway Statistics Summary to 1995 and Highway Statistics 2004.

<sup>5</sup> 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.

<sup>6</sup> TRIP analysis of Highway Statistics, 2004, Federal Highway Administration. Data is from charts VM-2 and HM-20.

<sup>7</sup> TRIP analysis of 1990 and 2004 Federal Highway Statistics, Federal Highway Administration.

<sup>8</sup> Ibid.

<sup>9</sup> TRIP analysis of Highway Statistics, 2004, Federal Highway Administration. Data is from charts VM-2 and HM-20.

<sup>10</sup> West Virginia Department of Transportation, 2006. Response to TRIP survey.

<sup>11</sup> Ibid.

<sup>12</sup> Bureau of Transportation Statistics, U.S. Department of Transportation. 2002 Commodity Flow Survey, State Summaries.

<sup>13</sup> West Virginia Department of Transportation, 2006. Response to TRIP survey.

<sup>14</sup> TRIP analysis of Highway Statistics, 2004, Federal Highway Administration.

<sup>15</sup> TRIP analysis of 2004 Federal Highway Administration data. See charts HM-63 and HM-64 in Highway Statistics 2004.

<sup>16</sup> Ibid.

<sup>17</sup> Selecting a Preventative Maintenance Treatment for Flexible Pavements. R. Hicks, J. Moulthrop. Transportation Research Board. 1999. Figure 1.

<sup>18</sup> West Virginia Department of Transportation, 2006. Response to TRIP survey.

<sup>19</sup> Commonwealth of Pennsylvania. 2005-06 Governor's Executive Budget.

<sup>20</sup> West Virginia Department of Transportation, 2006. Response to TRIP survey.

<sup>21</sup> TRIP analysis of Federal Highway Administration data. See 2004 Federal Highway Statistics, charts HM-60 and VM-2.

<sup>22</sup> Ibid. P. 7.

<sup>23</sup> 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

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number of lives saved was based on calculating fatalities for Interstate travel, if it had occurred on other federal-aid routes in West Virginia.

<sup>24</sup> 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.”

<sup>25</sup> TRIP analysis of National Highway Traffic Safety Administration and Federal Highway Administration data.

<sup>26</sup> TRIP analysis of 2004 Federal Highway data, using speed factors from the 2005 Urban Mobility Report, which is published by the Texas Transportation Institute.

<sup>27</sup> Ibid.

<sup>28</sup> The value of time is based on estimates by the Texas Transportation Institute. The figure used to calculate savings due to reduced fuel use is \$2.50 per gallon of fuel.

<sup>29</sup> 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.

<sup>30</sup> West Virginia Department of Transportation, 2006. Response to TRIP survey.

<sup>31</sup> Ibid.

<sup>32</sup> Ibid.

<sup>33</sup> Ibid.

<sup>34</sup> TRIP analysis of West Virginia Department of Transportation response to TRIP survey. 2006.

<sup>35</sup> Ibid.

<sup>36</sup> Ibid.