

# **The Interstate Highway System in Connecticut:**

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

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

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

## Executive Summary

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

Serving as the most critical transportation link in the state's economy, Connecticut's Interstate highways have significantly improved the lives of its residents and visitors. In Connecticut, 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, Connecticut and the nation again face a challenge in modernizing the system of aging, increasingly congested Interstate highways. If Connecticut's residents and visitors 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 Connecticut'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 Connecticut Department of Transportation (CDOT). 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 Connecticut's transportation system.**

- Connecticut's Interstate system, which includes four percent of all roadway lane miles in the state, carries 32 percent of all vehicle travel in the state.
- Since Interstate construction began in 1956, total vehicle miles of travel in Connecticut increased by 246 percent. Since that time, the number of vehicles in the state has more than tripled, increasing by 213 percent, and the state's population has increased by 51 percent – from 2.3 million to 3.5 million.

**Connecticut's Interstate highway system has provided tremendous benefits to the state's residents and visitors by saving lives because of enhanced safety design, saving time by reducing travel durations and improving the state's economy by enhancing business productivity.**

- Connecticut's Interstate highways have saved approximately 3,000 lives in Connecticut since 1956.
- 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 have higher traffic fatality rates.
- Connecticut's Interstate system has saved an average of 63 lives per year over the last 10 years, based on the above criteria.
- Connecticut's Interstate highways have reduced travel times both within the state and to locations outside of Connecticut. The improved mobility provided by the Interstate system has given Connecticut's residents and visitors greater choices about where they live, work, shop and spend their leisure time.
- By reducing travel times, the Interstate system saves each Connecticut resident 90 hours of travel time annually - 316 million hours state wide.
- Construction of 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 reduces 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 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 improved highway access that was provided by the Interstate system has resulted in lower costs and greater selection of food and other consumer products.
- 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.

**Over the next ten years, Connecticut faces a \$1.6 billion shortfall in needed funding for Interstate projects. Connecticut faces a significant challenge in rebuilding its aging Interstate highways system and providing additional lane capacity to meet growing travel demands. Traffic congestion and pavement conditions are likely to worsen unless the state can fund needed projects.**

- According to the Connecticut Department of Transportation (CDOT), the current anticipated average budget available for all state Interstate construction from 2006 to 2016 (including preservation, maintenance and capacity expansion) is approximately \$1.9 billion.
- CDOT estimates that \$3.5 billion is needed between 2006 and 2016 to allow the state to fund a program that adequately addresses Interstate preservation and capacity needs in Connecticut.
- Approximately \$2.5 billion of the \$3.5 billion needed from 2006 to 2016 would go towards addressing Interstate maintenance, repair and preservation in the state, while the remaining \$1 billion would go towards needed capacity expansion projects.
- CDOT plans to do major reconstruction or rehabilitation on 96 miles - 28 percent - of it's Interstate system over the next five years.
- Ideally, CDOT would like to build an additional 79 lane miles of Interstate in the next 10 years to increase the capacity of the state's Interstate system.
- CDOT has identified three Interstate widening projects that are needed by 2016, including I-84 from Danbury to Waterbury, I-84 from Waterbury to Southington, and I-95 from Branford to New London.
- Approximately 209 bridges – 25 percent - on Connecticut's Interstate system will need either significant repair or reconstruction over the next 10 years.

**Traffic congestion on Connecticut's Interstate highways is increasing as travel growth significantly outpaces the addition of new lanes. Vehicle miles of travel on Connecticut's Interstate increased eight times faster than additional highway capacity.**

- More than half – 56 percent – of Connecticut's 302 miles of urban Interstates are considered congested because they carry traffic levels that result in significant delays during peak travel hours.
- Currently, 56 percent of Connecticut's urban Interstates are congested. If the state's urban Interstate highways are not widened, 81 percent of Connecticut's urban Interstate highways will be congested during peak periods, by the year 2026.
- Vehicle miles of travel increased at a rate eight times faster than the addition of new capacity. From 1990 to 2004, vehicle travel on Connecticut's Interstates increased by 23 percent, from 7.8 billion miles driven annually to 10.1 billion miles driven annually. But actual lane miles on the system only increased by three percent during that same period, from 1,789 total lane miles to 1,848 total lane miles.
- Travel on Connecticut's Interstate highways is expected to increase by 26 percent by the year 2026.
- From 1990 to 2004, the average annual amount of travel per Interstate-lane-mile in Connecticut increased by 25 percent.
- Increasing urban traffic congestion may erode some of the logistics advantages that Connecticut producers and distributors have over competitors as the cost and reliability of shipping goods is negatively affected.
- The ten most congested sections of Interstate highways in Connecticut include segments of I-84 in Hartford, Fairfield and New Haven Counties, as well as sections of I-91 in Hartford County and I-95 in Fairfield, New Haven and New London Counties. A full list of the congested sections can be found in the text of the report.

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

- Travel on Connecticut's Interstate highways by large, commercial trucks is expected to increase by 43 percent by the year 2026.
- Travel by large commercial trucks accounted for 14 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 16 percent of all travel on Connecticut's Interstate highways.
- Every year, \$82 billion in goods are shipped annually from sites in Connecticut and another \$87 billion in goods are shipped annually to sites in Connecticut, mostly by truck.
- Seventy-five percent of the goods shipped annually from sites in Connecticut are carried by trucks and another 21 percent are carried by courier services, which use trucks for part of the deliveries. Similarly, 78 percent of the goods shipped to sites in Connecticut are carried by trucks and another 11 percent are carried by courier services, which use trucks for part of their deliveries.

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

- The features that make Interstates so safe 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 Connecticut's Interstate highways is nearly three times as safe as travel on all other roadways. The fatality rate per 100 million vehicle miles of travel on Connecticut's Interstate system in 2004 was 0.43, while it was 1.15 in 2004 on non-Interstate routes in Connecticut.
- There were 43 traffic fatalities on Connecticut's Interstate highways in 2004. Only 15 percent of the 291 traffic fatalities that occurred in Connecticut in 2004 were on the Interstate system, even though it carried 32 percent of all travel in the state in 2004.

**Connecticut's aging system of Interstate roads and bridges is showing signs of deterioration. Twenty-four percent of pavements on Connecticut's Interstate system is in poor or mediocre condition, and 25 percent of Interstate bridges are structurally deficient or functionally obsolete.**

- Eight percent of Connecticut's Interstate pavements are in poor condition and 13 percent are in mediocre condition. An additional 16 percent of Interstate pavements are in fair condition and the remaining 63 percent are in good condition.
- Three percent of bridges on the state's Interstate system are rated structurally deficient and 22 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 Connecticut's Interstate bridges is 39 years. Older bridges typically need significant repairs, reconstruction or replacement at approximately 50 years. New materials used today provide for a typical timeframe of more than 75 years for major work or replacement due to the use of modern, high performance materials.

**Construction of the Interstate system in Connecticut started in 1956 and was completed in 1995, providing the state with 346 miles of Interstate highways, reaching south and west to New York, north to Massachusetts, east to Rhode Island 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<sup>th</sup>, 1956, called for the construction of a 41,000 mile system of Interstate highways to be paid for by taxes on motorists, such as the federal motor fuel tax. The federal motor fuel tax was set at three cents-per-gallon and is now 18.4 cents-per-gallon.
- Revenues 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 designed and built in Connecticut under the provisions of the 1956 Highway Act was part of I-95 known locally as the Greenwich- Killingly Expressway. I-95 was designed to enter Connecticut from the Connecticut/New York state line to the Connecticut/ Rhode

Island state line in Killingly. The design phase entailed 129 miles of roadway. The final layout of I-95 brought the roadway through the town of North Stonington and into Rhode Island with a length of about 111 miles. I-95 was opened to traffic on October 8, 1958.

- The last section of Connecticut's Interstate to open was the section of I-291 from the overpass of Route 5 in South Windsor to the junction of Interstate 84 in the town of Manchester. Construction began on December 3, 1991 and finished on November 20, 1995.

## **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.

Connecting Connecticut with surrounding states and linking the state's major urban areas, Connecticut's 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 Connecticut's residents and visitors to people and businesses within the state and throughout the nation.

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

In this report, TRIP looks at the history and impact of Connecticut's Interstate highway system, its current use and condition, and finally at 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 states' Interstate system are maintained by investing adequately in needed repairs and improvements to meet the challenges 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 also started 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 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 Connecticut**

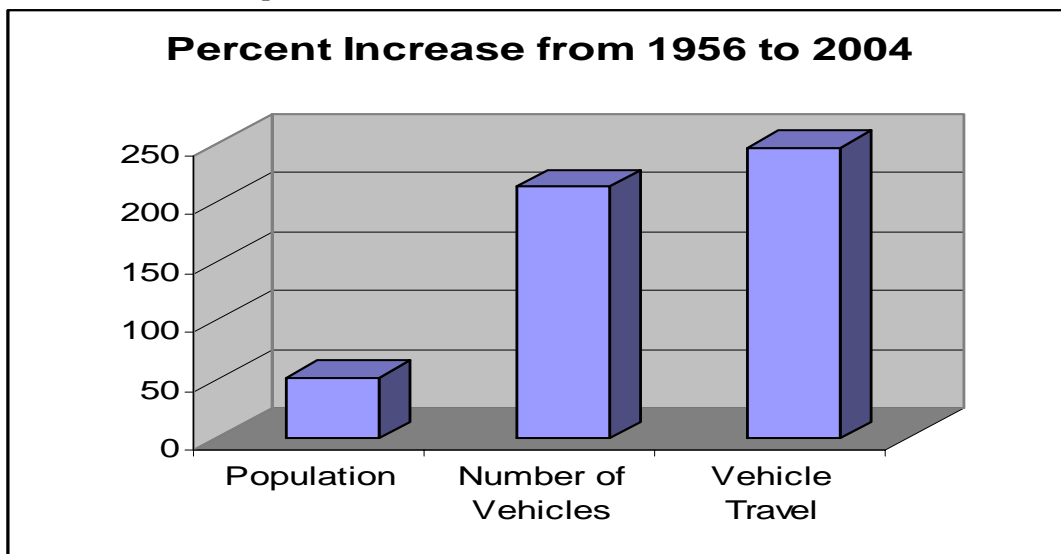
The first section of Interstate designed and built in Connecticut under the provisions of the 1956 highway act was part of I-95 known locally as the Greenwich-Killingly Expressway. I-95 was designed to enter Connecticut from the Connecticut/New York state line to the Connecticut/ Rhode Island state line in Killingly. The design phase entailed 129 miles of roadway. The final layout of I-95 brought the roadway through the town of North Stonington and into Rhode Island with a length of about 111 miles. I-95 was opened to traffic on October 8, 1958.

The last section of Connecticut's Interstate to open was the section of I-291 from the overpass of Route 5 in South Windsor to the junction of Interstate 84 in the town of Manchester. This project started on December 3, 1991 and finished on November 20, 1995.

### **Trends In Interstate Travel and Capacity**

Since the beginning of the Interstate era 50 years ago, Connecticut has seen significant 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 51 percent from approximately 2.3 million to 3.5 million, and the number of motor vehicles increased by 213 percent from approximately 971,000 vehicles to three million. Vehicle travel in Connecticut has increased by 246 percent during that time, from 8.8 billion miles driven annually to 31.6 billion miles driven annually.<sup>1</sup>

**Chart 1. Percent Increase in Population, Vehicles and Travel in Connecticut, 1956-2004.**



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

## **Traffic Congestion on Connecticut'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 Connecticut's transportation system. While Interstate highways account for only four percent of all lane miles of roads in the state, they carry 32 percent of all travel in the state.<sup>2</sup>

Travel on Connecticut's Interstate highways continues to grow at a significant rate, although there has been very little expansion of the system in recent years. From 1990 to 2004, vehicle travel on the state's Interstates increased by 23 percent from 7.8 billion miles driven annually to 10.1 billion miles driven annually.<sup>3</sup> Yet during the same 1990 to 2004 period, total lanes miles on Connecticut's Interstate system increased by only three percent from 1,789 lane miles to 1,848 lane miles. Thus, vehicle miles of travel increased at a rate eight times faster than the addition of new capacity. In fact, the average annual amount of travel per Interstate lane mile in Connecticut increased by 21 percent from 1994 to 2004.

This increase in traffic on Connecticut's Interstate highways has resulted in a significant increase in traffic congestion levels. More than one half – 56 percent – of Connecticut's 302 miles of urban Interstates are considered congested because they carry traffic levels that result in significant delays during peak travel hours.<sup>4</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, 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 vehicles 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 Connecticut were identified by comparing current traffic volumes with overall design capacity (volume/service ratio, or VSF).

The following chart indicates the Interstate highway segments in Connecticut that experience the greatest levels of traffic congestion.

**Chart 2: The Most Heavily Congested Sections of Urban Connecticut Interstates**

Route	Location	From	To	Length	Daily Traffic	Lanes	VSF
I-84	Hartford, East Hartford	Near EB Exit To NB I-91	Near End OP Conn River	0.6	119,500	4	1.45
I-84	Plainville	WB Jct NB Rte 72 (Exit 33)	EB Jct SB Rte 72 (EB Exit 35)	0.5	126,400	5	1.16
I-84	East Hartford	Near Forbes St - Br #5556	WB Jct WB I-384	0.2	157,100	8	1.16
I-91	Hartford	Wethersfield - Hartford Border	NB Exit 27 To Brainard Rd	0.2	126,000	6	1.16
I-84	West Hartford, Hartford	WB Exit 39A To SB Rte 9	WB Exit 45 Jct SB SR 504	4.0	125,700	6	1.13
I-84	Bethel	EB Acc From Rte 6 EB	EB Exit 9 To Rte 25	2.7	81,400	4	1.11
I-84	Waterbury, Cheshire	Near UP Rt. 69 (Hamilton Ave)	EB Exit 27 to EB I-691(TR 835)	6.2	89,200	4	1.10
I-95	Waterford	NB Acc From Rte 85 (Broad St)	NB Jct SR 624 (Waterford Pkwy)	0.3	75,200	4	1.10
I-95	Norwalk	NB Acc From Scribner Ave	NB Exit 16 To East Ave #1	1.4	133,700	6	1.09
I-84	Danbury	Rte 37 - Br #0956	Near EB End OP SR	2.0	116,000	6	1.08
I-91	Wethersfield	0.22 Mi S Of NB Exit 25 To NB Rte 3	Near SB Exit 26 To Great Meadow Rd	0.9	119,300	6	1.08
I-84	Farmington	EB Jct EB US 6	EB Exit 39A To SB Rte 9	0.6	160,500	6	1.07
I-84	Newtown	EB Jct EB US 6	EB Exit 11 To SSR 490	0.8	76,800	4	1.06
I-84	Southington	EB Exit From WB I-691	Near EB Jct NB SR 597	1.3	76,600	4	1.06
I-91	Hartford	Near SB Exit 29A To WB SR 598	Near NB Acc From WB I-84	0.7	81,000	4	1.06
I-95	Stamford	NB Acc From S. State St #2	Near SB Acc From Main St	0.7	132,800	6	1.06
I-95	West Haven, New Haven	SB Exit 43 To Rte 122 & SR 745	End OP Rte 10 (Boulevard)	0.7	136,300	6	1.05
I-95	East Haven, Branford	NB Acc From US 1	0.22 Mi S Of UP Hosley Ave	1.0	86,600	4	1.04
I-95	Fairfield	NB Acc From US 1	NB Exit 22 To Round Hill Rd	1.4	129,400	6	1.03
I-95	Stratford	NB Acc From Surf Ave.	Near SB Acc From Rte 130 WB	2.1	115,400	6	1.03
I-95	Greenwich, Stamford	NY - CT State Line	NB Exit 8 To Atlantic St	7.6	133,600	6	1.02
I-95	Fairfield, Bridgeport	NB Acc From Johnson Dr	NB Exit 27A Jct Rt 8 & Rt 25	2.0	132,500	6	1.02
I-95	New Haven	NB Acc From I-91	NB Exit 49 To Stiles St	0.8	123,100	6	1.02

**Source: Connecticut Department of Transportation**

### **Freight Shipment by Large Trucks on Connecticut's Interstate Highways**

Every year, \$82 billion in goods are shipped from sites in Connecticut and another \$87 billion in goods are shipped to sites in Connecticut, mostly by trucks.<sup>5</sup> In fact, 75 percent of the goods shipped annually from sites in Connecticut are carried by trucks and another 21 percent are carried by courier services, which use trucks for part of their deliveries. Similarly, 78 percent of the goods shipped to sites in Connecticut 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. Nationally, Interstate highways account for 50 percent of travel by large trucks.<sup>6</sup> In 2004, travel by large commercial trucks accounted for 14 percent of all miles traveled on Connecticut's Interstate system.

### **Traffic Safety on Connecticut's Interstate Highways**

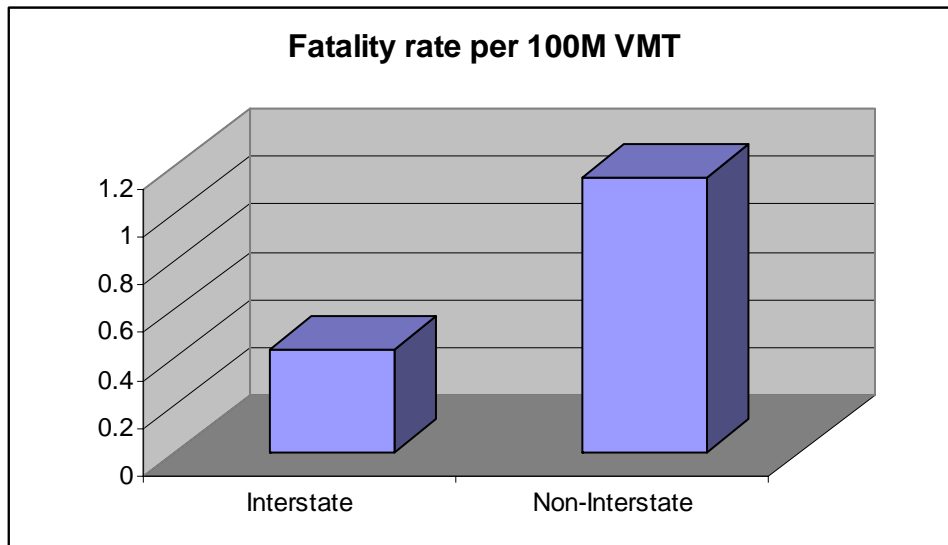
Perhaps the most significant benefit of the Interstate system is that it has greatly improved traffic safety in Connecticut and throughout the U.S. by providing travelers with a network of highways with a variety of safety designs that greatly reduce the likelihood of serious accidents.

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 Connecticut's Interstate highways is nearly three times 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 Connecticut's Interstate highways was 0.43, in 2004, the latest year for which data is available. The fatality rate per 100 million vehicle miles of travel in 2004 on Connecticut's non-Interstate routes was 1.15 – nearly triple the rate on the state's Interstates.

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



**Source: TRIP analysis of FHWA data**

Connecticut's Interstate Highway System, which carried 32 percent of the state's travel in 2004, accounted for only 15 percent of the state's fatalities as a result of its superior traffic safety features. There were 43 traffic fatalities on Connecticut's Interstate highways in 2004 – 15 percent of the 291 traffic fatalities, that occurred in Connecticut in 2004.

## **Pavement Conditions of Connecticut 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.<sup>7</sup>

In 2004 (the latest year for which data is available), eight percent of Connecticut's Interstate highways were rated in poor condition and 13 percent were rated in mediocre condition.<sup>8</sup> Roads rated poor are badly cracked or broken. In some cases, poor roads can be resurfaced, but often are too deteriorated and must be reconstructed. Roads rated in mediocre condition show signs of significant wear and may also have some visible pavement distress. Most pavements in mediocre condition can be repaired by resurfacing, but some may need more extensive reconstruction to return them to good condition. In Connecticut, 16 percent of Interstate pavements are rated in fair condition and the remaining 63 percent of Interstate pavements are rated in good condition.<sup>9</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>10</sup>

### **Bridge Conditions of Connecticut's Interstate Highways**

Of the 898 bridges on Connecticut's Interstate highways, three percent are rated as structurally deficient and an additional 22 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. A structurally deficient bridge has at least one major structural component (deck, superstructure, or substructure) rated in poor or worse condition or the bridge is not capable of carrying all legal loads. The condition of the bridge may require major maintenance work, minor or major rehabilitation, or even replacement. A structurally deficient bridge may be able to provide several years of safe service before receiving the necessary work to restore it to fair or better condition. It should be noted that by definition a structurally deficient bridge is not functionally obsolete.

A functionally obsolete bridge does not meet current functionality criteria. For example, the width of the structure may be insufficient to accommodate current traffic volumes; or the structure has substandard vertical or lateral clearances; or the waterway adequacy is inadequate; or the approach roadway alignment at the bridge is poor. It should be noted that by definition a functionally obsolete bridge is not structurally deficient.

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.<sup>11</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 Connecticut’s Interstate bridges is 39 years.<sup>12</sup> A new bridge today is designed with a time frame of 75-year + for major work or replacement due to the use of high performance materials

The following is a listing of the 20 most heavily traveled structurally deficient Interstate bridges in Connecticut.

**Chart 4: The 20 most heavily traveled Interstate bridges in Connecticut that are structurally deficient.**

County	Route Carried	Route or feature intersected	Average Daily Traffic	Year Built	Lanes
New Haven	I-95	West River & SR 745	146,100	1957	6
Fairfield	I-95	Route 33	130,400	1957	8
Fairfield	I-95	Cherry Street	130,100	1958	6
Fairfield	I-95	Metro North Railroad	123,700	1958	6
Fairfield	I-95	MNRR & Local Roads	116,100	1958	6
New Haven	I-91	Route 17	111,700	1965	9
Fairfield	I-95	Housatonic River-Naug Avenue	111,200	1958	6
Fairfield	I-95	Canal Street	108,600	1958	6
Hartford	I-84 EB	Amtrak;Local roads;Parking	83,400	1965	3
Hartford	I-84 WB	Amtrak;Local roads;Parking	83,400	1965	4
New Haven	I-84 EB	I-84WB, Route 8, Naugatuck River	74,900	1967	2
New Haven	I-91 NB	US 5 & Amtrak & Ferry Street	62,400	1964	4
Tolland	I-84	Skungamaug River	55,900	1954	8

Tolland	I-84 WB	Bike Path	49,300	1952	3
Tolland	I-84 EB	Bike Path	49,300	1978	4
Hartford	I-84 EB	Marion Avenue	44,650	1963	3
Hartford	I-84 WB	Marion Avenue	44,650	1963	3
Hartford	I-84 WB	B&M Railroad (abandoned)	41,500	1963	4
Hartford	I-84 WB	Route 10	39,900	1963	4
Fairfield	I-84 EB	Center Street	35,550	1978	2

**Source: Connecticut Department of Transportation**

### **Benefits of Connecticut's Interstate System**

The construction of Connecticut'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.

The benefits include improved safety, time saved as a result of quicker travel, reduced consumer costs and improved business productivity.

#### **Safety:**

By carrying significant volumes of traffic on safer roadways, the Interstate saves numerous lives annually. TRIP estimates that Interstate highways in Connecticut have saved an average of 63 lives per year over the last 10 years.<sup>13</sup> Since 1956, TRIP estimates that Interstate highways have saved approximately 3,000 lives in Connecticut.<sup>14</sup> This estimate is based on a comparison of the annual fatality rate on Connecticut 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 Connecticut'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.

**Time:**

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. This in turn has also increased the choices people have of where to live, work, shop and travel. By reducing travel times, the Interstate system saves each Connecticut resident 90 hours of travel time annually - 316 million hours state wide.

**Reduced consumer costs and increased productivity:**

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 Connecticut and many U.S. and international sites has provided lower costs and greater selection to consumers and has opened up new markets to Connecticut 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>15</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 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, increased small package delivery, demand-side inventory management and by 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>16</sup>

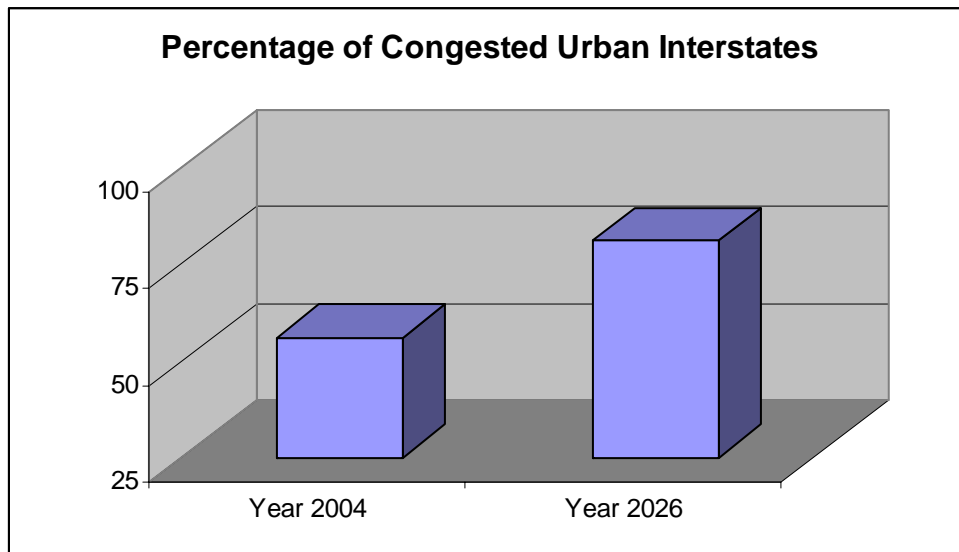
### **Meeting Connecticut's Future Interstate Travel Needs**

Connecticut 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 Connecticut's Interstate highways is expected to increase by 26 percent by the year 2026. Similarly, large truck travel is expected to increase rapidly on Connecticut's Interstate highway system, increasing by 43 percent by the year 2026.<sup>17</sup> Large truck travel is expected to account for 16 percent of all Interstate travel in Connecticut by the year 2026, compared to 14 percent in 2004.<sup>18</sup>

Traffic congestion, which currently afflicts 56 percent of the state's urban Interstate highways, is expected to worsen substantially on Connecticut's urban Interstate highways, unless additional lanes are added to these routes. If by the year 2026, the state's urban Interstate highways are not widened, 81 percent will be congested during peak periods.<sup>19</sup>

**Chart 5. Percentage of Urban Interstates Currently Congested and Percentage That Will Be Congested Unless Additional Lane Capacity is Added**



**Source: TRIP analysis of Connecticut Department of Transportation data**

The Connecticut Department of Transportation has identified three sections of urban Interstates that need to be widened over the next 10 years to accommodate growing traffic. The three sections, which total approximately 79 miles, are located on I-84 and I-95.<sup>20</sup> Completing these projects would help relieve traffic congestion in these areas.

**Chart 6: Interstate widening projects that are needed by 2016**

Route	From	To	Length (Mi.)	Current Lanes	Lanes after Widening
I-84	Danbury	Waterbury	31	2	3
I-84	Waterbury	Southington	8.5	2	3
I-95	Branford	New London	39.8	2	3

**Source: Connecticut Department of Transportation**

Connecticut also needs to begin 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. The Connecticut Department of Transportation (CDOT) plans to do major reconstruction or rehabilitation on 96 miles - 28 percent - of its Interstate system over the next five years. Ideally, CDOT would like to build an additional 79 lane miles of Interstate in the next 10 years to increase the capacity of the state's Interstate system. Approximately 209 bridges – 26 percent - on Connecticut's Interstate system will need either significant repair or reconstruction over the next 10 years.

The following is a list of Interstate highway reconstruction projects for which a significant need exists over the next ten years.

**Chart 7. Interstate projects needed over the next ten years.**

Route	County	Town(s)	From	To	Length	Work Needed
I-84	Hartford / NH	Waterbury, Cheshire	Washington St. Bridge	Marion Road Bridge	6.2	Reconstruction / Widening
I-95	New Haven	New Haven, East Haven, Branford	Howard Ave. Bridge	SB Exit 54 To Cedar St	7.1	Major Reconstruction
I-84	Hartford	Farmington, West Hartford	Near EB Acc From Fieneman Rd	SR 535 (Ridgewood Rd) Bridge	3.1	Reconstruction / Widening
I-95	Fairfield	Darien	NB Acc From Hecker Ave.	Darien - Norwalk TL	2.3	Reconstruction / Operational
I-84	Fairfield	Danbury, Bethel, Brookfield, Newtown	Near EB Exit To Rest Area	EB Exit 11 To SR 490	15.5	Reconstruction / Operational
I-95	New London	Old Lyme, East Lyme, Waterford, New London	Near SB Acc From US 1 & Rte 156	Near NB Acc From SR 624	13.7	Reconstruction / Operational
I-95	New London	Groton, Stonington, North Stonington	Near New London - Groton TL	Connecticut - Rhode Island SL	17.3	Reconstruction / Operational

**Source: Connecticut Department of Transportation**

### **Connecticut's Future Interstate Needs**

Over the next ten years, Connecticut faces a \$1.6 billion shortfall in needed funding for Interstate projects. Traffic congestion and pavement conditions are likely to worsen unless the state can fund needed projects.

According to the Connecticut Department of Transportation, the current anticipated average budget available for all state Interstate construction (including preservation, maintenance and capacity expansion) from 2006 to 2016 is \$1.9 billion. However, CDOT estimates that \$3.5 billion is needed from 2005 to 2016 to allow the state to fund a program that adequately addresses Interstate preservation and capacity needs in Connecticut. Approximately \$2.5 billion of the needed \$3.5 billion would go towards addressing Interstate maintenance, repair and preservation in the state, while the remaining \$1 billion would go towards needed capacity expansion projects.

Connecticut's Interstate system, as well as the state's entire surface transportation system, must be adequately maintained and funded if the state's residents and visitors are to continue to reap the benefits of a safe and effective transportation system.

## **Conclusion**

Fifty years after construction of the Interstate highway system began, Connecticut and all of the U.S. continues to reap tremendous benefits from the nation's most critical transportation network. Connecticut's Interstate system has saved approximately 3,000 lives since its inception in 1956 and today it continues to save Connecticut residents time, 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 Connecticut's businesses and is integral to the functioning of the state's economy.

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

As Connecticut's residents look back on the many benefits that the Interstate Highway Hystem 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 today and in the future.

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## Endnotes

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- <sup>1</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>2</sup> TRIP analysis of Highway Statistics, 2004, Federal Highway Administration. Data is from charts VM-2 and HM-20.
- <sup>3</sup> TRIP analysis of 1990 and 2004 Federal Highway Administration data. See chart VM-2 in Highway Statistics 1990 and Highway Statistics 2004.
- <sup>4</sup> Connecticut Department of Transportation, 2005. Response to TRIP survey.
- <sup>5</sup> Bureau of Transportation Statistics, U.S. Department of Transportation. 2002 Commodity Flow Survey, State Summaries.
- <sup>6</sup> TRIP analysis of 2003 Federal Highway Administration data. 2003 Highway Statistics. Chart VM-1.
- <sup>7</sup> Ibid.
- <sup>8</sup> TRIP analysis of 2004 Federal Highway Administration data. See charts HM-63 and HM-64 in Highway Statistics 2004.
- <sup>9</sup> Ibid.
- <sup>10</sup> Selecting a Preventative Maintenance Treatment for Flexible Pavements. R. Hicks, J. Moulthrop. Transportation Research Board. 1999. Figure 1.
- <sup>11</sup> Commonwealth of Pennsylvania. 2005-06 Governor's Executive Budget.
- <sup>12</sup> TRIP analysis of Connecticut Department of Transportation response to 2005 TRIP survey.
- <sup>13</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 number of lives saved was based on calculating fatalities for Interstate travel, if it had occurred on other federal-aid routes in Connecticut.
- <sup>14</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>15</sup> TRIP analysis of Federal Highway Administration data. See 2004 Federal Highway Statistics, charts HM-60 and VM-2.
- <sup>16</sup> Ibid. P. 7.
- <sup>17</sup> Connecticut Department of Transportation, 2005. Response to TRIP survey.
- <sup>18</sup> TRIP analysis of Connecticut Department of Transportation data supplied in response to 2005 TRIP survey.
- <sup>19</sup> Connecticut Department of Transportation, 2005. Response to TRIP survey.
- <sup>20</sup> Ibid.