

***CONNECTICUT'S TOP  
TRANSPORTATION ISSUES:***

Meeting the State's Need for Safe, Smooth and  
Efficient Mobility

**NOVEMBER 2015**



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

## **Executive Summary**

Seven years after the nation suffered a significant economic downturn, Connecticut's economy continues to rebound. The rate of economic growth in Connecticut, which will be greatly impacted by the reliability and condition of the state's transportation system, continues to have a significant impact on quality of life in the Constitution State.

An efficient, safe and well-maintained transportation system provides economic and social benefits by affording individuals access to employment, housing, healthcare, education, goods and services, recreation, entertainment, family, and social activities. It also provides businesses with access to suppliers, markets and employees, all critical to a business' level of productivity and ability to expand. Conversely, reduced accessibility and mobility - as a result of traffic congestion, a lack of adequate capacity, or deteriorated roads, highways, bridges and transit facilities - diminishes a region's quality of life by reducing economic productivity and limiting opportunities for economic, health or social transactions and activities.

As the insurance capital of the nation and with an economy based largely on finance, engineering, manufacturing, information technology, electronics, agriculture and mining, the quality of Connecticut's transportation system will play a vital role in the state's level of economic growth and in the quality of life in Connecticut.

In this report, TRIP looks at the top transportation issues faced in Connecticut as the state addresses its need to modernize and maintain its system of roads, highways, bridges and transit systems.

Signed into law in July 2012, MAP-21 (Moving Ahead for Progress in the 21<sup>st</sup> Century Act), has improved several procedures that in the past had delayed projects. MAP-21 does not address long-term funding challenges facing the federal surface transportation program. The current federal transportation legislation was initially set to expire on September 30, 2014. However, following numerous short-term extensions passed by Congress, the bill is now set to expire on December 4, 2015. Congress will need to pass new legislation prior to the expiration to ensure prompt federal reimbursements to states for road, highway, bridge and transit repairs and improvements.

The level of funding and the provisions of the federal surface transportation program have a significant impact on highway and bridge conditions, roadway safety, transit service, quality of life and economic development opportunities in Connecticut.

## **COST TO CONNECTICUT MOTORISTS OF DEFICIENT ROADS**

**An inadequate transportation system costs Connecticut motorists a total of \$5.1 billion every year in the form of additional vehicle operating costs (VOC), congestion-related delays and traffic crashes.**

- TRIP estimates that Connecticut roadways that lack some desirable safety features, have inadequate capacity to meet travel demands or have poor pavement conditions cost the state's residents approximately \$5.1 billion annually in the form of additional vehicle operating costs (including accelerated vehicle depreciation, additional repair costs, and increased fuel consumption and tire wear), the cost of lost time and wasted fuel due to traffic congestion, and the financial cost of traffic crashes.
- TRIP has calculated the average cost to drivers in the state's largest urban areas as a result of driving on roads that are deteriorated, congested and lack some desirable safety features. The chart below details the costs to drivers in the Bridgeport/Stamford, Hartford and New Haven urban areas.

<b>Location</b>	<b>VOC</b>	<b>Congestion</b>	<b>Safety</b>	<b>TOTAL</b>
<b>Bridgeport/Stamford</b>	\$701	\$1,174	\$347	\$2,222
<b>Hartford</b>	\$654	\$1,038	\$544	\$2,236
<b>New Haven</b>	\$707	\$932	\$411	\$2,050
<b>Connecticut</b>	<b>\$1.6 Billion</b>	<b>\$2.3 Billion</b>	<b>\$1.2 Billion</b>	<b>\$5.1 Billion</b>

## **POPULATION AND ECONOMIC GROWTH IN CONNECTICUT**

**The rate of population and economic growth in Connecticut have resulted in increased demands on the state's major roads and highways, leading to increased wear and tear on the transportation system.**

- Connecticut's population reached approximately 3.6 million residents in 2014, a nine percent increase since 1990.
- Connecticut had 2.5 million licensed drivers in 2013.
- Vehicle miles traveled (VMT) in Connecticut increased by 18 percent from 1990 to 2013 –from 26.3 billion VMT in 1990 to 30.9 billion VMT in 2013.
- By 2030, vehicle travel in Connecticut is projected to increase by another 15 percent.
- From 1990 to 2013, Connecticut's gross domestic product, a measure of the state's economic output, increased by 41 percent, when adjusted for inflation. U.S. GDP increased 65 percent during this time.

## **CONNECTICUT ROAD CONDITIONS**

**A lack of adequate state and local funding has resulted in one-third of major urban roads and highways in Connecticut and one-quarter of major rural roads and highways having pavement surfaces in poor condition, providing a rough ride and costing motorists in the form of additional vehicle operating costs.**

- Thirty-three percent of Connecticut’s major locally and state-maintained urban roads and highways have pavements in poor condition, while an additional 46 percent of the state’s major state and locally maintained urban roads are rated in mediocre or fair condition and the remaining 21 percent are rated in good condition.
- Twenty-five percent of Connecticut’s major locally and state-maintained rural roads and highways have pavements in poor condition, while an additional 48 percent of the state’s major state and locally maintained rural roads are rated in mediocre or fair condition and the remaining 27 percent are rated in good condition.
- Roads rated in poor condition 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.
- Driving on rough roads costs Connecticut motorists a total of \$1.6 billion annually in extra vehicle operating costs. Costs include accelerated vehicle depreciation, additional repair costs, and increased fuel consumption and tire wear.
- The chart below details pavement conditions on major urban roads in the Bridgeport/Stamford, Hartford and New Haven urban areas:

<b>Location</b>	<b>Poor</b>	<b>Mediocre</b>	<b>Fair</b>	<b>Good</b>
<b>Bridgeport/Stamford</b>	44%	30%	14%	12%
<b>Hartford</b>	37%	35%	15%	13%
<b>New Haven</b>	45%	30%	10%	15%

## **CONNECTICUT BRIDGE CONDITIONS**

**More than one-third of locally and state-maintained bridges in Connecticut show significant deterioration or do not meet current design standards often because of narrow lanes, inadequate clearances or poor alignment. This includes all bridges that are 20 feet or more in length.**

- Nine percent of Connecticut’s bridges are structurally deficient. A bridge is structurally deficient if there is significant deterioration of the bridge deck, supports or other major components. Structurally deficient bridges are often posted for lower weight or closed to traffic, restricting or redirecting large vehicles, including commercial trucks and emergency services vehicles.

- Twenty-six percent of Connecticut’s bridges are functionally obsolete. Bridges that are functionally obsolete no longer meet current highway design standards, often because of narrow lanes, inadequate clearances or poor alignment.
- The chart below details bridge conditions in the Bridgeport/Stamford, Hartford and New Haven urban areas:

	Structurally Deficient Number	Structurally Deficient Percentage	Functionally Obsolete Number	Functionally Obsolete Percentage	Total Bridges
Bridgeport-Stamford	90	11%	338	41%	832
Hartford	81	9%	203	23%	898
New Haven	64	7%	300	34%	873

## **HIGHWAY SAFETY AND FATALITY RATES IN CONNECTICUT**

**Improving safety features on Connecticut’s roads and highways would likely result in a decrease in the state’s traffic fatalities and serious crashes. It is estimated that roadway features are likely a contributing factor in approximately one-third of all fatal and serious traffic crashes.**

- Between 2009 and 2013 a total of 1,274 people were killed in traffic crashes in Connecticut, an average of 255 fatalities per year.
- Connecticut’s overall traffic fatality rate of 0.89 fatalities per 100 million vehicle miles of travel in 2013 is lower than the national average of 1.09.
- The chart below details the average number of fatalities from 2011 to 2013 in Bridgeport/Stamford, Hartford and New Haven, as well as the average cost per driver as a result of traffic crashes.

Location	Ave. Fatalities	Safety Cost
<b>Bridgeport/Stamford</b>	47	\$347
<b>Hartford</b>	58	\$544
<b>New Haven</b>	60	\$411

- Roadway features that impact safety include the number of lanes, lane widths, lighting, lane markings, rumble strips, shoulders, guard rails, other shielding devices, median barriers and intersection design. The cost of serious crashes includes lost productivity, lost earnings, medical costs and emergency services.
- Several factors are associated with vehicle crashes that result in fatalities, including driver behavior, vehicle characteristics and roadway features. TRIP estimates that roadway features are likely a contributing factor in approximately one-third of fatal traffic crashes.

- Where appropriate, highway improvements can reduce traffic fatalities and crashes while improving traffic flow to help relieve congestion. Such improvements include removing or shielding obstacles; adding or improving medians; improved lighting; adding rumble strips, wider lanes, wider and paved shoulders; upgrading roads from two lanes to four lanes; and better road markings and traffic signals.
- Investments in rural traffic safety have been found to result in significant reductions in serious traffic crashes. A 2012 report by the [Texas Transportation Institute](#) (TTI) found that improvements completed recently by the Texas Department of Transportation that widened lanes, improved shoulders and made other safety improvements on 1,159 miles of rural state roadways resulted in 133 fewer fatalities on these roads in the first three years after the improvements were completed (as compared to the three years prior). TTI estimates that the improvements on these roads are likely to save 880 lives over the next 20 years.

## **CONNECTICUT TRAFFIC CONGESTION**

**Increasing levels of traffic congestion cause significant delays in Connecticut, particularly in its larger urban areas, choking commuting and commerce. Traffic congestion robs commuters of time and money and imposes increased costs on businesses, shippers and manufacturers, which are often passed along to the consumer.**

- Based on Texas Transportation Institute (TTI) estimates, the value of lost time and wasted fuel in Connecticut is approximately \$2.3 billion per year.
- According to TTI, the average driver in the Bridgeport/Stamford urban area loses \$1,174 each year in the cost of lost time and wasted fuel as a result of traffic congestion. The average Bridgeport/Stamford commuter wastes 49 hours each year stuck in traffic.
- According to TTI, the average driver in the Hartford urban area loses \$1,038 each year in the cost of lost time and wasted fuel as a result of traffic congestion. The average Hartford commuter wastes 45 hours each year stuck in traffic.
- TTI estimates that the average driver in the New Haven area loses \$932 annually in the cost of lost time and wasted fuel due to traffic congestion. The average New Haven commuter wastes 40 hours each year stuck in traffic.
- Increasing levels of congestion add significant costs to consumers, transportation companies, manufacturers, distributors and wholesalers and can reduce the attractiveness of a location to a company when considering expansion or where to locate a new facility. Congestion costs can also increase overall operating costs for trucking and shipping companies, leading to revenue losses, lower pay for drivers and employees, and higher consumer costs.
- Forty-two percent of businesses surveyed by the Connecticut Business and Industry Association believe that the state's road congestion restricts or limits the territory of their market.

- Fifteen percent of businesses surveyed by the Connecticut Business and Industry Association have considered relocation because of regional transportation concerns.

## **CONNECTICUT'S TRANSIT SYSTEM**

**Connecticut's heavily traveled and aging transit system, which plays a vital role in providing mobility in the state, has significant preservation needs to replace aging vehicles and to repair rail lines and bridges.**

- Connecticut's transit network includes 20 urban and rural systems, including the CTfastrack Bus Rapid Transit line in Hartford and the New Haven Line, the nation's busiest commuter rail corridor.
- Connecticut's transit system provides 42 million bus passenger trips per year on 1,100 buses and paratransit vehicles, and 41 million rail passenger trips per year on 500 rail cars and coaches traveling on 226 route miles.
- The preservation needs for Connecticut's bus transit system total \$2 billion, while the preservation needs for the state's rail transit system is \$14.5 billion.
- The average age of state-maintained buses in Connecticut is seven years, while the average age of buses maintained by local agencies is nine years. The average service life of a bus is 12 years.
- Twenty-two percent of rail bridges that carry commuter rail in Connecticut are in poor condition.

## **TRANSPORTATION FUNDING IN CONNECTICUT**

**Investment in Connecticut's roads, highways and bridges is funded by local, state and federal governments. A lack of sufficient funding at all levels will make it difficult to adequately maintain and improve the existing transportation system.**

- From 2009 to 2013, the federal government provided \$1.75 for road improvements in Connecticut for every dollar the state paid in federal motor fuel fees.
- Signed into law in July 2012, MAP-21 (Moving Ahead for Progress in the 21<sup>st</sup> Century Act), has improved several procedures that in the past had delayed projects, MAP-21 does not address long-term funding challenges facing the federal surface transportation program.
- Following numerous short-term extensions passed by Congress, the current federal surface transportation legislation is set to expire on December 4, 2015. Congress will need to pass new legislation prior to the extension expiration to ensure prompt federal reimbursements to states for road, highway, bridge and transit repairs and improvements. If Congress decides to provide additional revenues into the federal Highway Trust Fund in tandem with authorizing a new federal surface transportation program, a number of technically feasible revenue options have been identified by the [American Association of](#)

### State Highway and Transportation Officials.

- A significant boost in investment on the nation's roads, highways, bridges and public transit systems is needed to improve their condition and to meet the nation's transportation needs, concluded a new report from the American Association of State Highway and Transportation Officials.
- The [2015 AASHTO Transportation Bottom Line Report](#) found that annual investment in the nation's roads, highways and bridges needs to increase from \$88 billion to \$120 billion and from \$17 billion to \$43 billion in the nation's public transit systems, to improve conditions and meet the nation's mobility needs.
- The [2015 AASHTO Transportation Bottom Line Report](#) also found that the current backlog in needed road, highway and bridge improvements is \$740 billion.

## **TRANSPORTATION AND ECONOMIC GROWTH IN CONNECTICUT**

**The efficiency of Connecticut's transportation system, particularly its highways, is critical to the health of the state's economy. Businesses rely on an efficient and dependable transportation system to move products and services. A key component in business efficiency and success is the level and ease of access to customers, markets, materials and workers.**

- Annually, \$143 billion in goods are shipped from sites in Connecticut and another \$119 billion in goods are shipped to sites in Connecticut, mostly by truck.
- Seventy-three percent of the goods shipped annually from sites in Connecticut are carried by trucks and another 18 percent are carried by courier services or multiple mode deliveries, which include trucking.
- Businesses have responded to improved communications and greater competition by moving from a push-style distribution system, which relies on low-cost movement of bulk commodities and large-scale warehousing, to a pull-style distribution system, which relies on smaller, more strategic and time-sensitive movement of goods.
- Increasingly, companies are looking at the quality of a region's transportation system when deciding where to re-locate or expand. Regions with congested or poorly maintained roads may see businesses relocate to areas with a smoother, more efficient and more modern transportation system.
- Highway accessibility was ranked the number two site selection factor behind only the availability of skilled labor in a 2013 survey of corporate executives by [Area Development Magazine](#).
- The [Federal Highway Administration](#) estimates that each dollar spent on road, highway and bridge improvements results in an average benefit of \$5.20 in the form of reduced

vehicle maintenance costs, reduced delays, reduced fuel consumption, improved safety, reduced road and bridge maintenance costs and reduced emissions as a result of improved traffic flow.

*Sources of information for this report include the Connecticut Department of Transportation (ConnDOT), the Federal Highway Administration (FHWA), the American Association of State Highway and Transportation Officials (AASHTO), the Bureau of Transportation Statistics (BTS), the U.S. Census Bureau, the Texas Transportation Institute (TTI) and the National Highway Traffic Safety Administration (NHTSA).*

## **Introduction**

Connecticut's roads, highways and bridges form vital transportation links for the state's residents, visitors and businesses, providing daily access to homes, jobs, shopping, natural resources and recreation. Modernizing Connecticut's transportation system is critical to fostering quality of life improvements and economic competitiveness in the Constitution State.

Supporting quality of life and a robust economy in Connecticut requires that the state provide a safe, efficient and well-maintained transportation system. Inadequate transportation investment in Connecticut, which will result in deteriorated transportation facilities and diminished access, will negatively affect economic competitiveness and quality of life in the state.

To accommodate population and economic growth, maintain its level of economic competitiveness and achieve further economic growth, Connecticut will need to maintain and modernize its roads, highways and bridges by improving the physical condition of its transportation network and enhancing the system's ability to provide efficient, reliable and safe mobility for residents, visitors and businesses. Making needed improvements to Connecticut's roads, highways, bridges and transit systems could also provide a significant boost to the state's economy by creating jobs in the short term and stimulating long term economic growth as a result of enhanced mobility and access.

This report examines the condition, use and safety of Connecticut's roads, highways and bridges, funding needs, and the future mobility needs of the state. Sources of information for this report include the Connecticut Department of Transportation (ConnDOT), the Federal Highway Administration (FHWA), the American Association of State Highway and Transportation Officials (AASHTO), the Bureau of Transportation Statistics (BTS), the U.S.

Census Bureau, the Texas Transportation Institute (TTI), and the National Highway Traffic Safety Administration (NHTSA).

## **Population, Travel and Economic Trends in Connecticut**

Connecticut residents and businesses require a high level of personal and commercial mobility. Population increases and economic growth in the state have resulted in an increase in the demand for mobility as well as an increase in vehicle miles of travel (VMT). To foster quality of life and spur continued economic growth in Connecticut, it will be critical that the state provide a safe and modern transportation system that can accommodate future growth in population, tourism, business, recreation and vehicle travel.

Connecticut's population grew to approximately 3.6 million residents in 2014, a nine percent increase since 1990.<sup>1</sup> Connecticut had 2.5 million licensed drivers in 2013.<sup>2</sup>

From 1990 to 2013, annual VMT in Connecticut increased by 18 percent, from 26.3 billion miles traveled annually to 30.9 billion miles traveled annually.<sup>3</sup> Based on population and other lifestyle trends, TRIP estimates that travel on Connecticut's roads and highways will increase by another 15 percent by 2030.<sup>4</sup>

From 1990 to 2013, Connecticut's gross domestic product (GDP), a measure of the state's economic output, increased by 41 percent, when adjusted for inflation.<sup>5</sup> U.S. GDP increased 65 percent during this time.<sup>6</sup>

## Condition of Connecticut's Roads

The life cycle of Connecticut's roads is greatly affected by the state and local governments' ability to perform timely maintenance and upgrades to ensure that road and highway surfaces last as long as possible.

Thirty-three percent of Connecticut's major, locally and state-maintained urban roads and highways have pavements rated in poor condition.<sup>7</sup> Another 46 percent of Connecticut's major urban roads are rated in mediocre or fair condition and the remaining 21 percent are rated in good condition.<sup>8</sup>

Twenty-five percent of Connecticut's major, locally and state-maintained rural roads and highways have pavements rated in poor condition.<sup>9</sup> Another 48 percent of Connecticut's major rural roads are rated in mediocre or fair condition and the remaining 27 percent are rated in good condition.<sup>10</sup>

The chart below details pavement conditions on major urban roads in the Bridgeport/Stamford, Hartford and New Haven urban areas.<sup>11</sup>

**Chart 1. Pavement conditions on major roads.**

<b>Location</b>	<b>Poor</b>	<b>Mediocre</b>	<b>Fair</b>	<b>Good</b>
<b>Bridgeport/Stamford</b>	44%	30%	14%	12%
<b>Hartford</b>	37%	35%	15%	13%
<b>New Haven</b>	45%	30%	10%	15%

**Source: Federal Highway Administration.**

The pavement data in this report for all arterial roads and highways is provided by the Federal Highway Administration, based on data submitted annually by the Connecticut

Department of Transportation on the condition of major state and locally maintained roads and highways in the state.

Pavement failure 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>12</sup> As roads and highways continue to age, they will reach a point of deterioration where routine paving and maintenance will not be adequate to keep pavement surfaces in good condition and costly reconstruction of the roadway and its underlying surfaces will become necessary.

### **The Costs to Motorists of Roads in Inadequate Condition**

TRIP has calculated the additional cost to motorists of driving on roads in poor or unacceptable condition. When roads are in poor condition – which may include potholes, rutting or rough surfaces – the cost to operate and maintain a vehicle increases. These additional vehicle operating costs include accelerated vehicle depreciation, additional vehicle repair costs, increased fuel consumption and increased tire wear. TRIP estimates that additional vehicle operating costs (VOC) borne by Connecticut motorists as a result of poor road conditions is \$1.6 billion annually.<sup>13</sup>

The chart below details per-driver vehicle operating costs in the Bridgeport/Stamford, Hartford and New Haven urban areas and statewide.

**Chart 2. Annual per-driver vehicle operating costs due to rough roads and statewide total cost.**

<b>Location</b>	<b>VOC</b>
<b>Bridgeport/Stamford</b>	\$701
<b>Hartford</b>	\$654
<b>New Haven</b>	\$707
<b>Connecticut</b>	<b>\$1.6 Billion</b>

**Source: TRIP estimate.**

Additional vehicle operating costs have been calculated in the Highway Development and Management Model (HDM), which is recognized by the U.S. Department of Transportation and more than 100 other countries as the definitive analysis of the impact of road conditions on vehicle operating costs. The HDM report is based on numerous studies that have measured the impact of various factors, including road conditions, on vehicle operating costs.<sup>14</sup>

The HDM study found that road deterioration increases ownership, repair, fuel and tire costs. The report found that deteriorated roads accelerate the pace of depreciation of vehicles and the need for repairs because the stress on the vehicle increases in proportion to the level of roughness of the pavement surface. Similarly, tire wear and fuel consumption increase as roads deteriorate since there is less efficient transfer of power to the drive train and additional friction between the road and the tires.

TRIP's additional vehicle operating cost estimate is based on taking the average number of miles driven annually by a motorist, calculating current vehicle operating costs based on AAA's 2014 vehicle operating costs and then using the HDM model to estimate the additional vehicle operating costs paid by drivers as a result of substandard roads.<sup>15</sup> Additional research on the impact of road conditions on fuel consumption by the Connecticut Transportation Institute (TTI) is also factored into TRIP's vehicle operating cost methodology.

## Bridge Conditions in Connecticut

Connecticut’s bridges form key links in the state’s highway system, providing communities and individuals access to employment, schools, shopping and medical facilities, and facilitating commerce and access for emergency vehicles.

More than one-third of Connecticut’s locally and state- maintained bridges (20 feet or longer) are currently rated as structurally deficient or functionally obsolete.

Nine percent of Connecticut’s locally and state maintained bridges are rated as structurally deficient.<sup>16</sup> A bridge is structurally deficient if there is significant deterioration of the bridge deck, supports or other major components. Bridges that are structurally deficient may be posted for lower weight limits or closed if their condition warrants such action. Deteriorated bridges can have a significant impact on daily life. Restrictions on vehicle weight may cause many vehicles – especially emergency vehicles, commercial trucks, school buses and farm equipment – to use alternate routes to avoid posted bridges. Redirected trips also lengthen travel time, waste fuel and reduce the efficiency of the local economy.

Twenty-six percent of Connecticut’s locally and state maintained bridges are rated functionally obsolete.<sup>17</sup> Bridges that are functionally obsolete no longer meet current highway design standards, often because of narrow lanes, inadequate clearances or poor alignment with the approaching roadway.

**Chart 3. Bridge Conditions in Connecticut’s Largest Urban Areas.**

	Structurally Deficient Number	Structurally Deficient Percentage	Functionally Obsolete Number	Functionally Obsolete Percentage	Total Bridges
Bridgeport-Stamford	90	11%	338	41%	832
Hartford	81	9%	203	23%	898
New Haven	64	7%	300	34%	873

**Source: National Bridge Inventory, Federal Highway Administration. 2014.**

The service life of bridges can be extended by performing routine maintenance such as resurfacing decks, painting surfaces, insuring that a facility has good drainage and replacing deteriorating components. But, most bridges will eventually require more costly reconstruction or major rehabilitation to remain operable.

### **Traffic Safety in Connecticut**

A total of 1,274 people were killed in motor vehicle crashes in Connecticut from 2009 through 2013, an average of 255 fatalities per year.<sup>18</sup>

**Chart 4. Traffic Fatalities in Connecticut from 2009 – 2013.**

<i>Year</i>	<i>Fatalities</i>
2009	223
2010	319
2011	220
2012	236
2013	276
<b>Total</b>	<b>1,274</b>

**Source: National Highway Traffic Safety Administration.**

Three major factors are associated with fatal vehicle crashes: driver behavior, vehicle characteristics and roadway features. It is estimated that roadway features are likely a contributing factor in approximately one-third of fatal traffic crashes. Roadway features that impact safety include the number of lanes, lane widths, lighting, lane markings, rumble strips, shoulders, guard rails, other shielding devices, median barriers and intersection design.

Connecticut's overall traffic fatality rate of 0.89 fatalities per 100 million vehicle miles of travel in 2013 is lower than the national average of 1.09.<sup>19</sup>

Improving safety on Connecticut's roadways can be achieved through further improvements in vehicle safety; improvements in driver, pedestrian, and bicyclist behavior; and a variety of improvements in roadway safety features.

The severity of serious traffic crashes could be reduced through roadway improvements, where appropriate, such as adding turn lanes, removing or shielding obstacles, adding or improving medians, widening lanes, widening and paving shoulders, improving intersection layout, and providing better road markings and upgrading or installing traffic signals.

Roads with poor geometry, with insufficient clear distances, without turn lanes, having inadequate shoulders for the posted speed limits, or poorly laid out intersections or interchanges, pose greater risks to motorists, pedestrians and bicyclists.

Investments in rural traffic safety have been found to result in significant reductions in serious traffic crashes. A 2012 report by TTI found that improvements completed recently by TxDOT that widened lanes, improved shoulders and made other safety improvements on 1,159 miles of rural state roadways resulted in 133 fewer fatalities on these roads in the first three years after the improvements were completed (as compared to the three years prior).<sup>20</sup> TTI estimates that the improvements on these roads are likely to save 880 lives over the next 20 years.<sup>21</sup>

## **Traffic Congestion in Connecticut**

Increasing levels of traffic congestion cause significant delays in Connecticut, particularly in its larger urban areas, choking commuting and commerce. Traffic congestion robs

commuters of time and money and imposes increased costs on businesses, shippers and manufacturers, which are often passed along to the consumer.

According to TTI estimates, the value of lost time and wasted fuel in Connecticut is approximately \$2.3 billion per year.

The chart below details the cost of congestion in the form of lost time and wasted fuel, and the number of hours lost to congestion by the average commuter in the state's largest urban areas.

**Chart 5. Cost of congestion and hours lost annually.**

<b>Location</b>	<b>Hours Lost</b>	<b>Congestion Cost</b>
<b>Bridgeport/Stamford</b>	<b>49</b>	<b>\$1,174</b>
<b>Hartford</b>	<b>45</b>	<b>\$1,038</b>
<b>New Haven</b>	<b>40</b>	<b>\$932</b>

**Source: Texas Transportation Institute Urban Mobility Report, 2015.**

Increasing levels of congestion add significant costs to consumers, transportation companies, manufacturers, distributors and wholesalers. Increased levels of congestion can reduce the attractiveness of a location to a company when considering expansion or where to locate a new facility. Congestion costs can also increase overall operating costs for trucking and shipping companies, leading to revenue losses, lower pay for employees, and higher consumer costs.

Transportation congestion is impacting the productivity of businesses in Connecticut. Forty-two percent of businesses surveyed by the Connecticut Business and Industry Association believe that the state's road congestion restricts or limits the territory of their market.<sup>22</sup> Fifteen percent of businesses surveyed by the Connecticut Business and Industry Association have considered relocation because of regional transportation concerns.<sup>23</sup>

## **Transit in Connecticut**

Connecticut's heavily traveled and aging transit system plays a vital role in the state, providing access to employment, education, healthcare, shopping, entertainment and social activities. The state's transit system provides mobility on some of the most heavily traveled corridors in the state and serves as an important resource for people who do not have access to private transportation.

Connecticut's transit system includes 20 urban and rural systems, including the CTfastrack Bus Rapid Transit line in Hartford and the New Haven Line, the nation's busiest commuter rail corridor. Transit in Connecticut provides 42 million bus passenger trips per year on 1,100 buses and paratransit vehicles, and 41 million rail passenger trips per year on 500 rail cars and coaches that travel on the system's 226 route miles.<sup>24</sup>

The state's transit system has significant preservation needs to replace aging vehicles and to upgrade aging rail lines and bridges. The preservation needs for Connecticut's bus transit system totals \$2 billion, while the preservation need for the state's rail transit system is \$14.5 billion.<sup>25</sup>

The average age of state-maintained buses in Connecticut is seven years, while the average age of buses maintained by local transit agencies is nine years.<sup>26</sup> The average service life of a bus is 12 years.<sup>27</sup> Connecticut is also faced with significant deterioration of its rail transit system. Nearly a quarter of the 203 bridges which carries the New Haven Line as well as additional freight traffic are deficient, with twenty-two percent of the bridges being rated in poor condition.<sup>28</sup>

## Transportation Funding

Investment in Connecticut's roads, highways and bridges is funded by local, state and federal governments. A lack of sufficient funding at all levels will make it difficult to adequately maintain and improve the existing transportation system.

The federal government is a critical source of funding for Connecticut's roads, highways, bridges and transit systems and provides a significant return to Connecticut in road and bridge funding based on the revenue generated in the state by the federal motor fuel tax. From 2009 to 2013, the federal government provided \$1.75 for road improvements in Connecticut for every dollar that motorists in the state paid in federal motor fuel fees.<sup>29</sup>

Federal funds for highway and transit improvements in Connecticut are provided through the federal Highway Trust Fund (HTF), which raises revenue through federal user fees, largely an 18.4 cents-per-gallon tax on gasoline and a 24.4 cents-per-gallon tax on diesel fuel. Since 2008 revenue into the federal Highway Trust Fund has been inadequate to support legislatively set funding levels so Congress has transferred approximately \$53 billion in general funds and an additional \$2 billion from a related trust fund into the federal Highway Trust Fund.<sup>30</sup>

Signed into law in July 2012, MAP-21 (Moving Ahead for Progress in the 21<sup>st</sup> Century Act), has improved several procedures that in the past had delayed projects. MAP-21 does not address long-term funding challenges facing the federal surface transportation program. The current federal transportation legislation was initially set to expire on September 30, 2014. However, following several short-term extensions passed by Congress, the bill is currently set to expire on December 4, 2015. Congress will need to pass new legislation prior to the extension expiration to ensure prompt federal reimbursements to states for road, highway, bridge and

transit repairs and improvements.

If Congress decides to provide additional revenues into the federal Highway Trust Fund in tandem with authorizing a new federal surface transportation program, a number of technically feasible revenue options have been identified by the [American Association of State Highway and Transportation Officials](#).

A significant boost in investment on the nation's roads, highways, bridges and public transit systems is needed to improve their condition and to meet the nation's transportation needs, concluded a new report from the American Association of State Highway and Transportation Officials. The [2015 AASHTO Transportation Bottom Line Report](#) found that annual investment in the nation's roads, highways and bridges needs to increase from \$88 billion to \$120 billion and from \$17 billion to \$43 billion in the nation's public transit systems, to improve conditions and meet the nation's mobility needs.<sup>31</sup>

The [2015 AASHTO Transportation Bottom Line Report](#) also found that the current backlog in needed road, highway and bridge improvements is \$740 billion.<sup>32</sup> The backlog includes a \$392 billion backlog for road and highway rehabilitation, a \$112 billion backlog in needed bridge rehabilitation and a \$237 billion backlog in needed highway capacity additions.<sup>33</sup>

## **Importance of Transportation to Economic Growth**

Today's culture of business demands that an area have well-maintained and efficient roads, highways and bridges if it is to remain economically competitive. Global communications and the impact of free trade in North America and elsewhere have resulted in a significant

increase in freight movement, making the quality of a region's transportation system a key component in a business's ability to compete locally, nationally and internationally.

Businesses have responded to improved communications and the need to cut costs with a variety of innovations including just-in-time delivery, increased small package delivery, demand-side inventory management and e-commerce. The result of these changes has been a significant improvement in logistics efficiency as firms move 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. These improvements have made mobile inventories the norm, resulting in the nation's trucks literally becoming rolling warehouses.

Highways are vitally important to continued economic development in Connecticut, particularly to the state's manufacturing, mineral extraction and tourism industries. As the economy expands, creating more jobs and increasing consumer confidence, the demand for consumer and business products grows. In turn, manufacturers ship greater quantities of goods to market to meet this demand, a process that adds to truck traffic on the state's highways and major arterial roads.

Every year, \$143 billion in goods are shipped from sites in Connecticut and another \$119 billion in goods are shipped to sites in Connecticut, mostly by trucks.<sup>34</sup> Seventy-three percent of the goods shipped annually from sites in Colorado are carried by trucks and another 18 percent are carried by courier services or multiple-mode deliveries, which include trucking.<sup>35</sup>

The cost of road and bridge improvements are more than offset by the reduction of user costs associated with driving on rough roads, the improvement in business productivity, the reduction in delays and the improvement in traffic safety. The [Federal Highway Administration estimates](#) that each dollar spent on road, highway and bridge improvements results in an average benefit of \$5.20 in the form of reduced vehicle maintenance costs, reduced delays, reduced fuel

consumption, improved safety, reduced road and bridge maintenance costs and reduced emissions as a result of improved traffic flow.<sup>36</sup>

Local, regional and state economic performance is improved when a region's surface transportation system is expanded or repaired. This improvement comes as a result of the initial job creation and increased employment created over the long-term because of improved access, reduced transport costs and improved safety.

Increasingly, companies are looking at the quality of a region's transportation system when deciding where to re-locate or expand. Regions with congested or poorly maintained roads may see businesses relocate to areas with a smoother, more efficient and more modern transportation system. In fact, highway accessibility was ranked the number two site selection factor behind only the availability of skilled labor in a 2013 survey of corporate executives by [Area Development Magazine](#).<sup>37</sup>

## **Conclusion**

As Connecticut works to build and enhance a thriving, growing and dynamic state, it will be critical that it is able to address the state's most significant transportation issues by providing a 21<sup>st</sup> century network of roads, highways and bridges that can accommodate the mobility demands of a modern society.

The state will need to modernize its surface transportation system by improving the physical condition of its transportation network and enhancing the system's ability to provide efficient and reliable mobility for residents, visitors and businesses. Making needed improvements to Connecticut's roads, highways, bridges and transit systems could provide a

significant boost to the state's economy by creating jobs in the short term and stimulating long-term economic growth as a result of enhanced mobility and access.

Without a substantial boost in transportation funding, numerous projects to improve the condition and expand the capacity of Connecticut's roads, highways, bridges and transit systems will not be able to proceed, hampering the state's ability to improve the condition of its transportation system and to enhance economic development opportunities and quality of life in the state.

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## Endnotes

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- <sup>2</sup> Highway Statistics (2013). Federal Highway Administration. DL-1C
- <sup>3</sup> U.S. Department of Transportation - Federal Highway Administration: Highway Statistics 1990 and 2013.
- <sup>4</sup> TRIP calculation based on U.S. Census and Federal Highway Administration data.
- <sup>5</sup> TRIP analysis of Bureau of Economic Analysis data.
- <sup>6</sup> Ibid.
- <sup>7</sup> Federal Highway Administration (2015). Pavement condition data is for 2013.
- <sup>8</sup> Ibid.
- <sup>9</sup> Federal Highway Administration (2015). Pavement condition data is for 2013.
- <sup>10</sup> Ibid.
- <sup>11</sup> Federal Highway Administration (2015). Pavement condition data is for 2013.
- <sup>12</sup> Selecting a Preventative Maintenance Treatment for Flexible Pavements. R. Hicks, J. Moulthrop. Transportation Research Board. 1999. Figure 1.
- <sup>13</sup> TRIP calculation
- <sup>14</sup> Highway Development and Management: Volume Seven. Modeling Road User and Environmental Effects in HDM-4. Bennett, C. and Greenwood, I. 2000.
- <sup>15</sup> Your Driving Costs. American Automobile Association. 2014.
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- <sup>17</sup> Ibid.
- <sup>18</sup> National Highway Traffic Safety Administration data.
- <sup>19</sup> TRIP analysis of National Highway Traffic Safety Administration and Federal Highway Administration data (2014).
- <sup>20</sup> Adding Highway Shoulders, Width, Reduce Crash Numbers and Save Lives (August 9, 2012). Connecticut Transportation Institute.
- <sup>21</sup> Ibid.
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- <sup>23</sup> Ibid.
- <sup>24</sup> Connecticut's Bold Vision and Call to Action for a Transportation Future (2015). P. 6.
- <sup>25</sup> Ibid. P. 49.
- <sup>26</sup> Rail Bridge Conditions and Needs of New Haven Line (2015). P. 8.
- <sup>27</sup> Ibid.
- <sup>28</sup> Ibid.
- <sup>29</sup> TRIP analysis of Federal Highway Administration data. 2009 to 2013 Highway Statistics fe-221.
- <sup>30</sup> "Surface Transportation Reauthorization and the Solvency of the Highway Trust Fund," presentation by Jim Tyson, American Association of State Highway and Transportation Officials (2014).
- <sup>31</sup> 2015 AASHTO Bottom Line Report (2014) AASHTO. P. 2.
- <sup>32</sup> 2015 AASHTO Bottom Line Report (2014) AASHTO. P. 3.
- <sup>33</sup> Ibid.
- <sup>34</sup> Bureau of Transportation Statistics (2010), U.S. Department of Transportation. 2007 Commodity Flow Survey, State Summaries. [http://www.bts.gov/publications/commodity\\_flow\\_survey/2007/states/](http://www.bts.gov/publications/commodity_flow_survey/2007/states/)
- <sup>35</sup> Ibid.
- <sup>36</sup> FHWA estimate based on its analysis of 2006 data. For more information on FHWA's cost-benefit analysis of highway investment, see the 2008 Status of the Nation's Highways, Bridges, and Transit: Conditions and Performance.
- <sup>37</sup> Area Development Magazine (2014). 28th Annual Survey of Corporate Executives: Availability of Skilled Labor New Top Priority. . <http://www.areadevelopment.com/Corporate-Consultants-Survey-Results/Q1-2014/28th-Corporate-Executive-RE-survey-results-6574981.shtml?Page=2>