PRESERVING CONNECTICUT'S HIGHWAYS AND BRIDGES:

The State's Challenge in Maintaining its Aging system of Roads, Highways and Bridges

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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 sponsored 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

Connecticut's extensive system of roads, highways and bridges is aging and overburdened, presenting the state with a challenge in preserving and maintaining the system, at a time when sufficient funds are not available to fully address needed repairs.

It is critical that Connecticut accelerates its efforts to preserve and maintain its system of roads, highways and bridges at a time when travel continues to increase in the state, increasing the amount of wear and tear on the system. Improving the condition of the state's roads, highways and bridges as well as modernizing these key transportation links in the state is critical to providing the state's residents with a high quality of life and accommodating future population and economic growth in Connecticut.

Connecticut faces a $3.1 billion shortfall from 2008 to 2017 in funding needed to improve road, highway and bridge conditions in the state. This shortfall is exacerbated by increasing highway construction costs.

- According to the Connecticut Department of Transportation (CDOT), from 2008 to 2017, $10.6 billion is needed to repair, maintain and expand the state's roads, highways and bridges to accommodate growing traffic levels. However, CDOT estimates that only $7.5 billion will be available for road, highway and bridge repairs and improvements during this period, leaving a shortfall of approximately $3.1 billion.

- Because of a lack of adequate funding in the state, numerous projects to repair and modernize the state's road, highway and bridge system are currently unfunded. These projects include the reconstruction and modernizing of numerous key road, highway and bridge links in the state.

- Needed roadway reconstruction or modernization projects that lack adequate funding to proceed include the following: the reconstruction of I-95 from Branford to the Rhode Island state line, the modernization of portions of Interstate 84 in Waterbury, improvements to the interchange of Interstate 84 and Connecticut Route 4 in Farmington and the widening of a portion of Route 6 in Danbury. A list of other roadway reconstruction or modernization projects that lack adequate funding to proceed is included in the report.

- Bridges that are in need of significant reconstruction, for which adequate funding is not available, include: I-84 bridge over Park River in Hartford; I-95 bridge over the Housatonic River in Stratford; the I-84/Connecticut Route 8 interchange in Waterbury and the CT 2A bridge over the Thames River in Preston. A list of other needed, but unfunded bridge projects is included in the report.

- The cost of roadway improvements is escalating because the price of key materials needed for highway and bridge construction has increased rapidly. Over the last three years, the average cost of materials used for highway construction, including asphalt, concrete, steel, and diesel has increased by 43 percent.

Nearly half – 48 percent -- of major roads in Connecticut are in poor and mediocre condition, providing motorists with a rough ride.

- In 2005 (the latest year for which data is available), 14 percent of Connecticut's roads were rated in poor condition and 34 percent were rated in mediocre condition.
- Roads rated poor may show signs of deterioration, including rutting, cracks and potholes. Roads rated in mediocre condition may 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.
- Roads in need of repair cost each Connecticut motorist an average of $325 annually in extra vehicle operating costs - $892 million state-wide. These costs include accelerated vehicle depreciation, additional vehicle repair costs, increased fuel consumption and increased tire wear.
- A desirable goal for state and local organizations that are responsible for road maintenance is to have 75 percent of major roads in good condition. Only 33 percent of Connecticut's major roads are in good condition.
- The share of the state's major roads that are in need of significant repairs or reconstruction is anticipated to double by 2017 at the current rate of state spending on highway repairs.
- Currently, 15 percent of the state's major roads are in need of significant repairs or reconstruction, but this share is expected to increase to 45 percent by 2017 under current investment levels.
- The following is a list of the ten sections of heavily traveled roads in Connecticut with the most deteriorated pavement condition. A list of the 50 sections of Connecticut's heavily traveled roadways with the worst pavement conditions is in the body of the report.

Rank	TOWN	Local Road Naming	From	To	Traffic
1	HARTFORD	Albany Ave.	Rte 189-Bloomfield Ave.	Overpass I-84	18,000
2	STAMFORD	Tresser Blvd	US 1-Tresser Blvd	Clarks Hill Ave	24,100
3	STAMFORD	East Main St	Clarks Hill Ave	Overpass Noroton River	20,700
4	GREENWICH	West Putnam Ave	200ft North of Riverside Ave	US 1-West Main St/Greenwich-Stamford TL	19,400
5	BRIDGEPORT	Fairfield Ave	Rte 130 (Stratford Ave & Water St)	Fairfield Ave. and State St.	11,000
6	FAIRFIELD	Kings Highway Cutoff	End Overpass Metro North	NB Underpass I-95/SB-SR 732 (NB)	15,300
7	ENFIELD	Hazard Ave	Rte 192 (North Maple St)	Rte 191 (Broad Brook Rd) (SB)	17,000
8	NORWALK	Connecticut Ave	Acc to SB I-95	US 1-Westport Ave/Rte 53 East Ave	17,900
9	BRIDGEPORT	Fairfield Ave/ Penn Memorial Hwy	400ft East of Orlando St	Lafayette Blvd (SB)	10,500
10	ORANGE	Boston Post Rd	Milford-Orange TL	500ft South of Rte 114 (Racebrook Rd)	21,500

One-third – 34 percent - of bridges in Connecticut show significant deterioration or do not meet current design standards.

- Nine percent of Connecticut's bridges were structurally deficient in 2007. 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-five percent of Connecticut's bridges were functionally obsolete in 2006. Bridges that are functionally obsolete no longer meet current highway design standards, often because of narrow lanes, inadequate clearances or poor alignment.
- The number of state-maintained bridges that are deficient is increasing, rising from 148 bridges rated deficient in 1998 to 240 bridges rated deficient by CDOT in 2006.
- The average age of bridges in Connecticut is 40 years. Forty-six percent of the state's bridges were built prior to 1960.
- Bridges on average require significant repairs or rehabilitation when they reach 50 years in service.
- The following is a list of the ten most structurally deficient bridges in Connecticut, carrying at least 5,000 vehicles per day. A list of the 40 most heavily traveled structurally deficient bridges is included in the report. Bridges have been rated by level of deficiency.

				Average	Year	Deck	Superstructure	Substructure
	Route Carried	County/Closest City	Route or feature intersected	Daily Traffic	Built	Rating	Rating	Rating
1	CONGRESS STREET	BRIDGEPORT	PEQUONNOCK RIVER	10,900	1909	0	0	0
2	TEMPLE STREET	NEW HAVEN	CANAL LINE	13,300	1900	3	3	6
3	CAPITAL AVENUE	BRIDGEPORT	ROOSTER RVR OVERFLOW	11,850	1907	4	3	5
4	ROUTE 66	MIDDLETOWN	P&W RR RT9 CONN RVR	33,200	1938	4	4	4
5	ROUTE 71	MERIDEN	SODOM BROOK	17,700	1930	5	4	4
6	ROUTE 67	SEYMOUR	LITTLE RIVER	20,400	1950	7	4	5
7	INTERSTATE-84 EB	WATERBURY	I-84WB,ROUTE 8,	35,850	1967	4	4	5
8	INTERSTATE-84 WB	NEWTOWN	CENTER STREET	35,600	1977	7	4	7
9	US ROUTE 1	EAST LYME	NIANTIC RIVER	10,000	1926	6	5	4
10	ROUTE 154	HADDAM	CANDLEWOOD HILL BRK	7,300	1928	6	6	4

The efficiency of Connecticut's transportation system, particularly its highways, is critical to the health of the state's economy. Businesses are increasingly reliant on an efficient and reliable 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.

- Every year, $75 billion in goods are shipped annually from sites in Connecticut and another $82 billion in goods are shipped annually to sites in Connecticut, mostly by truck.
- Seventy-four percent of the goods shipped annually from sites in Connecticut are carried by trucks and another 18 percent are carried by courier services, which use trucks for part of the deliveries. Similarly, 75 percent of the goods shipped to sites in Connecticut are carried by trucks and another 21 percent are carried by courier services, which use trucks for part of their deliveries.

- 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 transportation system.
- 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.

Improving the condition of Connecticut's roads, highways and bridges will be made more challenging by the continued and forecast increase in vehicle travel, particularly by large trucks, which put significant wear and tear on the state's key transportation links.

- Connecticut's population reached 3.5 million in 2006, an increase of seven percent since 1990. Connecticut's population is projected to increase to approximately 3.7 million residents by 2025.

- Travel in Connecticut increased by 20 percent from 1990 to 2005 – jumping from 26 billion vehicle miles traveled (VMT) in 1990 to 32 billion VMT in 2005.

- By 2025, vehicle travel in Connecticut is projected to increase by 30 percent, to nearly 42 billion vehicle miles of travel.

- Commercial trucking in Connecticut is projected to increase 48 percent by 2020, placing even greater stress on the state's already overburdened highways and bridges.

Introduction

Connecticut's system of roads, highways and bridges is the most critical transportation link for the state's residents and visitors, providing access to homes, employment, shopping and recreation. Today, with population and travel continuing to increase in the state, the continued preservation of Connecticut's roads, highways and bridges is crucial to providing a safer, more efficient transportation system, while improving the economic livelihood of the state and accommodating future growth. However, the state's transportation system is aging and overburdened, presenting Connecticut with a challenge in repairing and maintaining the system, at a time when sufficient funds are not available to address needed transportation projects.

This report examines the condition, use and funding of Connecticut's roads and bridges, as well as the state's ability to maintain and preserve the existing system. Sources of information for this study include the U.S. Department of Transportation, the Connecticut Department of Transportation (CDOT), the Federal Highway Administration (FHWA), the U.S. Census Bureau, the National Highway Traffic Safety Administration (NHTSA), AAA, and the Bureau of Transportation Statistics (BTS).

Population and Travel Trends in Connecticut

Connecticut residents rely on a high level of personal and commercial mobility. Continued growth in the state's population and an increase in the miles traveled by the state's residents and visitors have created growing demand on Connecticut's key highways and roads. It is critical that Connecticut provide and maintain a modern transportation system that can accommodate future growth in population, tourism, vehicle travel and economic development.

Connecticut's population increased by seven percent since 1990, reaching approximately 3.5 million residents in 2006.[1] The population of Connecticut is projected to increase to 3.7 million residents by 2025.[2]

Steady economic growth and population growth have contributed to a significant increase in vehicle travel in the state. From 1990 to 2005, annual vehicle miles of travel in Connecticut increased by 20 percent, from 26 billion annual miles of travel to 32 billion miles of travel.[3] Based on population and other lifestyle trends, TRIP estimates that travel on Connecticut's roads and highways will increase by 30 percent by 2025, to nearly 42 billion vehicle miles of travel.

Condition of Connecticut's Roads

In 2005 (the latest year for which data is available), nearly half of Connecticut's major roads were rated in poor or mediocre condition, providing motorists with a rough ride.[4] Fourteen percent of Connecticut's major roads were rated in poor condition and 34 percent were rated in mediocre condition.[5] Roads rated poor may show signs of deterioration, including rutting, cracks and potholes. In some cases, poor roads can be resurfaced, but often are too deteriorated and must be reconstructed. Roads rated in mediocre condition may 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.

The life cycle of Connecticut's roads is greatly affected by the state's ability to perform timely maintenance and upgrades to ensure that road and highway surfaces last as long as possible. The pavement condition of the state's major roads is 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.[6] In Connecticut, 33 percent of the state's major roads were in good condition in 2005.[7]

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.[8]

The share of the state's major roads that are in need of significant repairs or reconstruction is anticipated to double by 2017 at the current rate of state spending on highway repairs. Currently, 15 percent of the state's major roads are in need of significant repairs or reconstruction, but this share is expected to increase to 45 percent by 2017 under current investment levels.[9]

The Connecticut Department of Transportation has identified the 50-most deteriorated sections of state roadways carrying at least 5,000 vehicles per day that are in immediate need of repair. [10]

Chart 1. Heavily traveled sections of roads and highways in Connecticut that have significant pavement deterioration and are in need of repair.

Rank	TOWN	Local Road Naming	From	To	Traffic
1	HARTFORD	Albany Ave.	Rte 189-Bloomfield Ave.	Overpass I-84	18,000
2	STAMFORD	Tresser Blvd	US 1-Tresser Blvd	Clarks Hill Ave	24,100
3	STAMFORD	East Main St	Clarks Hill Ave	Overpass Noroton River	20,700
4	GREENWICH	West Putnam Ave	200ft North of Riverside Ave	US 1-West Main St/Greenwich-Stamford TL	19,400
5	BRIDGEPORT	Fairfield Ave	Rte 130 (Stratford Ave & Water St)	Fairfield Ave. and State St.	11,000
6	FAIRFIELD	Kings Highway Cutoff	End Overpass Metro North	NB Underpass I-95/SB-SR 732 (NB)	15,300
7	ENFIELD	Hazard Ave	Rte 192 (North Maple St)	Rte 191 (Broad Brook Rd) (SB)	17,000
8	NORWALK	Connecticut Ave	Acc to SB I-95	US 1-Westport Ave/Rte 53 East Ave	17,900
9	BRIDGEPORT	Fairfield Ave/ Penn Memorial Hwy	400ft East of Orlando St	Lafayette Blvd (SB)	10,500
10	ORANGE	Boston Post Rd	Milford-Orange TL	500ft South of Rte 114 (Racebrook Rd)	21,500
11	WINDHAM	Main St	Rte 32 NB (Main St)	SR 661(Thread City Crossing)/Jackson St	16,900
12	COLCHESTER	New London Rd/Governor's Rd	SR 637 (Lake Hayward Rd)	South Jct Rte 16 (Linwood Ave)	10,400
13	WEST HAVEN	Boston Post Rd	250ft North of Overpass Cove River	US 1-Orange Ave/WestHaven-New Haven TL	22,300
14	NORTH HAVEN	Davis St	Hamden-North Haven TL	W Jct US 5 (State St)	9,900
15	WATERTOWN	Main St	Rte 73 (Main St)	US 6 (Cutler St & DeForest St)	17,300
16	ENFIELD	Hazard Ave	W Jct Middle Rd (SB)	Rte 192 (North Maple St)	21,300
17	WESTPORT	Post Rd East	350ft N. of Saugatuck River Overpass	650ft North of Sherwood Island Con.	23,000
18	GREENWICH	West Putnam Ave	Indian Field Rd	End Overpass Mianus River	21,900
19	WILTON	Norwalk Danbury Rd/Ethan Allen Hwy	Norwalk-Wilton TL	150ft North of SB US 7	26,600
20	EAST HAVEN	Foxon Blvd	Rte 103 (Quinnipiac Ave)	200ft East of Green ST	26,300
21	VERNON	Union St	Rte 83 (West St) & SR 527 (West St)	Rte 31 (Grove St)	10,600
22	EAST WINDSOR	Prospect Hill Rd/Purple Heart	Acc to NB I-91	Rte 140 (North Rd/Bridge St)	10,100
23	WEST HARTFORD	Albany Tpke/Jonathan Trumbull Hwy	Rte 218 (North Main St)	West Hartford-Hartford TL	15,300
24	GROTON	Long Hill Rd	100ft North of SB-Acc to Rte 349 NB	SR 649 (South Rd)	19,600
25	SOUTH WINDSOR	Sullivan Ave	US 5 (John Fitch Blvd) /Sullivan Ave	Overpass Podunk River	11,000
26	EAST HARTFORD	Burnside Ave/Jonathan Trumbull Hwy	250ft West of Hillside St	Long Hill Dr	13,200
27	CANTON	Albany Tpke/Jonathan Trumbull Hwy	Rte 177 (Lovely St)	Canton-Simsbury TL	25,600
28	MANCHESTER	Main St	100ft North of US 6 & Center St.	Conrail RRX2 (Sign) (Light & Gate)	15,300
29	MANSFIELD	Storrs Rd/UCONN Husky Way	Windham-Mansfield TL	1.08 Miles South of Bassetts Bridge Rd	14,000
30	EAST HARTFORD	Burnside Ave/Jonathan Trumbull Hwy	US 5 & US 44	250ft West of Hillside St	11,200
31	NEW LONDON	Niles Hill Rd	Waterford-New London TL	500ft South School St	6,400
32	SOUTHINGTON	QueenSt	250ft North of Curtiss St	100ft North of River St	25,200
33	FAIRFIELD	Black Rock Tpke	Kings Hwy Cutoff	Rte 58 (Tunxis Hill Cutoff & Black Rock Tpke)	12,800
34	CLINTON	West Main St	Madison-Clinton TL/Hammonasset Rvr.	Rte 81 (Hull St)	9,400
35	ENFIELD	Elm St	US 5 (Enfield St)	Rte 192 (North Maple St)	18,500
36	WILTON	Norwalk Danbury Rd/Ethan Allen Hwy	Olmstead Hill Rd	1,550ft South of Rte 107(SB) & School St.	18,000
37	STRATFORD	Lordship Blvd	Bridgeport-Stratford TL	South Jct Access Rd	16,100
38	PUTNAM	Woodstock Ave	Thompson-Putnam TL	US 44 (School St)	9,100
39	KILLINGLY	Main St	N Jct WB US 6	Rte 12-North Main St	9,800
40	BRIDGEPORT	East Main St	Rte 130 (Stratford Ave)	US 1 NB (Boston Ave)	8,100
41	NORWICH	Salem Tpke	WB-Acc to NB I-395	WB-Jct SR 646 (North Thames St)	21,100
42	WESTPORT	Post Rd West	Norwalk-Westport TL	350ft North of End Overpass Saugatuck River	16,400
43	BRIDGEPORT	Stratford Ave	200ft West of UP Exit NB I-95	Bridgeport-Stratford TL	13,400
44	OLD SAYBROOK	Oyster River	Rte 154(SB) (Old Boston Post Rd)	1200ft North of N Jct Rte 154 (Middlesex Tpke)	15,500
45	GUILFORD	Whitfield St	Rte 146 (Boston St & Whitfield St)	250ft North of Acc to SB I-95	8,800
46	FAIRFIELD	Kings Highway Cutoff	Underpass I-95/SR 732	US 1-North Ave/Fairfield-Bridgeport TL+E14	17,700
47	FARMINGTON	Farmington Ave	875ft East of South Rd.	1600ft East of Talcott Notch Rd	19,700
48	DARIEN	Boston Post Rd	Overpass Noroton River	Brookside Rd	11,800
49	ELLINGTON	Pinney Street	Rte 74-Wapping Wood Road	Tomoka Ave	19,700
50	NEW LONDON	Bank Street	SR 639-Colman Street	Beginning of Overlap with I-95	11,800

Source: Connecticut Department of Transportation

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 borne by Connecticut motorists as a result of poor road conditions is $892 million annually, or $325 per motorist.

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.[11]

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 region's driver, calculating current vehicle operating costs based on AAA's 2006 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.[12] Additional research on the impact of road conditions on fuel consumption by the Texas 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.

In 2007, a total of 34 percent of Connecticut's bridges (20 feet or longer) were rated as structurally deficient or functionally obsolete. Nine percent of Connecticut's bridges (20 feet or longer) were rated structurally deficient.[13] 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-five percent of Connecticut's bridges were rated functionally obsolete in 2006.[14] Bridges that are functionally obsolete no longer meet current highway design standards, often because of narrow lanes, inadequate clearances or poor alignment.

The number of state-maintained bridges classified as being in "poor" condition by ConnDOT has increased, rising from 148 bridges rated in poor condition in 1998 to 240 bridges rated in poor condition in 2006. A bridge is considered to be in poor condition if at least one of the major components (deck, superstructure, sub-structure, and/or culvert) has a rating of "four" on a scale of zero to nine (nine being the best).

Chart 2: Connecticut state-maintained bridges rated "poor".

Year	"Poor" Bridges
1998	148
1999	199
2000	190
2001	196
2002	194
2003	201
2004	226
2005	231
2006	240

Source: Connecticut Department of Transportation

The average age of bridges in Connecticut is 40 years. Forty-six percent of the state's bridges were built prior to 1960.[15] Bridges on average require significant repairs or rehabilitation when they reach 50 years in service.

The Connecticut Department of Transportation has identified the 40 most heavily traveled structurally deficient bridges in Connecticut (carrying at least 5,000 vehicles per day).[16]

Chart 3. The 40 most heavily-traveled structurally deficient bridges in Connecticut (carrying at least 5,000 vehicles per day).

				Average	Year	Deck	Superstructure	Substructure
	Route Carried	County/Closest City	Route or feature intersected	Daily Traffic	Built	Rating	Rating	Rating
1	CONGRESS STREET	BRIDGEPORT	PEQUONNOCK RIVER	10,900	1909	0	0	0
2	TEMPLE STREET	NEW HAVEN	CANAL LINE	13,300	1900	3	3	6
3	CAPITAL AVENUE	BRIDGEPORT	ROOSTER RVR OVERFLOW	11,850	1907	4	3	5
4	ROUTE 66	MIDDLETOWN	P&W RR RT9 CONN RVR	33,200	1938	4	4	4
5	ROUTE 71	MERIDEN	SODOM BROOK	17,700	1930	5	4	4
6	ROUTE 67	SEYMOUR	LITTLE RIVER	20,400	1950	7	4	5
7	INTERSTATE-84 EB	WATERBURY	I-84WB,ROUTE 8,	35,850	1967	4	4	5
8	INTERSTATE-84 WB	NEWTOWN	CENTER STREET	35,600	1977	7	4	7
9	US ROUTE 1	EAST LYME	NIANTIC RIVER	10,000	1926	6	5	4
10	ROUTE 154	HADDAM	CANDLEWOOD HILL BRK	7,300	1928	6	6	4
11	MAIN ST	EAST HAVEN	FARM RIVER	6,700	1900	N	4	4
12	US ROUTE 7	RIDGEFIELD	NORWALK RIVER	16,100	1928	4	4	5
13	PROSPECT STREET	NEW HAVEN	CANAL LINE RR	10,000	1929	4	4	5
14	ROUTE 8 NB	WATERBURY	I-84,RTE 8, RIVERSIDE ST	28,350	1966	4	6	6
15	US ROUTE 202	LITCHFIELD	BANTAM RIVER	8,700	1931	6	4	6
16	US ROUTE 6	PLYMOUTH	PEQUABUCK RIVER	16,900	1957	4	7	7
17	ROUTE 3	WETHERSFIELD	GREAT MEADOW RD/CT RV	50,800	1959	4	4	6
18	W. WASHINGTON ST	BRISTOL	COPPER MINE BROOK	6,000	1938	3	3	5
19	SIGOURNEY STREET	HARTFORD	CENTRAL NE RR	11,000	1912	7	4	7
20	SR 503 EASTBOUND	HARTFORD	RTE 84&AMTRAK	10,950	1969	5	4	4
21	INTERSTATE-84 EB	NEWTOWN	CENTER STREET	35,600	1978	6	4	7
22	ROUTE 229	SOUTHINGTON	INTERSTATE-84	19,000	1963	5	6	4
23	ROUTE 15	GREENWICH	RIVERSVILLE RD	49,700	1988	7	6	4
24	INTERSTATE-91 NB	NEW HAVEN	US 5 & FERRY ST	62,400	1964	6	4	7
25	ROUTE 80	N. BRANFORD	FARM RIVER	18,300	1930	7	4	6
26	ROUTE 74	TOLLAND	INTERSTATE 84	6,700	1952	3	6	7
27	SIGOURNEY STREET	HARTFORD	CAPITAL AVE, AMTRAK	9,001	1964	4	6	4
28	ROUTE 160	ROCKY HILL	INTERSTATE-91 SB	8,500	1965	7	4	5
29	US ROUTE 44	POMFRET	WAPPOQUIA BROOK	5,200	1933	5	4	5
30	ROUTE 66	WINDHAM	NE CENTRAL RR	9,200	1937	6	4	6
31	CD WB ROADWAY	MANCHESTER	I84 RAMP J(RT44 - I84WB)	7,200	1984	6	4	7
32	SACKETT POINT RD	NORTH HAVEN	QUINNIPIAC RIVER	11,000	1936	3	5	5
33	INTERSTATE-84 WB	SOUTHINGTON	MARION AVENUE	39,650	1963	7	4	6
34	ROUTE 17	GLASTONBURY	HUBBARD STREET	13,300	1953	3	7	7
35	INTERSTATE-84 EB	SOUTHINGTON	MARION AVENUE	39,050	1963	7	4	6
36	US ROUTE 6	WATERTOWN	STEELE BROOK	9,100	1957	8	4	6
37	SR 527	VERNON	HOCKANUM RIVER	11,100	1990	6	4	7
38	I-84 TR 823	HARTFORD	I84,503,RR,CAP AV,	7,900	1969	4	4	4
39	US ROUTE 44	SALISBURY	WACHOCASTINOOK CR>	7,500	1951	4	6	7
40	INTERSTATE-84 WB	SOUTHINGTON	ABANDONED B&M RR	38,950	1963	5	4	6

Source: Connecticut Department of Transportation

Major components of the bridge, such as the deck, substructure and superstructure are also rated on a sale from 0-9. If any component is rated from 0-4, the bridge is rated as structurally deficient. The following chart describes the rating scale applied to bridge components.

Chart 4. Bridge component rating scale description

0	Failed condition
1	Imminent failure condition
2	Critical condition
3	Serious condition
4	Poor condition
5	Fair condition
6	Satisfactory condition
7	Good condition
8	Very good condition
9	Excellent condition

Source: Federal Highway Administration

Importance of Transportation to Economic Growth

The new culture of business demands that an area have well-maintained and efficient roads, highways and bridges if it is to remain economically competitive. The advent of modern national and global communications and the impact of free trade in North America and elsewhere have resulted in a significant increase in freight movement. Consequently, the quality of a region's transportation system has become a key component in a business's ability to compete locally, nationally and internationally.

Businesses have responded to improved communications and the greater 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. 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. 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, $75 billion in goods are shipped from sites in Connecticut and another $82 billion in goods are shipped to sites in Connecticut, mostly by trucks.[17] Seventy-four percent of the goods shipped annually from sites in Connecticut are carried by trucks and another 18 percent are carried by courier services, which use trucks for part of their deliveries. Similarly, 75 percent of the goods shipped to sites in Connecticut are carried by trucks and another 21 percent are carried by courier services, which use trucks for part of their deliveries.[18]

Trucking is a crucial part of Connecticut's economy, as commercial trucks move goods from sites across the state to markets inside and outside the state. Commercial truck travel in Connecticut is expected to increase significantly over the next two decades, placing additional stress on the state's already overburdened transportation system. Based on federal projections, TRIP estimates that commercial trucking will increase by 48 percent in Connecticut by the year 2020.[19]

Highway Funding in Connecticut

Connecticut lacks adequate funding to complete road and bridge repairs and improvements that would to allow the state to make needed bridge repairs, maintain and improve road conditions over the next decade. This shortfall is exacerbated by increasing highway construction costs.

The Connecticut Department of Transportation (CDOT) estimates that from 2008 to 2017, a total of $10.6 billion is needed to repair, maintain and expand the state's roads, highways and bridges to improve conditions and accommodate growing traffic levels. However, CDOT estimates that only $7.5 billion will be available during this time, leaving a shortfall of approximately $3.1 billion for needed improvements, preservation and maintenance on the state's transportation system.[20]

Further exacerbating the state's existing funding shortfall is the fact that the cost of roadway improvements is escalating because the price of key materials needed for highway and bridge construction has increased rapidly. Over the last three years, the average cost of materials used for highway construction, including asphalt, concrete, steel and diesel has increased by 43 percent.[21]

Because of the significant shortfall in highway transportation funding in the state, numerous needed transportation projects will not be able to move forward. TRIP has asked CDOT to identify significant bridge construction, rehabilitation or reconstruction projects ($5 million or more) that are needed, but currently lack adequate funding to proceed.

Chart 5. Needed but unfunded bridge projects.

Route Carried	City/Project Description	Route or feature inte	Average Daily Traffic	Estimated Cost
I-84/CT 8	Waterbury (Interchange)		74,300	1,000,000,000
CT 66	Middletown (New Bridge)	CT River, Rt 9	33,600	1,000,000,000
I-84 & Local Streets	Hartford (Aetna Viaduct)	Park River	133,600	750,000,000
I-95	Stratford (Moses Wheeler)	Housatonic River	111,000	360,000,000
I-95	New Haven	West River	134,200	160,000,000
CT 2A	Preston	Thames River	27,100	120,000,000
I-95	Stamford	Metro North RR	129,300	100,000,000
CT 3	Glastonbury (Putnam Bridge)	CT River	51,000	90,000,000

Source: Connecticut Department of Transportation

TRIP also asked the Department to identify significant highway maintenance and improvement projects throughout the state that are needed, but currently unfunded.

Chart 6. Needed roadway maintenance and improvement projects that currently lack adequate funding to proceed.

Route Name	City/Project Description	From	To	Length in Miles	Average Daily Traffic	Estimated Cost
I-95	Branford to RI (Reconstruction-Widening)				97,200	1,600,000,000
I-84	Waterbury to Danbury (Widening)	0	10.38	10.38	68,900	850,000,000
I-84	Waterbury (Upgrade Expressway)	33.68	36.42	2.74	92,600	288,000,000
I-95	New Haven (Long Wharf)	46.27	47.37	1.1	150,100	250,000,000
I-84 / CT 4	Farmington (Revise Interchange)					120,000,000
I-95	Norwalk (Revise Interchange)	14.65	15.65	1	135,100	75,000,000
I-91	Middletown (Resurfacing)	17.15	25.75	8.6	82,500	40,000,000
I-95	Norwalk (Median & Resurfacing)	16.2	18.21	2.01	130,100	38,700,000
I-84	West Hartford (Safety Improvements)					25,000,000
I-84	Danbury (Intersection Modifications)	0.65	16.14	15.49	71,700	25,000,000
I-91	New Haven (Reconstruct Exit 8 Offramp)	2.59	2.93	0.34	132,500	14,300,000
US 6	Danbury (Widening)	2.44	3.76	1.32	18,200	17,100,000
CT 85	Salem (Spot Safety Improvements)	6.4	11.4	5	11,900	20,200,000
US 1	Orange (Operational Lane)	41.6	43.2	1.6	19,600	13,150,000

Source: Connecticut Department of Transportation

Conclusion

Connecticut's extensive system of roads and bridges provides its residents and visitors with a high level of mobility. However, without additional funding to preserve, maintain and

improve the transportation system, the state's roads and bridges will become increasingly deteriorated and overburdened.

A well-maintained highway system in Connecticut is critical to the state's ability to accommodate future growth safely and efficiently as the state's population and vehicle travel increase. Increased highway funding would allow for the improvement of road and bridge conditions, boosting the quality of life in the state for residents, businesses and visitors.

Endnotes

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[9] TRIP analysis of Connecticut DOT response to TRIP survey, 2007.
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[15] ConnDOT response to TRIP survey
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[17] Bureau of Transportation Statistics, U.S. Department of Transportation. 2002 Commodity Flow Survey, State Summaries.
[18] Ibid.
[19] U.S. Department of Transportation: Office of Freight Management and Operations. www.fhwa.dot.gov.

[20] ConnDOT response to TRIP survey.

[21] Bureau of Labor Statistics, index of highway and street construction materials cost, December 2003 to November 2006.