



CONNECTICUT DEPARTMENT OF TRANSPORTATION

2800 BERLIN TURNPIKE P.O. BOX 317546 NEWINGTON CONNECTICUT 06131-7546

March 13, 2015

As part of Governor Dannel P. Malloy's 30-year transportation vision, *Let's Go CT!*, and the accompanying five-year ramp-up plan, the Connecticut Department of Transportation (CTDOT) has prepared a series of updates and fact sheets on various aspects of the program. These documents were prepared to facilitate a discussion about existing conditions and what it will take to transform Connecticut infrastructure into a first-class, integrated, multi-modal system that citizens will value.

The series includes updates on pavements, roadway bridges, traffic bottlenecks, the moveable bridges on the New Haven commuter rail line and bus transit in Connecticut.

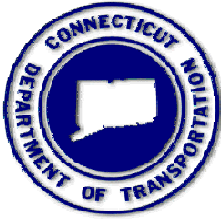
Below are links to each of the fact sheets:

- Pavement
- Roadway Bridges
- Traffic Bottlenecks
- Moveable Rail Bridges
- Bus System

For questions or interview requests, please contact me.

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Connecticut's Pavement Conditions and Needs Let's Go CT! March 2015

Overview

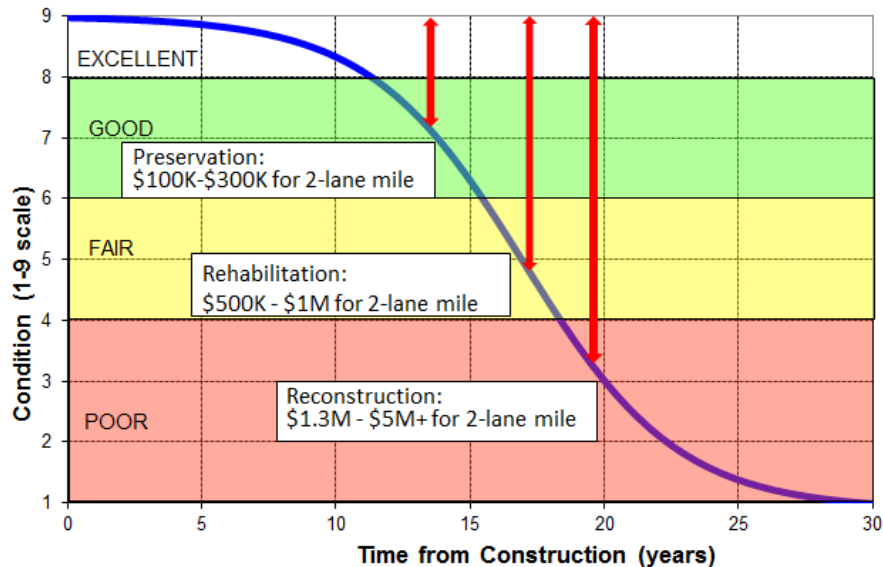
Connecticut's highway system provides the backbone to the state's multi-modal transportation network. The Connecticut Department of Transportation (CTDOT) is responsible for all aspects of the planning, development, maintenance, and improvement of the state roadway transportation system, of which pavement is a critical element. In Connecticut there are 3,734 route miles (9,834 lane miles) of State maintained public roadways.

Currently CTDOT invests between \$105 million to \$135 million annually to address pavement needs on the State maintained network. Yet, these funding levels are not sufficient to prevent significant growth in the backlog of poor pavements. That means, with current funding conditions being constant, the share of State maintained roads in poor condition will rise from 4% today to 23% thirty years from now. And where today 47% of pavements are in less-than good condition, this number would continue to grow to 71% over the same period.

Current State

Pavement Inventory	3,734 route miles (9,834 lane miles) of State maintained roadways in Connecticut.
Age	<p>State Maintained Roadways</p> <ul style="list-style-type: none"> • 35% built prior to 1950 • 44% built between 1950 and 1980 • 21% built since 1980 <p><i>Average State road surface pavement is 9½ years old and lasts about 12 to 15 years.</i></p>
Existing Condition	<p>State Maintained Roadways</p> <ul style="list-style-type: none"> • 53% Good or Excellent • 43% Fair • 4% Poor <p><i>A majority of existing State maintained road pavements were built with a 20-year structural design life. Through rehabilitation and resurfacing programs, the Connecticut Department of Transportation (CTDOT) has managed to extend the original expectations of the State's highway network life.</i></p>

Connecticut must address the extensive backlog of pavements that are already in need of major repair or replacement. Once a pavement is in backlog, it costs significantly more to fix the pavement than it does to maintain pavement in good condition, as the chart below demonstrates. In addition, total project costs can easily be twice the pavement costs for a typical rehabilitation and five times the pavement costs for a reconstruction project.



Actions Taken So Far

Today, CTDOT has already begun to address these needs through a pavement preservation program that maintains good pavements in good condition. The program has been ramped up to an average of \$48 million a year since 2011 and is being increased to \$68 million a year for 2015 and 2016. CTDOT also has a resurfacing program of about \$57 million a year. This combined investment strategy is yielding an 11% annual rate of return. At today's funding level, every additional \$1 Million in funding for pavement preservation avoids adding an additional \$2 million a year to the backlog.

Steps Forward

The investments and vision outlined by Let's Go CT! provides for doubling current pavement funding to approximately \$250 million and allows the implementation of a sustainable strategy that eliminates the backlog of pavement repair or replacement work over the long term. This strategy also preserves the pavement investments that have already been made, improves the overall condition of the roadway network and ultimately allows the CTDOT to maintain these good conditions moving forward, resulting in 0% poor pavements and an overall good network condition.

The roadmap to achieving the results with Let's Go CT! consists of a comprehensive, prioritized strategy that optimizes investments:

1. Systematic preservation of good pavements, which is the highest return on investment;
2. Gradual elimination of the backlog through rehabilitation, reconstruction, and expansion projects;
3. Subsequent preservation of these pavements;
4. Provisions to ensure safe and rideable surfaces for pavements awaiting rehabilitation; and the
5. Adoption of emerging pavement technologies that increase efficiencies and reduce costs.

CTDOT has implemented condition-assessment and forecasting tools as well as performance metrics to provide strategic direction and monitor progress.



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Connecticut's Bridge Conditions and Needs

Let's Go CT!

March 2015

Overview

Keeping the State's bridges in good condition is one of the key tasks of the Connecticut Department of Transportation (CTDOT). This task can be challenging due to several issues including the high average age of existing bridges and structures in Connecticut, difficult weather conditions, heavy traffic, and available resources. Of the 4,006 bridges and structures maintained by the CTDOT, 334 bridges and 1 tunnel are rated in "poor" condition, accounting for 8% of the inventory. In fact, the number of poor rated bridges has been rising steadily since 1998, when a 14 year sustained bridge investment program, initiated in the wake of the Mianus River bridge disaster, came to an end.

The CTDOT prolongs the life of its bridges and ensures the bridges remain safe through routine maintenance work performed by bridge maintenance staff, along with preservation and rehabilitation projects performed by general contractors. Delaying maintenance only increases the rate of deterioration of the bridges.

Current State

Bridge Inventory	5,296 bridges inspected by Connecticut DOT <ul style="list-style-type: none"> • 4,006 maintained by Connecticut DOT • 1,290 maintained by towns or others. Each of these bridges is greater than 20 feet in length. 	
Age	State Maintained Bridges <ul style="list-style-type: none"> • 28% built prior to 1950 • 51% built between 1950 and 1980 • 21% built since 1980 	Bridges Maintained by Others (Over 20 ft) <ul style="list-style-type: none"> • 27% built prior to 1950 • 37% built between 1950 and 1980 • 36% built since 1980
Existing Condition	State Maintained Bridges <ul style="list-style-type: none"> • 30% Good or Excellent • 62% Fair • 8% Poor by number 	Bridges Maintained by Others (Over 20 ft) <ul style="list-style-type: none"> • 39% Good or Excellent • 48% Fair • 13% Poor
<p><i>A majority of the existing bridges were built with a 50-year structural design life. Bridges built today have a 75-year structural design life.</i></p>		

Action Taken So Far

Today, the CTDOT programs roughly \$400 Million per year to maintain the existing bridges. However, at this current funding level the percent of State-inventoried bridges in poor condition by deck area will rise from 17 % today to over 20% twenty years from now.

State maintained bridges needing repair or replacement are identified by State bridge inspectors, and projects are prioritized based on the severity of their condition. In the future, state maintained bridges will also be identified by predicting deterioration and programming repairs for projects well before they are found to be rated poor. Maintaining bridges in a state of good repair extends their useful life, reducing the need for costly restorations or replacements. This new asset management approach will bring CTDOT maintained bridges towards a state of good repair by managing the bridge assets in a manner which will be the least expensive over the design life of the bridge.

Steps to Modernize / Make Best In-Class From Here

Many of the State's larger bridges or bridges along congested routes are scheduled to be repaired or replaced as part of capacity improvement projects, such as widening parts of the Interstate highways. These projects have been identified in the *Let's Go CT!* long-term program. Over the next 30 years, the CTDOT estimates needing about \$18.7 Billion to bring and keep the balance of the State's bridges in a state of good repair. Up to \$6 Billion more will be needed for bridge work if the capacity improvements projects are not completed. This would require roughly doubling the existing bridge program to \$800 Million per year. Such an investment would vastly improve the number of bridges rated poor, resulting in less than 1% of the number of State inventoried bridges being rated in poor condition.



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Connecticut's Traffic Bottlenecks *Let's Go CT!* March 2015

Overview

The 652 miles of Interstate and limited access highways in Connecticut comprise only 3 percent of all road miles, but they carry nearly 50 percent of all traffic. These roads are the main corridors of travel in most areas of Connecticut, serving the daily trips of commuters and families, the delivery of goods to stores, and the shipment of materials, supplies, and products to and from businesses. Our limited-access highways link us to major cities and economic centers in the northeast like Boston and New York, but also to economic centers as far away as the west coast.

Today, many of our highways are overburdened by the growing demand. The resultant congestion is reducing our quality of life, causing delays to deliveries, and driving up the cost of shipping and doing business. It is estimated that over the course of a year, the average person spends the equivalent of a full work week (40 hours) stuck in traffic; and this costs residents and businesses over \$1.6 billion in lost time and wasted fuel. In addition, deficient roads and bridges cost residents and businesses another \$2.6 billion each year in higher vehicle operating costs and accidents. In an age when businesses increasingly rely on 'just-in-time' delivery to operate safely and efficiently in competitive global markets, congestion and roadway conditions can significantly reduce our ability to compete.

Best-in-Class Strategy for Congestion

Let's Go CT! proposes a multimodal, multi-level approach to reducing congestion. It includes improving transit options in key corridors such as I-95 where Metro-North rail service will be upgraded to provide more frequent and reliable service, with more express service as well. But it also calls for widening long sections of I-95 in the same corridor, and similar widening projects on other major highways like I-84. However, congestion is often caused by more localized bottlenecks such as critical highway interchanges where exit and exit ramps do not have sufficient capacity to handle growing traffic volumes. A key part of the *Let's Go CT!* strategy is to fix these major bottlenecks.

Traffic chokepoints might be caused by a single highway ramp, but their impacts extend well beyond the ramp itself and traffic backups can extend for a mile or more. These backups often cause accidents when drivers are forced to quickly reduce speed when they unexpectedly encounter stalled traffic.

Fixing these traffic snarls can yield congestion and safety benefits far beyond the cost required to correct them. Since eliminating a bottleneck typically yields a large benefit for every dollar

invested, the *Let's Go CT* proposal includes funding to fix major bottlenecks throughout the state. Examples include:

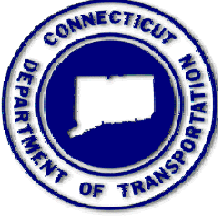
- *I-91/Charter Oak Bridge (Route 15) interchange in Hartford.* Single-lane on-ramp. The on-ramp from I-91 northbound to northbound Route 15 is a single lane without enough capacity to handle the volume of traffic and heavy trucks.
- *Merritt Parkway/Route 7 interchange in Norwalk.* Missing connections. Some of the ramps needed to connect from one highway to the other are missing. Traffic is forced onto local streets to make the connections.
- *I-95/I-395 interchange in East Lyme/Waterford (interchange 76).* The left-hand exit from I-95 westbound to I-395 northbound creates safety and congestion problems. The close proximity to interchange 75 (I-95/Route 1) also creates operational problems.
- *I-91/I-691/Route 15 interchanges in Meriden.* This is a complex network of interchanges that extends over a mile in order to accommodate all the connecting ramps. The large traffic volumes and out dated design leads to numerous congestion and safety problems.

The **I-91/Charter Oak Bridge interchange** is discussed in more detail below to illustrate some of the problems with these interchanges, and to show the potential economic returns that can be realized when we fix the problems.

Every day over 120,000 vehicles use I-91 to travel to or from Hartford to points south. Nearly 22,000 of those are northbound cars and trucks that use exit 29 to reach I-84 via Route 15 and the Charter Oak Bridge over the Connecticut River. Traffic routinely backs up on the single-lane ramp because a single lane is not sufficient to handle the volume. Also, the grade of the existing exit 29 adds to the problem since it serves a high volume of tractor-trailer trucks, which have difficulty climbing the steep ramp. While this is now a daily problem, it is most severe on Fridays, Saturdays, and Sundays when people are traveling to or from weekend destinations.

During these peak demand times, traffic frequently backs up onto the main travel lanes of I-91 and affects all I-91 traffic – not just those using exit 29. These backs-ups can extend 1.4 miles causing major delays and creating a safety problem that is reflected in the high accident rate for this segment of I-91. To fix the problem, the existing exit 29 ramp will be removed and a new 2-lane connection to the Charter Oak Bridge will be built just south of the bridge carrying I-91 over Route 15. The new ramp alignment will reduce the steep grade on the approach to the Charter Oak Bridge.

A benefit/cost analysis conducted for this project estimated a net benefit to users of **\$3.78 for every \$1.00 spent**. The economic benefits can be measured in terms of time savings to drivers, lower vehicle operating costs, and fewer accidents. Benefits also include the reduced costs of shipping and increased shipper productivity. The project is also expected to have a long lasting impact on the overall level of economic activity in the form of increased economic output, value added, jobs, and wages/labor income. During construction, the Charter Oak Bridge project will generate 1,100 construction jobs, and economic modelling suggests that over the next 25 years the investment will return over **\$860 million in economic output**, providing an impetus for the creation of over 200 permanent jobs in the greater Hartford region.



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Rail Bridge Conditions and Needs on New Haven Line ***Let's Go CT!*** **March 2015**

Overview

The New Haven Line (NHL) is the busiest commuter rail corridor in the country with over 40 million trips per year. Critical to Connecticut's rail system are 203 railroad bridges, many of which are more than 100 years old. With the high number of trains that use the system daily, time for bridge maintenance and repair is limited. In addition to carrying passenger rail cars, these bridges also carry much heavier freight car loads as well. In fact, since the date of construction for most of these bridges, the maximum weight of a freight car has increased by over 100,000 pounds. As a result, the current percentage of bridges that are rated less than good condition is at 78%.

From 2005 to 2015 annual capital investments for the preservation and timber programs had a combined average of about \$4 million per year. During these same years other capital investments for rehabilitation and replacement of the NHL rail bridges ranged from no dollars in some years to \$30 Million in others. Over the years, these marginal and spotty capital investments have been able to keep the NHL rail bridges in service, but have not been enough to significantly reduce the number of poor condition bridges, which remains at 22%.

The most critical of the NHL poor-rated bridges are four moveable bridges. Each one of them is over 100 years old. These bridges include the Cos Cob bridge over the Mianus River in Greenwich, the Walk bridge over the Norwalk River in Norwalk, the Saga bridge over the Saugatuck River in Westport and the Devon Bridge over the Housatonic River between Milford and Stratford. Each of these bridges open and close to allow marine traffic that cannot normally clear the bridge to pass. The condition of these bridges can cause major disruptions in train traffic when they do not close properly. Interstate 95 is one of the most congested routes in the country. With a long-term failure of one of the moveable bridges, the highway would have to handle the added burden of 125,000 commuters on a daily basis. However, even when they are in the closed position, the condition of the bridges reduces the performance of the rail line because of the speed restrictions and weight limitations that are imposed on them.

Current State

Bridge Inventory	<p>203 Total NHL Bridges</p> <ul style="list-style-type: none"> • 198 fixed rail bridges • 5 moveable rail bridges <p><i>All of these bridges are inspected and maintained by CTDOT.</i></p>
Age	<ul style="list-style-type: none"> • 76% built prior to 1940 • 9% built between 1940 and 1990 • 15% built since 1990 <p><i>Many of the existing bridges are over 100 years old.</i></p>
Existing Condition	<ul style="list-style-type: none"> • 22% Good or Excellent • 56% Fair • 22% Poor <p><i>There is no design life specified in the original plans for many of the older existing bridges, however rail bridges built today have a 75-year structural design life.</i></p>

Action Taken So Far

In two separate but similar incidents in 2014, the Walk Bridge failed to properly close and allow the moveable span's track rails to seat. This prevented trains from being allowed to cross the bridge for an extended period of time. As a result, CTDOT performed emergency repairs to the 118-year-old structure including modifications to the assemblies that lift the rail tracks clear to allow the bridge to swing open. Additional repairs were also performed including the installation of electronic switches that prevent the various gears from over-rotating, which was the cause of the recent failures. These emergency repairs were performed quickly in order to restore service. Although this bridge is now operational it is also currently in design to be replaced.

CTDOT is also advancing the designs for the rehab and or replacement of the Cos Cob, Saga and Devon bridges. Steel repair and bridge timber replacements are expected to begin this year on all three of these bridges.

Steps Forward

The investments outlined by *Lets Go CT!* call for \$2.825 billion to address the long-term rehab and or replacement costs of all four moveable rail bridges on the NHL. These investments will result in all of the moveable rail bridges to be rated in good condition, thus preventing future failures. Beyond the moveable bridge projects, *Let's Go CT!* also calls for an additional \$2.2 billion to complete repairs and replacements of the remaining fixed bridges on the NHL. These investments upgrade all of the fixed rail bridges to a state of good repair.



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Connecticut's Bus System *Let's Go CT!* March 2015

Overview

Bus service is the foundation of Connecticut's transit system, and serves many functions and geographic areas. In urban markets, it is the primary means of commuting to work for transit-dependent workers, but also the mode of choice for many suburban residents who use express buses. In cities with rail service like Stamford, Bridgeport and New Haven, buses and private shuttles expand the reach of rail service by transporting rail passengers to workplaces located beyond walking distance from the train station. Public bus services are also important to the elderly, those with disabilities, and rural residents. In total, more than 42 million passenger trips are made annually on the statewide bus system.

The State of Connecticut subsidizes the majority of the cost to operate fixed local bus service in twenty urban and rural service areas, ADA/Paratransit and Dial-a-Ride services, as well as express bus service in the Hartford area. These bus systems provide vital transportation links for the young, elderly, mobility impaired and transit dependent, as well as travel options for those riders who wish to use public transportation rather than their car.

CTTransit is Connecticut's largest bus operator, providing approximately 31 million of all public bus passenger trips. Thirteen transit districts provide public bus operations for the remaining urban and rural areas of the state. In accordance with the Americans with Disabilities Act (ADA) of 1990, paratransit (on demand) services are provided by 12 transit operators in all areas with local fixed route bus service. The ADA paratransit program provides mobility to people with qualifying disabilities who travel within the service area of the regular fixed-route bus system.

Existing System

Inventory	<ul style="list-style-type: none"> Approximately 700 buses on urban, express and shuttle routes More than 400 paratransit vehicles 10 bus maintenance facilities 			
Age of Bus Fleet	<ul style="list-style-type: none"> Average age of State-owned buses is 7 years Average age of Transit District owned buses is 9 years <p><i>A standard size bus (35-40 ft.) has a service life of 12 years. A medium size bus (30-ft) has a service life of 10-12 years.</i></p>			
Bus Fleet Condition	<ul style="list-style-type: none"> Average miles between road calls are 13,154 miles. 			
Bus Operations 2014	Trips 42 Million	Expenses \$189 Million	Revenue \$51 Million	State Subsidy \$133 Million

ADA Operations 2014	Trips 1 Million	Expenses \$35 Million	Revenue \$2 Million	State Subsidy \$32 Million
Dial-A-Ride Operations 2014	Trips 21,506	Expenses \$995,124	Revenue \$132,960	State Subsidy \$576,361

Performance

The use of bus transit results in decreased roadway traffic congestion, a reduction in vehicle accidents, improved air quality, improved access for transit dependent populations to work, education and other vital services, as well as land use and economic benefits: all of which provide an improved quality of life for Connecticut residents. Increased congestion levels, a need for reverse commuting to suburban locations, and federal mandates to reduce air pollution present a growing opportunity for bus transit, which in many cases is the most cost-effective and flexible transit mode.

Connecticut needs to re-evaluate the performance of the current bus network and its ability to connect people with jobs, education, health care and essential services. The existing network has been operating with only minor adjustments for many years, often not responding to changing population and employment shifts throughout the state. There has been a disproportionate growth in jobs and development outside of the central business districts. This growth won't be sustainable if it is too difficult for residents to get to jobs. This shift in job centers has left parts of our urbanized areas without access to convenient transit service, and the limited service that does exist is often slow and infrequent. Further, opportunities for integrating the many individual systems across the state, maximizing system coordination, and delivering effective customer service and information have not been addressed. Extending the coverage areas, providing connecting services between cities, and providing a more consistent level of service across the state are key goals of *Let's Go CT!*

Best-in-Class Strategy for Bus Service in Connecticut

Let's Go CT! calls for a complete re-evaluation of bus services in Connecticut with the ultimate goal of *increasing bus service availability in urbanized areas by 25 percent*. The service expansion will also address current opportunities for improving critical population and job connections, ensuring statewide service coordination and customer information, and implementing technology innovations like new fare collection systems and real-time bus location information. *Let's Go CT!* also capitalizes on the value of Bus Rapid Transit (BRT) throughout the state, first by extending *CTfastrak* east of Hartford, then implementing BRT services in major urban areas including Fairfield county, New Haven and New London. To accomplish this, the 5 Year Ramp-Up Transportation plan calls for the expenditure of \$43 million to purchase new buses, improve maintenance facilities, implement the expansion of *CTfastrak* to Manchester, BRT service along Route 1 between Norwalk and Stamford, and deliver real-time bus location information state-wide. *Let's Go CT!* over the 30 year horizon programs \$2.8 billion to deliver a state-of-the art transit network, new and renewed vehicles and maintenance facilities, and the best-in-class delivery of cost-effective, affordable, high quality customer service.