A Bridge to Everywhere

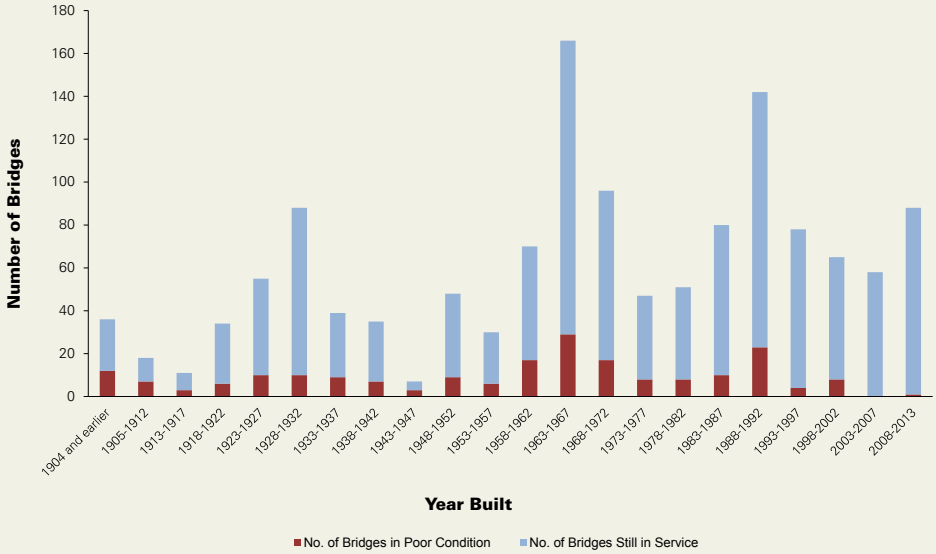
Bridges are vital to our daily lives and to the health of our state's economy; yet we are not investing enough to properly maintain them. ***Rhode Island can't afford not to act.***

Exposed and rusted rebar and crumbling concrete on the Warren Avenue Bridge in East Providence.

One in nine of the nation's bridges are rated as structurally deficient.

One in six are structurally deficient in Rhode Island.

Age and Condition of Rhode Island's In-service Bridges



Headlines depicting deteriorating bridges have been sweeping the nation for several years. The American Association of State Highway and Transportation Officials (AASHTO) identified a funding gap of at least $134 billion annually to meet transportation capital needs at a national level.

There are 1,154 bridge structures located throughout the State of Rhode Island. As of January 2014, **206** of these bridges have been identified as structurally deficient. Of those, **94** are weight restricted and **9** remain closed due to advanced deterioration. Closures and weight limits cause lengthy detours and traffic congestion, impacting both Rhode Islanders' quality of life and the movement of goods and services throughout the state.

Making the Investment

IN RHODE ISLAND'S BRIDGES

"Having reliable and long-term infrastructure maintenance plans will help the State to create the conditions for businesses to thrive and improve the quality of life for our citizens by promoting the State's long-term economic health and prosperity."

- Marcel Valois, Executive Director
  Rhode Island Commerce Corporation

There are a number of factors contributing to the condition of bridges in Rhode Island, such as age of the structures (over 50 percent of our bridges are 40 years old or older), climate, high population density, and changes in traffic volumes and routes. The most critical element of bridge condition, however, is the level of investment made in ongoing maintenance. In Rhode Island, decreasing gas tax revenue, limited funding sources, and increasing debt service costs have led to a decline in the investment in Rhode Island's roads and bridges. Simply put, Rhode Island hasn't been able to keep up with the needs of the aging infrastructure.

Currently, there is no state-funded capital program. The money received from the state's gas tax supports a limited maintenance program in addition to the state match for federal funds. Everything else is solely reliant on the money received from the federal government. It's just not enough. Rhode Island needs to find new, sustainable ways to fund vital improvements.

There are 1,154 bridges located throughout the State of Rhode Island. This includes any structure five feet or longer, as defined by Rhode Island law. Making an investment in Rhode Island's bridges will significantly improve safety and mobility, enhance communities, and help boost local business and future economic development. Rhode Island's bridges are vital links connecting the state with global and regional economies, and connecting people to home, work, and play.

In addition to improving economy and quality of life, the ten-year **Better Bridge Program** will improve the state's bridges with the goal of meeting federal performance requirements, including the new, performance-oriented, Moving Ahead for Progress in the 21st Century (MAP-21) federal transportation authorization statute and regulations.

MAP-21 establishes a minimum standard for National Highway System (NHS) bridge conditions. This standard requires the state to invest a specific percentage of its funding in NHS bridges if more than 10 percent of the total deck area of these bridges is on structurally deficient bridges. Funds must be expended each year until the condition meets the maximum 10 percent.

* The National Highway System is a federally defined network of major roadways that are important to our nation's economy, defense and mobility.

Bridge Ratings and Condition of Rhode Island Bridges

RATING
1–4

POOR

Remediation

COST:
$400 per square foot

ACTIVITIES:
major rehabilitation or replacement

RATING
5–6

FAIR

Preservation

COST:
$120 per square foot

ACTIVITIES:
repainting, minor repairs

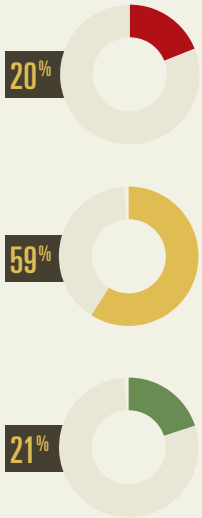
RATING
7+

GOOD

Low Maintenance

COST:
$3 per square foot

ACTIVITIES:
sweeping, washing



How Bad Is It?

BRIDGE RATINGS FOR RHODE ISLAND

What is structural deficiency?
Structural deficiency is determined through a complex rating system (0-9, with 0 being the worst and 9 being excellent) for each of three bridge elements: deck, superstructure, and substructure. A highway bridge is classified as structurally deficient if any of the three elements are in poor condition (0 to 4 on the rating scale). A bridge can also be classified as structurally deficient if its load-carrying capacity is significantly below current design standards, or if a waterway below frequently overtops the bridge during flooding.

The 10 percent maximum set forth by the federal government focuses on Rhode Island's NHS bridges, 390 of the 1,154 bridges in the state. Seventy-seven are considered structurally deficient, approximately 20 percent of the deck area of all NHS bridges.

One hundred thirty bridge structures are rated fair (5-6) and are considered at risk of becoming structurally deficient. Rhode Island has an aging bridge inventory: Using deterioration models and reviewing inspection data, it is estimated that 15 percent of bridges rated as fair will fall into the structurally deficient category each year.

The Escoheag Hill Road Bridge was closed for eight days for repairs in 2013, resulting in a detour more than 20 miles long.

* Federal law defines a bridge as having a length of 20 feet or more. Rhode Island law defines a bridge as having a length of 5 feet or more.

I-95 PAWTUCKET RIVER BRIDGE REPLACEMENT

STRUCTURALLY DEFICIENT BRIDGE IMPOSES ON THE CITY

What happens when we don't invest in our infrastructure? The Pawtucket River Bridge carries traffic over Taft Street and the Seekonk River. In 2007, a weight limit was imposed on the bridge, forcing heavy vehicles such as tractor trailers to be detoured onto city streets until the bridge could be replaced.

The ripple effect of these restrictions on the City of Pawtucket was felt by many. Quality of life was impacted as residents faced traffic, noise, and increased commutes—costing time and money. Drivers were reminded daily of the urgent need for a new bridge. Local and national businesses suffered because of traffic, ease of access, and costs associated with detours required because of the weight limit. In addition, the detour caused wear and tear on local Pawtucket roads. Time, resources, and more money were required to repair damaged local roadways.

In order to make one of our state's major thoroughfares safe for all vehicles again, RIDOT replaced the aging Pawtucket River Bridge. Innovative construction staging allowed RIDOT to maintain all travel lanes throughout construction, posing less of an impact on the motoring public and local residents. Through both Senate and House bills, the delegation secured a total of $4.16 million in federal appropriations to help repair the bridge.

The project, which was substantially completed in fall 2013, involved work on nine bridges in all. On the Interstate, three bridges were built where there were once two - one in each direction to carry northbound and southbound traffic, and an additional northbound structure to serve as an access road for the on- and off-ramps. The project also involved work on the School Street Exit (Exit 28), and bridges on Garden Street, George Street, Water Street, School Street and Pleasant Street.

The benefits of this project to the traveling public and the local community cannot be overstated. The unrestricted movement of people and commerce on the Interstate has been restored, commuting times reduced, and traffic flow improved. Local construction jobs were generated and this critical piece of the Interstate is now safe and strong for generations to come.

Now that the project is complete, the City of Pawtucket and the state will begin to realize the positive impacts the restored bridge has on the economy.

I-95 PROVIDENCE VIADUCT

MAKING THE INVESTMENT TO REPAIR THIS VITAL LINK

The Providence Viaduct is a 1,290-foot elevated structure that is more than 45 years old and in dire need of replacement. The structure has deteriorated to the point that it is no longer economically feasible to continue to maintain and/or rehabilitate it. The Viaduct is so heavily traveled that any further delay in replacing the structure would have resulted in lane restrictions, weight limits or even closure.

Any restrictions on the Viaduct in Providence would divert excessive and unsustainable amounts of traffic to Interstate 295 and other nearby roadways, roadways not built to accommodate the increased traffic volume. Along the entire Northeast region, the traffic and economic impacts would be dramatic, affecting local and regional trucking and commuting, reducing air quality and safety.

The replacement of the Viaduct is now underway with only the southbound project fully funded. The investment game must be changed in order to get ahead of costly projects like this and the Pawtucket River Bridge. The **Better Bridge Program** offers a way to preserve these valuable assets while keeping people and commerce moving throughout our state.

"We must be a state that maintains its infrastructure and continues to innovate for the benefit of all Rhode Islanders. We cannot afford to replace another bridge because of lack of maintenance."

-Governor Lincoln Chafee, Rhode Island

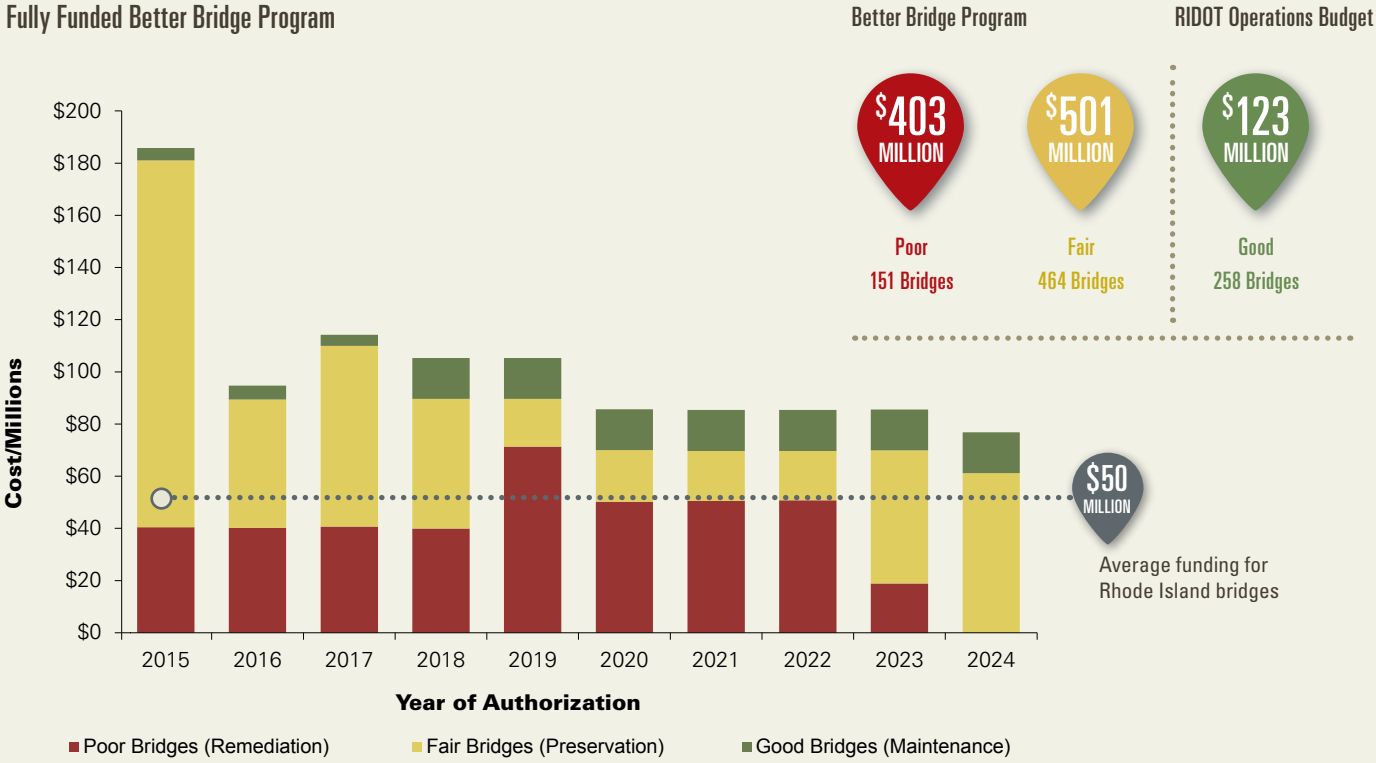
Federal, state and local officials sign a ceremonial beam at the groundbreaking event for the southbound Providence Viaduct project on July 15, 2013. Total construction value: $66.8 million.

In 2013, RIDOT announced a new bridge preservation program aimed at completing minor repairs and maintenance activities to extend the life of our bridge structures. Over the next three years, 30 overpasses along the Route 95 corridor will get a facelift. In lieu of rusting steel, drivers coming into the capital city will be met by newly painted "Ocean State Blue" facades.

Studies show that the life of a bridge can be extended by 12-20 years simply by painting the steel structural elements to prevent corrosion.

Can Rhode Island Afford Not to Make the Investment?

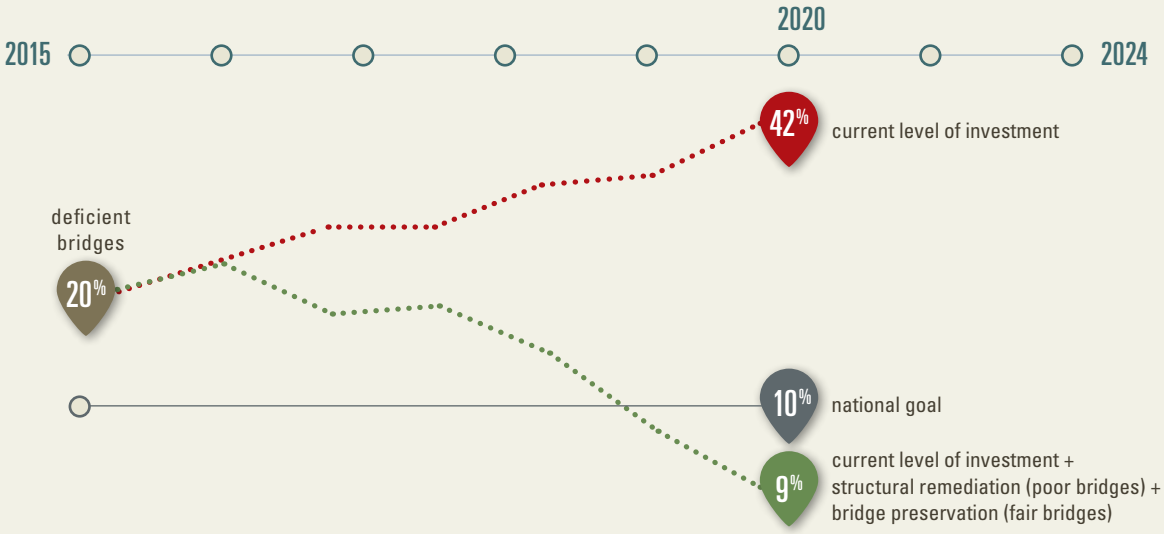
Fully Funded Better Bridge Program



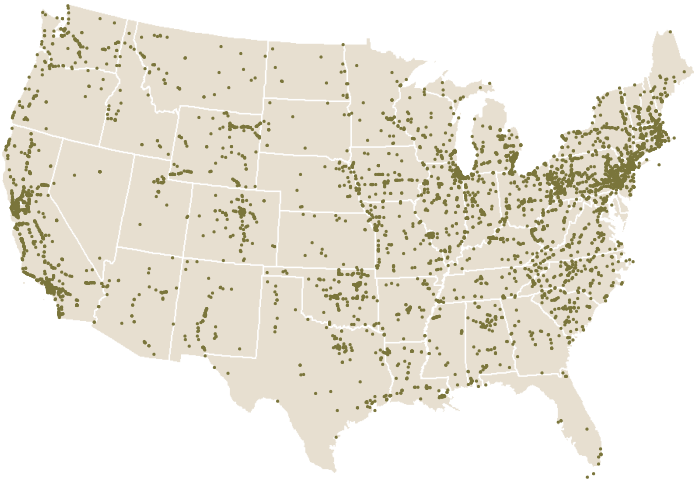
* this assumes all requirements will be complete for the Program to start in 2015

* excludes Route 6/10 Interchange Project - $400 million to $500 million

Deck Areas of Structurally Deficient Bridges



RIDOT is responsible for approximately 3,000 miles of road, which is the equivalent of a one-lane road from Providence to Seattle. We have 1,154 bridges in our inventory, or enough to place one every 2.6 miles on that trip to Seattle. Because 206 of these bridges are rated as structurally deficient, you can drive from Rhode Island to Cleveland before crossing a bridge in fair condition.



The dots on this map identify the locations of structurally deficient bridges on the National Highway System throughout the U.S. The concentration of deficient structures is dramatically higher in the northeast.

Keeping Rhode Island's Bridges Safe

The **Better Bridge Program** is a 10-year program to improve the state's bridges with the goal of meeting performance requirements by 2020.

More funding is needed. Rhode Island cannot afford NOT to make the investment.

The **Better Bridge Program** addresses the condition of all state-maintained bridges, not just the 390 bridges in the NHS. There are 214 non-NHS bridges over 20 feet in length that stand to lose funding if the federal government begins redirecting money to NHS bridges. The impact would be more weight limits and closures in local communities.

Between 2015 and 2024, there are 615 bridges eligible for the **Better Bridge Program**. Total cost: $904 million. If we do not properly maintain these structures, they will require major rehabilitation or replacement. Total cost: $1.66 billion.

With the right investment, the Better Bridge Program has the potential to save the state $763 million. We can jump from the bottom to a top 10 state in a short period of time.

Completed and Ongoing Bridge Improvement Projects—last 5 years

Barrington
Central Bridge
Bridge Preservation
I-95 (13 bridges)
1-195 (18 bridges)
Bristol
Poppasquash Culvert (Poppasquash)
Poppasquash
Burrillville
Shippee
Pascoag
Mohegan
Granite Mill
Round Top
Coventry
Laurel Avenue
Cranston
Pontiac Avenue
Pocasset River
Cumberland
295 over Blackstone
East Greenwich
Frenchtown Brook
Division Street
East Providence
Waterman Ave
Henderson Bridge
Ten Mile River (2 bridges)
Warren Avenue Ramp S.
Exeter
Austin Farm
Escoheag Hill
Lewis City
Ten Rod Road
Falls River
Frosty Hollow Road
Midway
Foster
Anthony Road
Hopkins Mill (Demolition)
Glocester
Chestnut Hill
Chepachet
Hopkinton
Barberville
Woodville
Holburton
Wyoming North

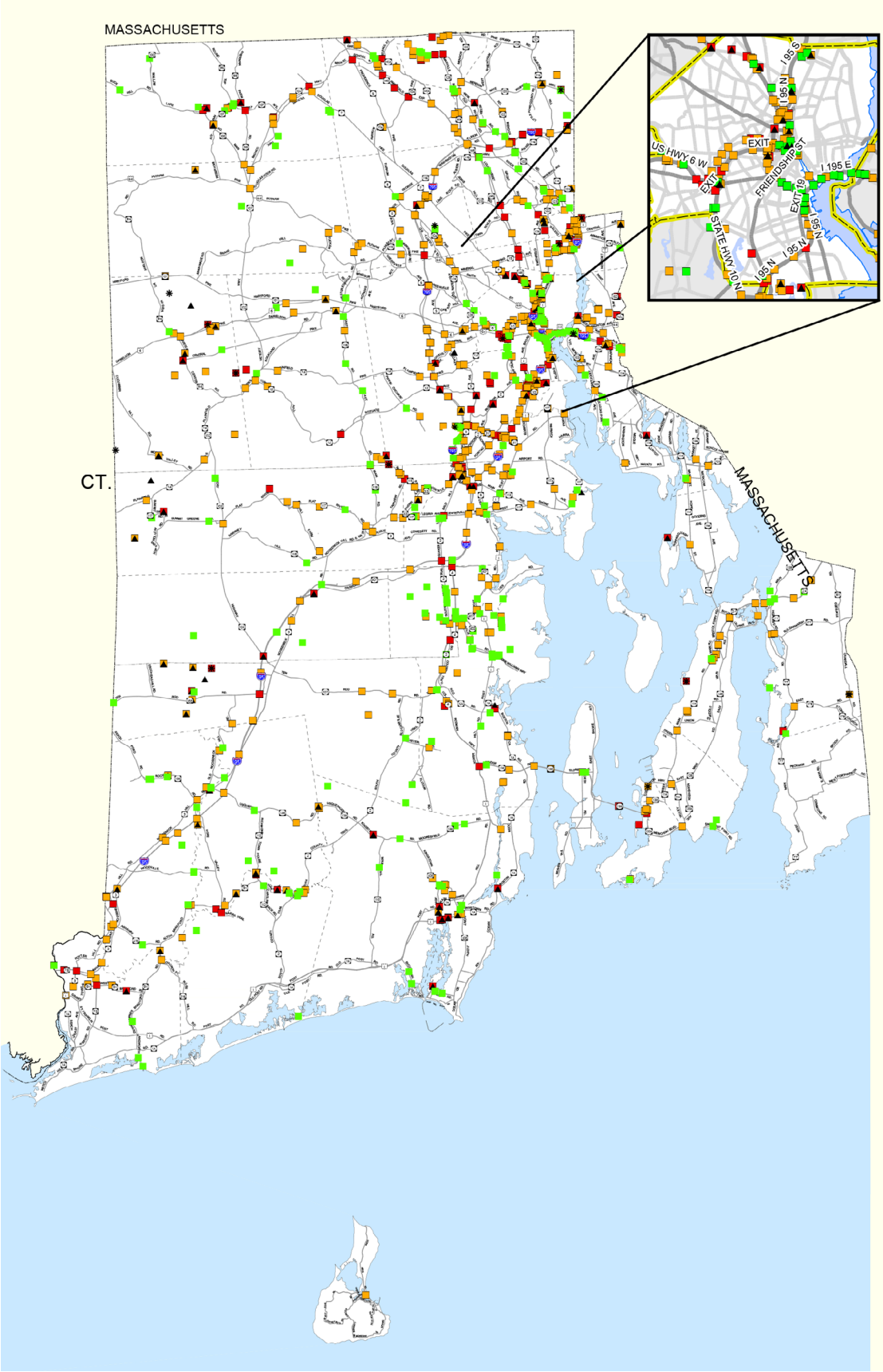
Jamestown
Jamestown Phase III and IV
Johnston
Morgan Avenue
Lincoln
Louisquisett Pike
Mussey Brook
Narragansett
Dillons Corner
Point Judith
Newport
Goat Island
North Smithfield
Main Street
Great Road
Pawtucket
Pawtucket River
Conant Street
Garden Street
George Street
Water Street
School Street
Pleasant Street
Portsmouth
Cove
Sakonnet River
Hummocks (Sakonnet)
Providence
Geneva Pond
Reservoir Avenue
Providence Viaduct SB
Orms Street
Wanskuck
Hawkins
Industrial Drive
Branch Avenue
Randall
Union Avenue
Magnolia Viaduct
Atwells Avenue Ramp (Br. 577)
Richmond
Kings Factory
Usquepaug River
Wyoming South
Scituate
Kent Dam Spillway
Smithfield
Stillwater Viaduct

South Kingstown
Usquepaug
Wakefield
Peacedale Stone Arch
Tiverton
Evans Avenue (Sakonnet)
Warwick
Apponaug Mill
Jefferson Boulevard
Barton Corner
Westerly
Potter Hill
Weekapaug
Granite Quarry
West Warwick
Natick
West Greenwich
Weaver Hill Road
Woonsocket
Hamlet Avenue

Total No. of Bridges	**114**
No. of Poor Bridges	**61**
No. of Fair Bridges	**31**
No. of Good Bridges	**18**
No. of New Bridges	**4**
Total Construction Costs	**$403,065,164**

Frenchtown Brook Bridge was replaced in just 30 days, using accelerated bridge construction methods.

Rhode Island Bridge Conditions



The condition ratings and locations of Rhode Island's 1,154 bridges. The inset shows the high concentration of bridges in and around Providence. Note in particular, the improvements shown in green along I-195 and the high number of poor condition structures (in red) along I-95. For a full breakdown of bridge conditions by community, visit www.dot.ri.gov/bridges.

- POOR BRIDGES
- FAIR BRIDGES
- GOOD BRIDGES
- POSTED BRIDGES
- CLOSED BRIDGES

Miles
0 0.5 1 2 3 4 5

Route 6/10 Interchange

The Route 6/10 Interchange must also be considered when discussing the current condition and needs of our infrastructure. This Interchange includes two of the state's most important NHS routes and is a critical link for vehicles traveling from Interstate 295, western Rhode Island, and south-central Rhode Island to downtown Providence. It is also used as an alternative to Interstate Route 95 during peak travel times.

Built for a different era, the Interchange no longer meets the needs of the traveling public in Rhode Island. The limited lane capacity of the roadways and inadequate geometry of the weaves and ramp connections result in congestion, driver delays and reduced air quality. In addition, motorists have no option to proceed westbound on Route 6 from Route 10 northbound, causing further congestion on local roadways.

The Interchange consists of 11 bridges – eight of which are more than 50 years old and in poor condition. Dating back to the 1990s, many of these structures have been strengthened by temporary shoring – a necessary measure that is now ineligible for federal funding. These bridges will continue to demand expensive emergency repairs.

Addressing this Interchange is vital to the long-term health of our state's transportation system, yet the project is currently unfunded. Only one of the NHS bridges within the Route 6/10 project area, the Magnolia Street Bridge, is being removed as part of our funded capital program.

The scope and scale of addressing the Interchange in its entirety requires a completely separate funding strategy from the Better Bridge program. Currently estimated to cost between $400 and $500 million, it dwarfs any other bridge project in Rhode Island and is approaching the scope and scale of the Iway project.

January 2014

20%

deficient bridges
in Rhode Island

42%

future trend of deficient
bridges in Rhode Island

10%

national standard
for deficient bridges

www.dot.ri.gov